LAMPIRAN 1

PENGOLAHAN DATA ANTHROPOMETRI

Uji Kenormalan Data

1. **Tinggi Bahu Berdiri (TBB)**

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7,6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{94 - 78}{7,6} = 2,11$$

Tabel Uji kenormalan data manual Tinggi Bahu Berdiri

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
< 78	< 77,995	0	0	-2,632	0,0000	0,0043	0,0043	0,430	9	6,68	0,806
78 - 80,10	77,995 - 80,105	4	-2,632	-2,066	0,0043	0,0192	0,0149	1,490			
80,11 - 82,21	80,105 - 82,215	5	-2,066	-1,500	0,0192	0,0668	0,0476	4,760			
82,22 - 84,32	82,215 - 84,325	8	-1,500	-0,933	0,0668	0,1762	0,1094	10,940	8	10,94	0,790
84,33 - 86,43	84,325 - 86,435	15	-0,933	-0,367	0,1762	0,3557	0,1795	17,950	15	17,95	0,485
86,44 - 88,54	86,435 - 88,545	22	-0,367	0,199	0,3557	0,5793	0,2236	22,360	22	22,36	0,006
88,55 - 90,65	88,545 - 90,655	20	0,199	0,765	0,5793	0,7794	0,2001	20,010	20	20,010	0,000
90,66 - 92,76	90,655 - 92,765	18	0,765	1,332	0,7794	0,9082	0,1288	12,880	18	12,88	2,035
92,77 94,87	92,765 94,875	8	1,332	1,898	0,9082	0,9713	0,0631	6,310	8	9,18	0,152
> 94,87	> 94,875	0	1,898	0	0,9713	1	0,0287	2,870			
		100						100	100	100	4,273

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{85.,65 + 88,75 + ... + 88,63}{10} = 87,803$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36}(xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(87-87{,}803)^2 + (84-87{,}803)^2 + \ldots + (91{,}5-87{,}803)^2}{100-1}}$$

$$= 3{,}7264 \approx 3{,}73$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{77{,}995 - 87{,}803}{3{,}726} = -2{,}632$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{80{,}105 - 87{,}803}{3{,}726} = -2{,}066$$

P(Z2) – P(Z1) = 0,0192– 0,0043 = 0,0149

Ei = (P(Z2) – P(Z1))* $\sum oi$ = 0,0149 * 100 = 1,49

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(9-6{,}68)^2}{6{,}68} + \ldots + \frac{(8-9{,}18)^2}{9{,}18} = 4{,}273$$

v = k – r – 1 = 7 – 2 – 1 = 4

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 4{,}273 < 9{,}49$ Data mengikuti distribusi normal

2. Panjang Sandaran (PS)

k = 1 + 3.3 log n = 1 + 3.3 log 100 = 7,6 $\approx$ 8

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{34{,}8 - 28}{7{,}6} = 0{,}895$$

Tabel Uji kenormalan data manual Panjang Sandaran

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
< 28	< 27,9995	0	0,000	-1,949	0,0000	0,0256	0,0256	2,560	6	7,93	0,470
28 - 28,894	27,9995 - 28,8945	6	-1,949	-1,413	0,0256	0,0793	0,0537	5,370			
28,895 - 29,789	28,8945 - 29,7895	13	-1,413	-0,877	0,0793	0,1894	0,1101	11,010	13	11,01	0,360
29,79 - 30,684	29,7895 - 30,6845	24	-0,877	-0,342	0,1894	0,3669	0,1775	17,750	24	17,75	2,201
30,685 - 31,579	30,6845 - 31,5795	17	-0,342	0,194	0,3669	0,5753	0,2084	20,840	17	20,84	0,708
31,58 - 32,474	31,5795 - 32,4745	15	0,194	0,729	0,5753	0,7673	0,1920	19,200	15	19,20	0,919
32,475 - 33,369	32,4745 - 33,3695	12	0,729	1,265	0,7673	0,8980	0,1307	13,070	12	13,07	0,088
33,37 - 34,264	33,3695 - 34,2645	7	1,265	1,800	0,8980	0,9641	0,0661	6,610	13	10,20	0,769
34,265 35,159	34,2645 - 35,1595	6	1,800	2,336	0,9641	0,9904	0,0263	2,630			
> 35,159	> 35,1595	0	2,336	0,000	0,9904	1	0,0096	0,960			
		100						100	100	100	5,513

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{32{,}11 + 31{,}53 + \ldots + 31{,}93}{10} = 31{,}256$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(31 - 31{,}256)^2 + (32{,}5 - 31{,}256)^2 + \ldots + (34{,}5 - 31{,}256)^2}{100 - 1}}$$

$$= 1{,}671$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{27{,}9995 - 31{,}256}{1{,}671} = -1{,}949$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{28{,}8945 - 31{,}256}{1{,}671} = -1{,}413$$

$P(Z2) - P(Z1) = 0{,}0793 - 0{,}0256 = 0{,}0537$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0537 * 100 = 5{,}37$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(6 - 7{,}93)^2}{7{,}93} + \ldots + \frac{(13 - 10{,}2)^2}{10{,}2} = 5{,}513$$

$v = k - r - 1 = 7 - 2 - 1 = 4$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 5{,}513 < 9{,}49$ Data mengikuti distribusi normal

3. Tinggi Popliteal (TPO)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{33 - 28}{7{,}6} = 0{,}6579 \approx 0{,}658$$

Tabel Uji kenormalan data manual Tinggi Popliteal

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
< 28	< 27,9995	0	0	-2,1395	0,0000	0,0162	0,0162	1,620	6	5,94	0,001
28 - 28,657	27,9995 - 28,6575	6	-2,1395	-1,5567	0,0162	0,0594	0,0432	4,320			
28,658 - 29,315	28,6575 - 29,3155	10	-1,5567	-0,9739	0,0594	0,1660	0,1066	10,660	10	10,66	0,041
29,316 - 29,973	29,3155 - 29,9735	18	-0,9739	-0,3911	0,1660	0,3483	0,1823	18,230	18	18,23	0,003
29,974 - 30,631	29,9735 - 30,6315	24	-0,3911	0,1918	0,3483	0,5753	0,2270	22,700	24	22,70	0,074
30,632 - 31,289	30,6315 - 31,2895	17	0,1918	0,7746	0,5753	0,7823	0,2070	20,700	17	20,70	0,661
31,29 - 31,947	31,2895 - 31,9475	11	0,7746	1,3574	0,7823	0,9131	0,1308	13,080	11	13,08	0,331
31,948 - 32,605	31,9475 - 32,6055	13	1,3574	1,9402	0,9131	0,9738	0,0607	6,070			
32,606 33,263	32,6055 - 33,2635	1	1,9402	2,523	0,9738	0,9941	0,0203	2,030	14	8,69	3,245
> 33,263	>33,2635	0	2,5230	0	0,9941	1	0,0059	0,590			
		100						100	100,00	100,00	4,356

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{30,31 + 31,1 + ... + 30,32}{10} = 30,415$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(29.5 - 30,415)^2 + (31,5 - 30,415)^2 + ... + (29.6 - 30,415)^2}{100-1}}$$

$$= 1,129$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{27,9995 - 30,415}{1,129} = -2,14$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{28{,}6575 - 30{,}415}{1{,}129} = -1{,}557$$

$P(Z2) - P(Z1) = 0{,}0594 - 0{,}0162 = 0{,}0432$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0432 * 100 = 4{,}32$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(6 - 5{,}94)^2}{5{,}94} + \ldots + \frac{(14 - 8{,}69)^2}{8{,}69} = 4{,}356$$

$v = k - r - 1 = 7 - 2 - 1 = 4$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 4{,}356 < 9{,}49$ Data mengikuti distribusi normal

4. Pantat Popliteal (PPO)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7,6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{33,5 - 27}{7,6} = 0,855$$

Tabel Uji kenormalan data manual Pantat Popliteal

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
< 27	< 26,9995	0	0	-2,150	0,0000	0,0158	0,0158	1,580	7	5,26	0,576
27 - 27,854	26,9995 - 27,8545	7	-2,150	-1,624	0,0158	0,0526	0,0368	3,680			
27,855 - 28,709	27,8545 - 28,7095	9	-1,624	-1,098	0,0526	0,1357	0,0831	8,310	9	8,31	0,057
28,71 - 29,564	28,7095 - 29,5645	13	-1,098	-0,572	0,1357	0,2843	0,1486	14,860	13	14,86	0,233
29,565 - 30,419	29,5645 - 30,4195	24	-0,572	-0,046	0,2843	0,4801	0,1958	19,580	24	19,58	0,998
30,42 - 31,274	30,4195 - 31,2745	15	-0,046	0,480	0,4801	0,6844	0,2043	20,430	15	20,43	1,443
31,275 - 32,129	31,2745 - 32,1295	16	0,480	1,006	0,6844	0,8438	0,1594	15,940	16	15,94	0,000
32,13 - 32,984	32,1295 - 32,9845	10	1,006	1,533	0,8438	0,9370	0,0932	9,320	10	9,320	0,050
32,985 33,839	32,9845 - 33,8395	6	1,533	2,059	0,9370	0,9803	0,0433	4,330	6	6,30	0,014
> 33,839	>33,8395	0	2,059	0	0,9803	1	0,0197	1,970			
		100						100	100	100	3,371

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{30,84 + 29,87 + ... + 30,59}{10} = 30,494$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(29,8 - 30,494)^2 + (30 - 30,494)^2 + ... + (33 - 30,494)^2}{100 - 1}}$$

$$= 1,625$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{26{,}9995 - 30{,}494}{1{,}625} = -2{,}15$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{27{,}8545 - 30{,}415}{1{,}129} = -1{,}624$$

$P(Z2) - P(Z1) = 0{,}0526 - 0{,}0158 = 0{,}0368$

$Ei = (P(Z2) - P(Z1))^* \sum oi = 0{,}0368 * 100 = 3{,}68$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(7 - 5{,}26)^2}{5{,}26} + \ldots + \frac{(6 - 6{,}3)^2}{6{,}3} = 3{,}371$$

$v = k - r - 1 = 8 - 2 - 1 = 5$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 11{,}07$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 3{,}371 < 11{,}07$ Data mengikuti distribusi normal

5. Tebal Paha (TP)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{11 - 7{,}5}{7{,}6} = 0{,}4605 \approx 0{,}461$$

Tabel Uji kenormalan data manual Tebal Paha

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
< 7,5	< 7,4995	0	0	-1,696	0,0000	0,0446	0,0446	4,460	12	10,93	0,105
7,5 · 7,960	7,4995 · 7,9605	12	-1,696	-1,233	0,0446	0,1093	0,0647	6,470			
7,961 - 8,421	7,9605 - 8,4215	12	-1,233	-0,771	0,1093	0,2206	0,1113	11,130	12	11,13	0,068
8,422 - 8,882	8,4215 - 8,8825	10	-0,771	-0,308	0,2206	0,3783	0,1577	15,770	10	15,77	2,111
8,883 - 9,343	8,8825 - 9,3435	20	-0,308	0,155	0,3783	0,5636	0,1853	18,530	20	18,53	0,117
9,344 - 9,804	9,3435 - 9,8045	16	0,155	0,618	0,5636	0,7324	0,1688	16,880	16	16,88	0,046
9,805 - 10,265	9,8045 - 10,2655	14	0,618	1,081	0,7324	0,8599	0,1275	12,750	14	12,75	0,123
10,266 - 10,726	10,2655 - 10,7265	9	1,081	1,544	0,8599	0,9382	0,0783	7,830	9	7,830	0,175
10,727 11,187	10,7265 11,1875	7	1,544	2,007	0,9382	0,9778	0,0396	3,960	7	6,180	0,109
> 11,187	>11,1875	0	2,007	0	0,9778	1	0,0222	2,220			
		100						100	100	100	2,853

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{9,02 + 9,39 + ... + 9,14}{10} = 9.189$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(8-9,189)^2 + (7,5-9,189)^2 + ... + (9-9,189)^2}{100-1}}$$

$$= 0,996$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{7,4995 - 9,189}{0,996} = -1,696$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{7{,}9605 - 9{,}189}{0{,}996} = -1{,}233$$

$P(Z2) - P(Z1) = 0{,}1093 - 0{,}0446 = 0{,}0647$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0647 * 100 = 6{,}47$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(12 - 10{,}93)^2}{5{,}26} + \ldots + \frac{(7 - 6{,}18)^2}{6{,}18} = 2{,}853$$

$v = k - r - 1 = 8 - 2 - 1 = 5$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 11{,}07$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 2{,}853 < 11{,}07$ Data mengikuti distribusi normal

6. Lebar Pinggul (LP)

k = 1 + 3.3 log n = 1 + 3.3 log 100 = 7,6 ≈ 8

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{34 - 28}{7,6} = 0,7895 \approx 0,79$$

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
< 28	< 27,995	0		-1,830	0,0000	0,3360	0,3360	33,600	7	9,34	0,586
28 - 28,78	27,995 - 28,785	7	-1,830	-1,317	0,3360	0,0934	-0,2426	-24,260			
28,79 - 29,57	28,785 - 29,575	15	-1,317	-0,804	0,0934	0,2119	0,1185	11,850	15	11,85	0,837
29,58 - 30,36	29,575 - 30,365	17	-0,804	-0,291	0,2119	0,3859	0,1740	17,400	17	17,40	0,009
30,37 - 31,15	30,365 - 31,155	23	-0,291	0,222	0,3859	0,5871	0,2012	20,120	23	20,12	0,412
31,16 - 31,94	31,155 - 31,945	13	0,222	0,735	0,5871	0,7704	0,1833	18,330	13	18,33	1,550
31,95 - 32,73	31,945 - 32,735	11	0,735	1,248	0,7704	0,8944	0,1240	12,400	11	12,40	0,158
32,74 - 33,52	32,735 - 33,525	9	1,248	1,761	0,8944	0,9608	0,0664	6,640			
33,53 34,31	33,525 34,315	5	1,761	2,274	0,9608	0,9884	0,0276	2,760	14	10,560	1,121
>34,31	>34,315	0	2,274		0,9884	1	0,0116	1,160			
		100						100	100,00	100,00	4,674

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{30,74 + 30,58 + ... + 31,26}{10} = 30,813$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(29,5 - 30,813)^2 + (29,5 - 30,813)^2 + ... + (30,5 - 30,813)^2}{100 - 1}}$$

$$= 1,54$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{27{,}995 - 30{,}813}{1{,}54} = -1{,}83$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{28{,}785 - 30{,}813}{1{,}54} = -1{,}317$$

$P(Z2) - P(Z1) = 0{,}0934 - 0{,}336 = -0{,}2426$

$Ei = (P(Z2) - P(Z1)) * \sum oi = -0{,}2426 * 100 = -24{,}26$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(7 - 9{,}34)^2}{9{,}34} + \ldots + \frac{(14 - 10{,}56)^2}{10{,}56} = 4{,}674$$

$v = k - r - 1 = 7 - 2 - 1 = 4$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 4{,}674 < 9{,}49$ Data mengikuti distribusi normal

7. Tinggi Siku Duduk (TSD)

k = 1 + 3.3 log n = 1 + 3.3 log 100 = 7,6 ≈ 8

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{23{,}2 - 14{,}5}{7{,}6} = 1{,}1447 \approx 1{,}145$$

Tabel Uji kenormalan data manual Tinggi Siku Duduk

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
< 14,5	< 14,4995	0		-2,795	0,0000	0,0026	0,0026	0,26	6	5,71	0,015
14,5 - 15,644	14,4995 - 15,6445	3	-2,795	-2,186	0,0026	0,0143	0,0117	1,17			
15,645 - 16,789	15,6445 - 16,7895	3	-2,186	-1,578	0,0143	0,0571	0,0428	4,28			
16,79 - 17,934	16,7895 - 17,9345	9	-1,578	-0,969	0,0571	0,1660	0,1089	10,89	9	10,89	0,328
17,935 - 19,079	17,9345 - 19,0795	22	-0,969	-0,361	0,1660	0,3594	0,1934	19,34	22	19,34	0,366
19,08 - 20,224	19,0795 - 20,2245	21	-0,361	0,247	0,3594	0,5987	0,2393	23,93	21	23,93	0,359
20,225 - 21,369	20,2245 - 21,3695	19	0,247	0,856	0,5987	0,8051	0,2064	20,64	19	20,64	0,130
21,37 - 22,514	21,3695 - 22,5145	17	0,856	1,464	0,8051	0,9278	0,1227	12,27	17	12,27	1,823
22,515 23,659	22,5145 23,6595	6	1,464	2,073	0,9278	0,9808	0,0530	5,30	6	7,22	0,206
>23,659	>23,6595	0	2,073		0,9808	1	0,0192	1,92			
		100						100	100	100	3,227

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{19{,}81 + 19{,}49 + \ldots + 19{,}64}{10} = 19{,}759$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36}(xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(16{,}5 - 19{,}759)^2 + (23{,}2 - 19{,}759)^2 + ... + (19{,}3 - 19{,}759)^2}{100-1}}$$

$$= 1{,}882$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{14{,}4995 - 19{,}759}{1{,}882} = -2{,}795$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{15{,}6445 - 19{,}759}{1{,}882} = -2{,}186$$

$P(Z2) - P(Z1) = 0{,}0143 - 0{,}0026 = 0{,}0117$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0117 * 100 = 1{,}17$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(6 - 5{,}71)^2}{5{,}71} + ... + \frac{(6 - 7{,}22)^2}{7{,}22} = 3{,}227$$

$v = k - r - 1 = 7 - 2 - 1 = 4$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 3{,}227 < 9{,}49$ Data mengikuti distribusi normal

8. Tinggi Mata Duduk (TMD)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{56 - 41{,}5}{7{,}6} = 1{,}9079 \approx 1{,}908$$

Tabel Uji kenormalan data manual Tinggi Mata Duduk

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
< 41,5	< 41,4995	0		-2,225	0,0000	0,0129	0,0129	1,290	4	5,94	0,634
41,5 - 43,407	41,4995 - 43,4075	4	-2,225	-1,557	0,0129	0,0594	0,0465	4,650			
43,408 - 45,315	43,4075 - 45,3155	17	-1,557	-0,888	0,0594	0,1867	0,1273	12,730	17	12,73	1,432
45,316 - 47,223	45,3155 - 47,2235	20	-0,888	-0,220	0,1867	0,4129	0,2262	22,620	20	22,62	0,303
47,224 - 49,131	47,2235 - 49,1315	25	-0,220	0,449	0,4129	0,6736	0,2607	26,070	25	26,07	0,044
49,132 - 51,039	49,1315 - 51,0395	26	0,449	1,117	0,6736	0,8810	0,2074	20,740	26	20,74	1,334
51,04 - 52,947	51,0395 - 52,9475	4	1,117	1,786	0,8810	0,9633	0,0823	8,230	8	11,90	1,278
52,948 - 54,855	52,9475 - 54,8555	1	1,786	2,454	0,9633	0,9929	0,0296	2,960			
54,856 56,763	54,8555 56,7635	3	2,454	3,123	0,9929	0,9991	0,0062	0,620			
>56,763	>56,7635	0	3,123		0,9991	1	0,0009	0,090			
		100						100	100	100	5,025

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{48{,}05 + 48{,}03 + \ldots + 48{,}04}{10} = 47{,}851$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(44{,}5 - 47{,}851)^2 + (48 - 47{,}851)^2 + \ldots + (48 - 47{,}851)^2}{100 - 1}}$$

$$= 2{,}854$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{41{,}4995 - 47{,}851}{2{,}854} = -2{,}225$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{43{,}4075 - 47{,}851}{2{,}854} = -1{,}557$$

$P(Z2) - P(Z1) = 0{,}0594 - 0{,}0129 = 0{,}0465$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0465 * 100 = 4{,}65$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(4 - 5{,}94)^2}{5{,}94} + \ldots + \frac{(8 - 11{,}9)^2}{11{,}9} = 5{,}025$$

$v = k - r - 1 = 6 - 2 - 1 = 3$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 7{,}81$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 5{,}025 < 7{,}81$ Data mengikuti distribusi normal

9. Tinggi Badan Tegak (TBT)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{123 - 101}{7{,}6} = 2{,}8947 \approx 2{,}895$$

Tabel Uji kenormalan data manual Tinggi Badan Tegak

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
< 101	< 100,9995	0		-2,461	0,0000	0,0069	0,0069	0,690			
101 - 103,894	100,9995 - 103,8945	4	-2,461	-1,834	0,0069	0,0336	0,0267	2,670	12	11,31	0,042
103,895 - 106,789	103,8945 - 106,7895	8	-1,834	-1,206	0,0336	0,1131	0,0795	7,950			
106,79 - 109,684	106,7895 - 109,6845	11	-1,206	-0,579	0,1131	0,2810	0,1679	16,790	11	16,79	1,997
109,685 - 112,579	109,6845 - 112,5795	28	-0,579	0,049	0,2810	0,5199	0,2389	23,890	28	23,89	0,707
112,58 - 115,474	112,5795 - 115,4745	26	0,049	0,676	0,5199	0,7517	0,2318	23,180	26	23,18	0,343
115,475 - 118,369	115,4745 - 118,3695	14	0,676	1,304	0,7517	0,9082	0,1565	15,650	23	15,65	3,452
118,37 - 121,264	118,3695 - 121,2645	5	1,304	1,931	0,9082	0,9732	0,0650	6,500			
121,265 124,159	121,2645 124,1595	4	1,931	2,558	0,9732	0,9948	0,0216	2,160	9	9,180	0,004
>124,159	>124,1595	0	2,558		0,9948	1	0,0052	0,520			
		100						100	109,00	100,00	6,544

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{111{,}85 + 112{,}9 + ... + 110{,}4}{10} = 112{,}355$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(113 - 112{,}355)^2 + (106 - 112{,}355)^2 + ... + (110{,}2 - 112{,}355)^2}{100-1}}$$ Z1 =

$$= 4{,}614$$

$$\frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{100{,}9995 - 112{,}355}{4{,}614} = -2{,}461$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{103{,}8945 - 112{,}355}{4{,}614} = -1{,}834$$

$P(Z2) - P(Z1) = 0{,}0336 - 0{,}0069 = 0{,}0267$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0267 * 100 = 2{,}67$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(12 - 11{,}31)^2}{11{,}31} + \ldots + \frac{(9 - 9{,}18)^2}{9{,}18} = 6{,}544$$

$v = k - r - 1 = 6 - 2 - 1 = 3$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 7{,}81$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 6{,}544 < 7{,}81$ Data mengikuti distribusi normal

10. Tinggi Bahu Duduk (TBD)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{42{,}5 - 32}{7{,}6} = 1{,}3816$$

Tabel Uji kenormalan data manual Tinggi Bahu Duduk

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
<32	< 31,9995	0		-1,803		0,0359	0,0359	3,590	14	12,30	0,235
32 - 33,381	31,9995 - 33,3815	14	-1,803	-1,159	0,0359	0,1230	0,0871	8,710			
33,382 - 34,763	33,3815 - 34,7635	16	-1,159	-0,514	0,1230	0,3050	0,1820	18,200	16	18,20	0,266
34,764 - 36,145	34,7635 - 36,1455	31	-0,514	0,130	0,3050	0,5517	0,2467	24,670	31	24,67	1,624
36,146 - 37,527	36,1455 - 37,5275	17	0,130	0,775	0,5517	0,7823	0,2306	23,060	17	23,06	1,593
37,528 - 38,909	37,5275 - 38,9095	12	0,775	1,419	0,7823	0,9222	0,1399	13,990	12	13,99	0,283
38,91 - 40,291	38,9095 - 40,2915	7	1,419	2,064	0,9222	0,9803	0,0581	5,810	10	7,78	0,633
40,292 - 41,673	40,2915 - 41,6735	1	2,064	2,708	0,9803	0,9966	0,0163	1,630			
41,674 43,055	41,6735 43,0555	2	2,708	3,352	0,9966	0,9996	0,0030	0,300			
>43,055	>43,0555	0	3,352		0,9996	1	0,0004	0,040			
		100						100	100	100	4,634

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{35{,}44 + 35{,}85 + ... + 35{,}68}{10} = 35{,}866$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(33 - 35{,}866)^2 + (33{,}5 - 35{,}866)^2 + ... + (38 - 35{,}866)^2}{100 - 1}}$$

$$= 2{,}1445$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{31{,}9995 - 35{,}866}{2{,}1445} = -1{,}803$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{33{,}3815 - 35{,}866}{2{,}1445} = -1{,}159$$

$P(Z2) - P(Z1) = 0{,}1230 - 0{,}0359 = 0{,}0871$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0871 * 100 = 8{,}71$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(14 - 12{,}30)^2}{12{,}30} + \ldots + \frac{(10 - 7{,}78)^2}{7{,}78} = 4{,}634$$

$v = k - r - 1 = 6 - 2 - 1 = 3$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 7{,}81$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 4{,}634 < 7{,}81$ Data mengikuti distribusi normal

11. Tinggi Lutut (TL)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{36{,}5 - 28{,}5}{7{,}6} = 1{,}0526 \approx 1{,}053$$

Tabel Uji kenormalan data manual Tinggi Lutut

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
<28,5	< 28,4995	0		-1,989	0,0000	0,0233	0,0233	2,330	10	7,78	0,633
28,5 - 29,552	28,4995 - 29,5525	10	-1,989	-1,418	0,0233	0,0778	0,0545	5,450			
29,553 - 30,605	29,5525 - 30,6055	13	-1,418	-0,848	0,0778	0,1977	0,1199	11,990	13	11,99	0,085
30,606 - 31,658	30,6055 - 31,6585	17	-0,848	-0,277	0,1977	0,3897	0,1920	19,200	17	19,20	0,252
31,659 - 32,711	31,6585 - 32,7115	19	-0,277	0,293	0,3897	0,6141	0,2244	22,440	19	22,44	0,527
32,712 - 33,764	32,7115 - 33,7645	23	0,293	0,864	0,6141	0,8051	0,1910	19,100	23	19,10	0,796
33,765 - 34,817	33,7645 - 34,8175	7	0,864	1,435	0,8051	0,9251	0,1200	12,000	7	12,00	2,083
34,818 - 35,870	34,8175 - 35,8705	6	1,435	2,005	0,9251	0,9778	0,0527	5,270			
35,871 36,923	35,8705 36,9235	5	2,005	2,576	0,9778	0,9951	0,0173	1,730	11	7,490	1,645
>36,923	>36,9235	0	2,576		0,9951	1	0,0049	0,490			
		100						100	100	100	6,023

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{32 + 31{,}95 + ... + 32{,}45}{10} = 32{,}17$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(30-32{,}17)^2 + (33-32{,}17)^2 + ... + (32{,}5-32{,}17)^2}{100-1}}$$

$$= 1{,}845$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{28{,}4995 - 32{,}17}{1{,}845} = -1{,}989$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{29{,}5525 - 32{,}17}{1{,}845} = -1{,}418$$

$P(Z2) - P(Z1) = 0{,}0778 - 0{,}0233 = 0{,}0545$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0545 * 100 = 5{,}45$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(10 - 7{,}78)^2}{7{,}78} + \ldots + \frac{(11 - 7{,}49)^2}{7{,}49} = 6{,}023$$

$v = k - r - 1 = 7 - 2 - 1 = 4$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 6{,}023 < 9{,}49$ Data mengikuti distribusi normal

12. Tinggi Siku Berdiri (TSB)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{74 - 62}{7{,}6} = 1{,}5789 \approx 1{,}579$$

Tabel Uji kenormalan data manual Tinggi Siku Berdiri

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
<62	< 61,9995	0		-2,137	0,0000	0,0162	0,0162	1,620	4	5,59	0,452
62 - 63,578	61,9995 - 63,5785	4	-2,137	-1,588	0,0162	0,0559	0,0397	3,970			
63,579 - 65,157	63,5785 - 65,1575	16	-1,588	-1,040	0,0559	0,1492	0,0933	9,330	16	9,33	4,768
65,158 - 66,736	65,1575 - 66,7365	16	-1,040	-0,492	0,1492	0,3121	0,1629	16,290	16	16,29	0,005
66,737 - 68,315	66,7365 - 68,3155	18	-0,492	0,056	0,3121	0,5239	0,2118	21,180	18	21,18	0,477
68,316 - 69,894	68,3155 - 69,8945	15	0,056	0,605	0,5239	0,7291	0,2052	20,520	15	20,52	1,485
69,895 - 71,473	69,8945 - 71,4735	14	0,605	1,153	0,7291	0,8749	0,1458	14,580	14	14,58	0,023
71,474 - 73,052	71,4735 - 73,0525	13	1,153	1,701	0,8749	0,9554	0,0805	8,050	17	12,510	1,612
73,053 74,631	73,0525 74,6315	4	1,701	2,250	0,9554	0,9878	0,0324	3,240			
>74,631	>74,6315	0	2,250		0,9878	1	0,0122	1,220			
		100						100	100	100	8,823

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{68{,}28 + 68{,}1 + \ldots + 66{,}98}{10} = 68{,}153$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(69 - 68{,}153)^2 + (66 - 68{,}153)^2 + \ldots + (66 - 68{,}153)^2}{100 - 1}}$$

$$= 2{,}879$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{61{,}9995 - 68{,}153}{2{,}879} = -2{,}137$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{63{,}5785 - 68{,}153}{2{,}879} = -1{,}588$$

$P(Z2) - P(Z1) = 0{,}0559 - 0{,}0162 = 0{,}0397$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0397 * 100 = 3{,}97$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(4 - 5{,}59)^2}{5{,}59} + \ldots + \frac{(17 - 12{,}51)^2}{12{,}51} = 8{,}823$$

$v = k - r - 1 = 7 - 2 - 1 = 4$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 8{,}823 < 9{,}49$ Data mengikuti distribusi normal

13. Jangkauan Tangan (JT)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{52 - 40}{7{,}6} = 1{,}5789 \approx 1{,}579$$

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
<40	< 39,9995	0		-2,020	0,0000	0,0217	0,0217	2,170	8	7,35	0,057
40 · 41,578	39,9995 - 41,5785	8	-2,020	-1,452	0,0217	0,0735	0,0518	5,180			
41,579 - 43,157	41,5785 - 43,1575	12	-1,452	-0,884	0,0735	0,1894	0,1159	11,590	12	11,59	0,015
43,158 - 44,736	43,1575 - 44,7365	16	-0,884	-0,315	0,1894	0,3745	0,1851	18,510	16	18,51	0,340
44,737 - 46,315	44,7365 - 46,3155	25	-0,315	0,253	0,3745	0,5987	0,2242	22,420	25	22,42	0,297
46,316 - 47,894	46,3155 - 47,8945	16	0,253	0,821	0,5987	0,7939	0,1952	19,520	16	19,52	0,635
47,895 - 49,473	47,8945 - 49,4735	14	0,821	1,389	0,7939	0,9177	0,1238	12,380	14	12,38	0,212
49,474 · 51,052	49,4735 - 51,0525	7	1,389	1,958	0,9177	0,9750	0,0573	5,730			
51,053 52,631	51,0525 52,6315	2	1,958	2,318	0,9750	0,9898	0,0148	1,480	9	8,230	0,072
>52,631	>52,6315	0	2,318		0,9898	1	0,0102	1,020			
		100						100	100,00	100,00	1,628

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{45,4 + 45,53 + ... + 45,6}{10} = 45,613$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(51-45,613)^2 + (41-45,613)^2 + ... + (40,5-45,613)^2}{100-1}}$$

$$= 2,778$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{39,9995 - 45,613}{2,778} = -2,020$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{41{,}5785 - 45{,}613}{2{,}778} = -1{,}452$$

$P(Z2) - P(Z1) = 0{,}0735 - 0{,}0217 = 0{,}0518$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0518 * 100 = 5{,}18$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(8 - 7{,}35)^2}{7{,}35} + \ldots + \frac{(9 - 8{,}23)^2}{8{,}23} = 1{,}628$$

$v = k - r - 1 = 7 - 2 - 1 = 4$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 1{,}628 < 9{,}49$ Data mengikuti distribusi normal

14. Tinggi Duduk Tegak (TDT)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{66 - 50}{7{,}6} = 2{,}10526 \approx 2{,}105$$

Tabel Uji kenormalan data manual Tinggi Siku Berdiri

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
<50	< 49,9995	0		-2,070	0,0000	0,0192	0,0192	1,920	7	5,94	0,189
50 - 52,104	49,9995 - 52,1045	7	-2,070	-1,563	0,0192	0,0594	0,0402	4,020			
52,105 - 54,209	52,1045 - 54,2095	12	-1,563	-1,056	0,0594	0,1446	0,0852	8,520	12	8,52	1,421
54,21 - 56,314	54,2095 - 56,3145	12	-1,056	-0,550	0,1446	0,2912	0,1466	14,660	12	14,66	0,483
56,315 - 58,419	56,3145 - 58,4195	15	-0,550	-0,043	0,2912	0,4840	0,1928	19,280	15	19,28	0,950
58,42 - 60,524	58,4195 - 60,5245	24	-0,043	0,464	0,4840	0,6772	0,1932	19,320	24	19,32	1,134
60,525 - 62,629	60,5245 - 62,6295	11	0,464	0,971	0,6772	0,8340	0,1568	15,680	11	15,68	1,397
62,63 - 64,734	62,6295 - 64,7345	10	0,971	1,477	0,8340	0,9306	0,0966	9,660	10	9,660	0,012
64,735 66,839	64,7345 66,8395	9	1,477	1,984	0,9306	0,9761	0,0455	4,550	9	6,940	0,611
>66,839	>66,8395	0	1,984		0,9761	1	0,0239	2,390			
		100						100	100	100	6,197

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{58.95 + 58.9 + ... + 58.26}{10} = 58{,}598$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(55 - 58{,}598)^2 + (59 - 58{,}598)^2 + ... + (61{,}5 - 58{,}598)^2}{100 - 1}}$$

$$= 4{,}154$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{49{,}9995 - 58{,}598}{4{,}154} = -2{,}070$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{52{,}1045 - 58{,}598}{4{,}154} = -1{,}563$$

$P(Z2) - P(Z1) = 0{,}0594 - 0{,}0192 = 0{,}0402$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0402 * 100 = 4{,}02$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(7 - 5{,}94)^2}{5{,}94} + \ldots + \frac{(9 - 6{,}94)^2}{6{,}94} = 6{,}197$$

$v = k - r - 1 = 8 - 2 - 1 = 5$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 11{,}07$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 6{,}197 < 11{,}07$ Data mengikuti distribusi normal

15. Lebar Bahu (LB)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{36{,}8 - 28{,}8}{7{,}6} = 1{,}0526 \approx 1{,}053$$

Tabel Uji kenormalan data manual Lebar Bahu

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
<28.8	< 28.7995	0		-1,902	0,0000	0,0287	0,0287	2,870	8	8,23	0,006
28,8 - 29,852	28,7995 - 29,8525	8	-1,902	-1,385	0,0287	0,0823	0,0536	5,360			
29,853 - 30,905	29,8525 - 30,9055	14	-1,385	-0,868	0,0823	0,1922	0,1099	10,990	14	10,99	0,824
30,906 - 31,958	30,9055 - 31,9585	17	-0,868	-0,350	0,1922	0,3821	0,1899	18,990	17	18,99	0,209
31,959 - 33,011	31,9585 - 33,0115	23	-0,350	0,167	0,3821	0,5675	0,1854	18,540	23	18,54	1,073
33,012 - 34,064	33,0115 - 34,0645	15	0,167	0,685	0,5675	0,7549	0,1874	18,740	15	18,74	0,746
34,065 - 35,117	34,0645 - 35,1175	10	0,685	1,202	0,7549	0,8849	0,1300	13,000	10	13,00	0,692
35,118 - 36,170	35,1175 - 36,1705	9	1,202	1,720	0,8849	0,9573	0,0724	7,240	13	11,510	0,193
36,171 37,223	36,1705 37,2235	4	1,720	2,237	0,9573	0,9875	0,0302	3,020			
>37.223	>37.2235	0	2,237		0,9875	1	0,0125	1,250			
		100						100	100	100	3,744

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{32,62 + 32,79 + ... + 32,49}{10} = 32,671$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(30 - 32,671)^2 + (36,7 - 32,671)^2 + ... + (30 - 32,671)^2}{100-1}}$$

$$= 2,035$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{28.7995 - 32,671}{2,035} = -1,902$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{29{,}8525 - 32{,}671}{2{,}035} = -1{,}385$$

$P(Z2) - P(Z1) = 0{,}0823 - 0{,}0287 = 0{,}0536$

$Ei = (P(Z2) - P(Z1))^* \sum oi = 0{,}0536 * 100 = 5{,}3636$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(8 - 8{,}23)^2}{8{,}23} + \ldots + \frac{(13 - 11{,}51)^2}{11{,}51} = 3{,}744$$

$v = k - r - 1 = 7 - 2 - 1 = 4$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 3{,}744 < 9{,}49$ Data mengikuti distribusi normal

16. Lebar Sandaran (LS)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{16 - 9}{7{,}6} = 0{,}921$$

Tabel Uji kenormalan data manual Lebar Sandaran

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
<9	< 8.9995	0		-1,803	0,0000	0,0359	0,0359	3,590	6	9,34	1,194
9 - 9,920	8,9995 - 9,9205	6	-1,803	-1,320	0,0359	0,0934	0,0575	5,750			
9,921 - 10,841	9,9205 - 10,8415	14	-1,320	-0,838	0,0934	0,2005	0,1071	10,710	14	10,71	1,011
10,842 - 11,762	10,8415 - 11,7625	18	-0,838	-0,356	0,2005	0,3594	0,1589	15,890	18	15,89	0,280
11,763 - 12,683	11,7625 - 12,6835	24	-0,356	0,126	0,3594	0,5517	0,1923	19,230	24	19,23	1,183
12,684 - 13,604	12,6835 - 13,6045	11	0,126	0,609	0,5517	0,7291	0,1774	17,740	11	17,74	2,561
13,605 - 14,525	13,6045 - 14,5255	10	0,609	1,091	0,7291	0,8621	0,1330	13,300	10	13,30	0,819
14,526 - 15,446	14,5255 - 15,4465	9	1,091	1,573	0,8621	0,9418	0,0797	7,970	9	7,970	0,133
15,447 16,367	15,4465 16,3675	8	1,573	2,055	0,9418	0,9803	0,0385	3,850	8	5,820	0,817
>16.367	>16.3675	0	2,055		0,9803	1	0,0197	1,970			
		100						100	100,00	100,00	7,998

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{12,55 + 12,5 + ... + 12,45}{10} = 12,442$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(13,5 - 12,442)^2 + (14 - 12,442)^2 + ... + (11 - 12,442)^2}{100-1}}$$

$$= 1,9098$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{8,9995 - 12,442}{1,9098} = -1,803$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{9{,}9205 - 12{,}442}{1{,}9098} = -1{,}32$$

$P(Z2) - P(Z1) = 0{,}0934 - 0{,}0359 = 0{,}0575$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0575 * 100 = 5{,}75$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(6 - 9{,}34)^2}{9{,}34} + \ldots + \frac{(8 - 5{,}82)^2}{5{,}82} = 7{,}998$$

$v = k - r - 1 = 8 - 2 - 1 = 5$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 11{,}07$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 7{,}998 < 11{,}07$ Data mengikuti distribusi normal

17. Lebar Tangan (LT)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{66 - 50}{7{,}6} = 2{,}10526 \approx 2{,}105$$

Tabel Uji kenormalan data manual Lebar Tangan

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
<4.5	<4.4995	0		-1,947	0,0000	0,0256	0,0256	2,560	8	7,93	0,001
4,5 - 4,894	4,4995 - 4,8945	8	-1,947	-1,414	0,0256	0,0793	0,0537	5,370			
4,895 - 5,289	4,8945 - 5,2895	12	-1,414	-0,881	0,0793	0,1894	0,1101	11,010	12	11,01	0,089
5,29 - 5,684	5,2895 - 5,6845	14	-0,881	-0,349	0,1894	0,3632	0,1738	17,380	14	17,38	0,657
5,685 - 6,079	5,6845 - 6,0795	27	-0,349	0,184	0,3632	0,5714	0,2082	20,820	27	20,82	1,834
6,08 - 6,474	6,0795 - 6,4745	14	0,184	0,717	0,5714	0,7642	0,1928	19,280	14	19,28	1,446
6,475 - 6,869	6,4745 - 6,8695	12	0,717	1,250	0,7642	0,8944	0,1302	13,020	12	13,02	0,080
6,87 - 7,264	6,8695 - 7,2645	10	1,250	1,782	0,8944	0,9625	0,0681	6,810			
7,265 7,659	7,2645 7,6595	3	1,782	2,315	0,9625	0,9898	0,0273	2,730	13	10,560	0,564
>7.659	>7.6595	0	2,315		0,9898	1	0,0102	1,020			
		100						100	100	100	4,671

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{5{,}81 + 6{,}01 + \ldots + 5{,}97}{10} = 5{,}943$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(7 - 5{,}943)^2 + (5 - 5{,}943)^2 + \ldots + (5{,}7 - 5{,}943)^2}{100 - 1}}$$

$$= 0{,}741$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{4{,}4995 - 5{,}943}{0{,}741} = -1{,}947$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{4{,}8945 - 5{,}943}{0{,}741} = -1{,}414$$

$P(Z2) - P(Z1) = 0{,}0793 - 0{,}0256 = 0{,}0537$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0537 * 100 = 5{,}37$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(8 - 7{,}93)^2}{7{,}93} + \ldots + \frac{(13 - 10{,}56)^2}{10.56} = 4{,}671$$

$v = k - r - 1 = 7 - 2 - 1 = 4$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 4{,}671 < 9{,}49$ Data mengikuti distribusi normal

18. Jarak Siku Ke Jari Kelingking (JSK)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{30{,}5 - 20}{7{,}6} = 1{,}382$$

Tabel Uji kenormalan data manual Jarak Siku Ke Jari Kelingking

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
<20	< 19.9995	0		-2,526	0,0000	0,0057	0,0057	0,570			
20 - 21,381	19,9995 - 21,3815	3	-2,526	-1,870	0,0057	0,0307	0,0250	2,500	9	11,31	0,472
21,382 - 22,763	21,3815 - 22,7635	6	-1,870	-1,214	0,0307	0,1131	0,0824	8,240			
22,764 - 24,145	22,7635 - 24,1455	20	-1,214	-0,558	0,1131	0,2877	0,1746	17,460	20	17,46	0,370
24,146 - 25,527	24,1455 - 25,5275	25	-0,558	0,098	0,2877	0,5398	0,2521	25,210	25	25,21	0,002
25,528 - 26,909	25,5275 - 26,9095	20	0,098	0,753	0,5398	0,7734	0,2336	23,360	20	23,36	0,483
26,91 - 28,291	26,9095 - 28,2915	18	0,753	1,409	0,7734	0,9207	0,1473	14,730	18	14,73	0,726
28,292 - 29,673	28,2915 - 29,6735	6	1,409	2,065	0,9207	0,9808	0,0601	6,010			
29,674 31,055	29,6735 31,0555	2	2,065	2,721	0,9808	0,9967	0,0159	1,590	8	7,930	0,001
>31.055	>31.0555	0	2,721		0,9967	1	0,0033	0,330			
		100						100	100	100	2,053

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{25,2 + 25,11 + ... + 25,45}{10} = 25,322$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(25 - 25,322)^2 + (23 - 25,322)^2 + ... + (26,5 - 25,322)^2}{100-1}}$$

$$= 2,107$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{19,9995 - 25,322}{2,107} = -2,526$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{21{,}3815 - 25{,}322}{2{,}107} = -1{,}87$$

$P(Z2) - P(Z1) = 0{,}0307 - 0{,}0057 = 0{,}0250$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0250 * 100 = 2{,}5$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(9 - 11{,}31)^2}{11{,}31} + ... + \frac{(8 - 7{,}93)^2}{7{,}93} = 2{,}053$$

$v = k - r - 1 = 6 - 2 - 1 = 3$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 7{,}81$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 2{,}053 < 7{,}81$ Data mengikuti distribusi normal

19. Jarak Siku Ke Jari Manis (JSM)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{32 - 21{,}5}{7{,}6} = 1{,}382$$

Tabel Uji kenormalan data manual Jarak Siku Ke Jari Manis

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
<21.5	< 21.4995	0		-2,454	0,0000	0,0071	0,0071	0,710	15	12,10	0,695
21,5 - 22,881	21,4995 - 22,8815	3	-2,454	-1,812	0,0071	0,0352	0,0281	2,810			
22,882 - 24,263	22,8815 - 24,2635	12	-1,812	-1,171	0,0352	0,1210	0,0858	8,580			
24,264 - 25,645	24,2635 - 25,6455	20	-1,171	-0,529	0,1210	0,2981	0,1771	17,710	20	17,71	0,296
25,646 - 27,027	25,6455 - 27,0275	22	-0,529	0,113	0,2981	0,5438	0,2457	24,570	22	24,57	0,269
27,028 - 28,409	27,0275 - 28,4095	19	0,113	0,755	0,5438	0,7764	0,2326	23,260	19	23,26	0,780
28,41 - 29,791	28,4095 - 29,7915	16	0,755	1,397	0,7764	0,9192	0,1428	14,280	16	14,28	0,207
29,792 - 31,173	29,7915 - 31,1735	5	1,397	2,039	0,9192	0,9793	0,0601	6,010	8	8,080	0,001
31,174 32,555	31,1735 32,5555	3	2,039	2,680	0,9793	0,9963	0,0170	1,700			
>32.555	>32.5555	0	2,680		0,9963	1	0,0037	0,370			
		100						100	100	100	2,248

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{25,98 + 25,52 + ... + 27,3}{10} = 26,784$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(27 - 26,784)^2 + (25 - 26,784)^2 + ... + (29 - 26,784)^2}{100 - 1}}$$

$$= 2,153$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{21,4995 - 26,784}{2,153} = -2,454$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{22{,}8815 - 26{,}784}{2{,}153} = -1{,}812$$

$P(Z2) - P(Z1) = 0{,}0352 - 0{,}0071 = 0{,}0281$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0281 * 100 = 2{,}81$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(15 - 12{,}1)^2}{12{,}1} + \ldots + \frac{(8 - 8{,}08)^2}{8{,}08} = 2{,}248$$

$v = k - r - 1 = 6 - 2 - 1 = 3$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 7{,}81$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 2{,}248 < 7{,}81$ Data mengikuti distribusi normal

20. Jarak Siku Ke Jari Tengah (JST)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{33 - 22}{7{,}6} = 1{,}447$$

Tabel Uji kenormalan data manual Jarak Siku Ke Jari Tengah

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
<22	< 21,9995	0	0,000	-2,655	0,0000	0,0039	0,0039	0,390	7	10,38	1,101
22 - 23,446	21,9995 - 23,4465	2	-2,655	-1,956	0,0039	0,0250	0,0211	2,110			
23,447 - 24,893	23,4465 - 24,8935	5	-1,956	-1,257	0,0250	0,1038	0,0788	7,880			
24,894 - 26,340	24,8935 - 26,3405	23	-1,257	-0,558	0,1038	0,2877	0,1839	18,390	23	18,39	1,156
26,341 - 27,787	26,3405 - 27,7875	26	-0,558	0,141	0,2877	0,5557	0,2680	26,800	26	26,80	0,024
27,788 - 29,234	27,7875 - 29,2345	20	0,141	0,840	0,5557	0,7995	0,2438	24,380	20	24,38	0,787
29,235 - 30,681	29,2345 - 30,6815	19	0,840	1,539	0,7995	0,9382	0,1387	13,870	19	13,87	1,897
30,682 - 31,128	30,6815 - 32,1285	4	1,539	2,238	0,9382	0,9875	0,0493	4,930	5	6,180	0,225
32,129 33,575	32,1285 33,5755	1	2,238	2,937	0,9875	0,9984	0,0109	1,090			
>33,575	>33,5755	0	2,937	0,000	0,9984	1	0,0016	0,160			
		100						100	100	100	5,190

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{26{,}9 + 26{,}95 + ... + 28{,}05}{10} = 27{,}495$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(26 - 27{,}495)^2 + (26 - 27{,}495)^2 + ... + (27 - 27{,}495)^2}{100 - 1}}$$

$$= 2{,}07$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{21{,}9995 - 27{,}495}{2{,}07} = -2{,}655$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{23{,}4465 - 27{,}495}{2{,}07} = -1{,}956$$

$P(Z2) - P(Z1) = 0{,}0250 - 0{,}0039 = 0{,}0211$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0211 * 100 = 2{,}11$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(7 - 10{,}38)^2}{10{,}38} + \ldots + \frac{(5 - 6{,}18)^2}{6{,}18} = 5{,}19$$

$v = k - r - 1 = 6 - 2 - 1 = 3$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 7{,}81$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 5{,}19 < 7{,}81$ Data mengikuti distribusi normal

21. Jarak Siku Ke Jari Telunjuk (JSTJ)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{32 - 21{,}5}{7{,}6} = 1{,}382$$

Tabel Uji kenormalan data manual Jarak Siku Ke Jari Telunjuk

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
<21,5	< 21,4995	0	0,000	-2,513	0,0000	0,0060	0,0060	0,600			
21,5 - 22,881	21,4995 - 22,8815	2	-2,513	-1,828	0,0060	0,0336	0,0276	2,760	13	12,71	0,007
22,882 - 24,263	22,8815 - 24,2635	11	-1,828	-1,143	0,0336	0,1271	0,0935	9,350			
24,264 - 25,645	24,2635 - 25,6455	19	-1,143	-0,458	0,1271	0,3228	0,1957	19,570	19	19,57	0,017
25,646 - 27,027	25,6455 - 27,0275	30	-0,458	0,227	0,3228	0,5871	0,2643	26,430	30	26,43	0,482
27,028 - 28,409	27,0275 - 28,4095	18	0,227	0,912	0,5871	0,8186	0,2315	23,150	18	23,15	1,146
28,41 - 29,791	28,4095 - 29,7915	16	0,912	1,597	0,8186	0,9452	0,1266	12,660	16	12,66	0,881
29,792 - 31,173	29,7915 - 31,1735	2	1,597	2,281	0,9452	0,9887	0,0435	4,350			
31,174 32,555	31,1735 32,5555	2	2,281	2,966	0,9887	0,9985	0,0098	0,980	4	5,480	0,400
>32,555	>32,5555	0	2,966	0,000	0,9985	1	0,0015	0,150			
		100						100	100	100	2,932

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{26{,}15 + 26{,}5 + ... + 26{,}55}{10} = 26{,}57$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(27-26{,}57)^2 + (25-26{,}57)^2 + ... + (28{,}5-26{,}57)^2}{100-1}}$$

$$= 2{,}018$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{21{,}4995 - 26{,}57}{2{,}018} = -2{,}513$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{22{,}8815 - 26{,}57}{2{,}018} = -1{,}828$$

$P(Z2) - P(Z1) = 0{,}0336 - 0{,}0060 = 0{,}0276$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0276 * 100 = 2{,}76$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(13 - 12{,}71)^2}{12{,}71} + \ldots + \frac{(4 - 5{,}48)^2}{5{,}48} = 2{,}932$$

$v = k - r - 1 = 6 - 2 - 1 = 3$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 7{,}81$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 2{,}932 < 7{,}81$ Data mengikuti distribusi normal

22. Jarak Siku Ke Ibu Jari (JSIJ)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{26{,}5 - 20}{7{,}6} = 0{,}855$$

Tabel Uji kenormalan data manual Jarak Siku Ke Ibu Jari

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
<20	< 19,9995	0	0,000	-2,178	0,0000	0,0146	0,0146	1,460	5	5,16	0,005
20 - 20,854	19,9995 - 20,8545	5	-2,178	-1,630	0,0146	0,0516	0,0370	3,700			
20,855 - 21,709	20,8545 - 21,7095	11	-1,630	-1,083	0,0516	0,1401	0,0885	8,850	11	8,85	0,522
21,71 - 22,564	21,7095 - 22,5645	15	-1,083	-0,535	0,1401	0,2946	0,1545	15,450	15	15,45	0,013
22,565 - 23,419	22,5645 - 23,4195	15	-0,535	0,012	0,2946	0,5040	0,2094	20,940	15	20,94	1,685
23,42 - 24,274	23,4195 - 24,2745	21	0,012	0,560	0,5040	0,7123	0,2083	20,830	21	20,83	0,001
24,275 - 25,129	24,2745 - 25,1295	23	0,560	1,108	0,7123	0,8665	0,1542	15,420	23	15,42	3,726
25,13 - 25,984	25,1295 - 25,9845	7	1,108	1,655	0,8665	0,9515	0,0850	8,500			
25,985 26,839	25,9845 26,8395	3	1,655	2,203	0,9515	0,9861	0,0346	3,460	10	13,350	0,841
>26,839	>26,8395	0	2,203	0,000	0,9861	1	0,0139	1,390			
		100						100	100	100	6,793

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{23{,}18 + 23{,}4 + \ldots + 23{,}65}{10} = 23{,}4$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(22 - 23{,}4)^2 + (25{,}5 - 23{,}4)^2 + \ldots + (25 - 23{,}4)^2}{100 - 1}}$$

$$= 1{,}561$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{19{,}9995 - 23{,}4}{1{,}561} = -2{,}178$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{20{,}8545 - 23{,}4}{1{,}561} = -1{,}63$$

$P(Z2) - P(Z1) = 0{,}0516 - 0{,}0146 = 0{,}0370$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0370 * 100 = 3{,}7$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(5 - 5{,}16)^2}{5{,}16} + \ldots + \frac{(10 - 13{,}35)^2}{13{,}35} = 6{,}793$$

$v = k - r - 1 = 7 - 2 - 1 = 4$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 6{,}793 < 9{,}49$ Data mengikuti distribusi normal

23. Jarak Siku Ke Pergelangan Tangan (JSPT)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{20 - 14}{7{,}6} = 0{,}79$$

Tabel Uji kenormalan data manual Jarak Siku Ke Pergelangan Tangan

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
<14	<13,995	0	0,000	-2,001	0,0000	0,0228	0,0228	2,280	7	7,93	0,109
14 - 14,780	13,995 - 14,785	7	-2,001	-1,413	0,0228	0,0793	0,0565	5,650			
14,79 - 15,570	14,785 - 15,575	15	-1,413	-0,825	0,0793	0,2033	0,1240	12,400	15	12,40	0,545
15,58 - 16,360	15,575 - 16,365	18	-0,825	-0,237	0,2033	0,4052	0,2019	20,190	18	20,19	0,238
16,37 - 17,150	16,365 - 17,155	25	-0,237	0,351	0,4052	0,6368	0,2316	23,160	25	23,16	0,146
17,16 - 17,940	17,155 - 17,945	15	0,351	0,939	0,6368	0,8264	0,1896	18,960	15	18,96	0,827
17,95 - 18,730	17,945 - 18,735	14	0,939	1,528	0,8264	0,9370	0,1106	11,060	14	11,06	0,782
18,74 - 19,520	18,735 - 19,525	5	1,528	2,116	0,9370	0,9830	0,0460	4,600	6	6,300	0,014
19,53 20,310	19,525 20,315	1	2,116	2,704	0,9830	0,9965	0,0135	1,350			
>20,31	>20,315	0	2,704	0,000	0,9965	1	0,0035	0,350			
		100						100	100,00	100,00	2,661

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{16,55 + 16,53 + ... + 16,75}{10} = 16,683$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(14,5 - 16,683)^2 + (19 - 16,683)^2 + ... + (17 - 16,683)^2}{100-1}}$$

$$= 1,343$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{13,995 - 16,683}{1,343} = -2,001$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{14{,}785 - 16{,}683}{1{,}343} = -1{,}413$$

P(Z2) – P(Z1) = 0,0793– 0,0228 = 0,0565

Ei = (P(Z2) – P(Z1))* $\sum oi$ = 0,0565 * 100 = 5,65

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(7 - 7{,}93)^2}{7{,}93} + \ldots + \frac{(6 - 6{,}3)^2}{6{,}3} = 2{,}661$$

v = k – r – 1 = 7 – 2 – 1 = 4

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 2{,}661 < 9{,}49$ Data mengikuti distribusi normal

24. Lebar Tangan Dengan Ibu Jari (LTIJ)

k = 1 + 3.3 log n = 1 + 3.3 log 100 = 7,6 $\approx$ 8

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{9{,}5 - 6}{7{,}6} = 0{,}461$$

Tabel Uji kenormalan data manual Lebar Tangan Dengan Ibu Jari

Interval Kelas	**Batas Kelas**	**Oi**	**Z1**	**Z2**	**P(Z1)**	**P(Z2)**	**P(Z2) - P(Z1)**	**Ei**	**Oi gab**	**Ei gab**	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
<6	<5.9995	0		-2,192	0,0000	0,0143	0,0143	1,430			
6 - 6,460	5,9995 - 6,4605	6	-2,192	-1,649	0,0143	0,0495	0,0352	3,520	13	13,35	0,009
6,461 - 6,921	6,4605 - 6,9215	7	-1,649	-1,105	0,0495	0,1335	0,0840	8,400			
6,922 - 7,382	6,9215 - 7,3825	14	-1,105	-0,562	0,1335	0,2877	0,1542	15,420	14	15,42	0,131
7,383 - 7,843	7,3825 - 7,8435	16	-0,562	-0,018	0,2877	0,4920	0,2043	20,430	16	20,43	0,961
7,844 - 8,304	7,8435 - 8,3045	25	-0,018	0,525	0,4920	0,7019	0,2099	20,990	25	20,99	0,766
8,305 - 8,765	8,3045 - 8,7655	15	0,525	1,069	0,7019	0,8577	0,1558	15,580	15	15,58	0,022
8,766 - 9,226	8,7655 - 9,2265	12	1,069	1,612	0,8577	0,9463	0,0886	8,860	12	8,860	1,113
9,227 9,687	9,2265 9,6875	5	1,612	2,156	0,9463	0,9846	0,0383	3,830	5	5,370	0,025
>9.687	>9.6875	0	2,156		0,9846	1	0,0154	1,540			
		100						100	100	100	3,027

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{7{,}66 + 7{,}75 + ... + 7{,}96}{10} = 7{,}859$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(6 - 7{,}859)^2 + (7{,}5 - 7{,}859)^2 + ... + (7{,}2 - 7{,}859)^2}{100 - 1}}$$

$$= 0{,}848$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{5{,}9995 - 7{,}859}{0{,}848} = -2{,}192$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{6{,}4605 - 7{,}859}{10{,}848} = -1{,}649$$

$P(Z2) - P(Z1) = 0{,}0495 - 0{,}0143 = 0{,}0352$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0352 * 100 = 3{,}52$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(13 - 13{,}35)^2}{13{,}35} + \ldots + \frac{(5 - 5{,}37)^2}{5{,}37} = 3{,}027$$

$v = k - r - 1 = 7 - 2 - 1 = 4$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 3{,}027 < 9{,}49$ Data mengikuti distribusi normal

25. Lebar Jari Telunjuk (LTJ)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{1{,}4 - 0{,}65}{7{,}6} = 0{,}0987$$

Tabel Uji kenormalan data manual Lebar Jari Telunjuk (LTJ)

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
<0,65	< 0,6495	0	0,000	-2,169	0,0000	0,0150	0,0150	1,500	5	5,59	0,062
0,65 - 0,748	0,6495 - 0,7485	5	-2,169	-1,594	0,0150	0,0559	0,0409	4,090			
0,749 - 0,847	0,7485 - 0,8475	11	-1,594	-1,018	0,0559	0,1539	0,0980	9,800	11	9,80	0,147
0,848 - 0,946	0,8475 - 0,9465	13	-1,018	-0,442	0,1539	0,3300	0,1761	17,610	13	17,61	1,207
0,947 - 1,045	0,9465 - 1,0455	20	-0,442	0,134	0,3300	0,5517	0,2217	22,170	20	22,17	0,212
1,046 - 1,144	1,0455 - 1,1445	24	0,134	0,710	0,5517	0,7611	0,2094	20,940	24	20,94	0,447
1,145 - 1,243	1,1445 - 1,2435	14	0,710	1,285	0,7611	0,9015	0,1404	14,040	14	14,04	0,000
1,244 - 1,342	1,2435 - 1,3425	11	1,285	1,861	0,9015	0,9686	0,0671	6,710	13	9,850	1,007
1,343 - 1,441	1,3425 - 1,4415	2	1,861	2,437	0,9686	0,9927	0,0241	2,410			
>1,441	>1,4415	0	2,437	0,000	0,9927	1	0,0073	0,730			
		100						100	100	100	3,083

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{1{,}016 + 1{,}05 + ... + 1{,}017}{10} = 1{,}0225$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(0{,}7 - 1{,}0225)^2 + (1 - 1{,}0225)^2 + ... + (1 - 1{,}0225)^2}{100-1}}$$

$$= 0{,}172$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{0{,}6495 - 1{,}0225}{0{,}172} = -2{,}169$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{0{,}7485 - 1{,}0225}{0{,}172} = -1{,}594$$

$P(Z2) - P(Z1) = 0{,}0559 - 0{,}0150 = 0{,}0409$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0409 * 100 = 4{,}09$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(5 - 5{,}59)^2}{5{,}59} + \ldots + \frac{(13 - 9{,}85)^2}{9{,}85} = 3{,}083$$

$v = k - r - 1 = 7 - 2 - 1 = 4$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 3{,}083 < 9{,}49$ Data mengikuti distribusi normal

26. Lebar Jari Tengah (LJT)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{1{,}8 - 0{,}7}{7{,}6} = 0{,}145$$

Tabel Uji kenormalan data manual Lebar Jari Tengah

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
<0,7	< 0,6995	0	0,000	-2,051	0,0000	0,0202	0,0202	2,020	11	8,38	0,819
0,7 · 0,844	0,6995 - 0,8445	11	-2,051	-1,376	0,0202	0,0838	0,0636	6,360			
0,845 - 0,989	0,8445 - 0,9895	12	-1,376	-0,702	0,0838	0,2420	0,1582	15,820	12	15,82	0,922
0,99 - 1,134	0,9895 - 1,1345	21	-0,702	-0,027	0,2420	0,4880	0,2460	24,600	21	24,60	0,527
1,135 - 1,279	1,1345 - 1,2795	24	-0,027	0,648	0,4880	0,7422	0,2542	25,420	24	25,42	0,079
1,28 - 1,424	1,2795 - 1,4245	25	0,648	1,322	0,7422	0,9066	0,1644	16,440	25	16,44	4,457
1,425 · 1,569	1,4245 - 1,5695	6	1,322	1,997	0,9066	0,9767	0,0701	7,010	7	9,34	0,586
1,57 · 1,714	1,5695 - 1,7145	0	1,997	2,672	0,9767	0,9962	0,0195	1,950			
1,715 · 1,859	1,7145 - 1,8595	1	2,672	3,347	0,9962	0,9996	0,0034	0,340			
>1,859	>1,8595	0	3,347	0,000	0,9996	1	0,0004	0,040			
		100						100	100	100	7,391

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{1{,}141 + 1{,}138 + \ldots + 1{,}143}{10} = 1{,}1403$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(1{,}2 - 1{,}1403)^2 + (0{,}8 - 1{,}1403)^2 + \ldots + (1{,}35 - 1{,}1403)^2}{100 - 1}}$$

$$= 0{,}2149$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{0,6995 - 1,1403}{0,2149} = -2,051$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{0,8445 - 1,1403}{0,2149} = -1,376$$

$P(Z2) - P(Z1) = 0,0838 - 0,0202 = 0,0636$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0,0636 * 100 = 6,36$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(11 - 8,38)^2}{8,38} + ... + \frac{(7 - 9,34)^2}{9,34} = 7,391$$

$v = k - r - 1 = 6 - 2 - 1 = 3$

$\alpha = 0,05$

$\chi^2_{(\alpha,V)} = 7,81$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 7,391 < 7,81$ Data mengikuti distribusi normal

27. Panjang Telapak Tangan (PTT)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7,6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{15 - 8}{7,6} = 0,921$$

Tabel Uji kenormalan data manual Panjang Telapak Tangan

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(Oigab-Eigab)^2}{Eigab}$
< 8	< 7,9995	0	0,000	-2,316	0,0000	0,0102	0,0102	1,020			
8 - 8,920	7,9995 · 8,9205	4	-2,316	-1,727	0,0102	0,0418	0,0316	3,160	14	12,71	0,131
8,921 - 9,841	8,9205 · 9,8415	10	-1,727	-1,138	0,0418	0,1271	0,0853	8,530			
9,842 - 10,762	9,8415 - 10,7625	12	-1,138	-0,549	0,1271	0,2912	0,1641	16,410	12	16,41	1,185
10,763 - 11,683	10,7625 - 11,6835	22	-0,549	0,040	0,2912	0,5160	0,2248	22,480	22	22,48	0,010
11,684 - 12,604	11,6835 - 12,6045	25	0,040	0,629	0,5160	0,7357	0,2197	21,970	25	21,97	0,418
12,605 - 13,525	12,6045 - 13,5255	13	0,629	1,218	0,7357	0,8888	0,1531	15,310	13	15,31	0,349
13,526 - 14,446	13,5255 · 14,4465	11	1,218	1,807	0,8888	0,9649	0,0761	7,610			
14,447 - 15,367	14,4465 · 15,3675	3	1,807	2,396	0,9649	0,9916	0,0267	2,670	14	11,12	0,746
>15,367	>15,3675	0	2,396	0,000	0,9916	1	0,0084	0,840			
		100						100	100	100	2,839

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{11{,}46 + 11{,}51 + ... + 11{,}85,}{10} = 11{,}621$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(8{,}5 - 11{,}621)^2 + (11 - 11{,}621)^2 + ... + (11 - 11{,}621)^2}{100-1}}$$
$$= 1{,}563$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{7{,}9995 - 11{,}621}{1{,}563} = -2{,}316$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{8{,}9205 - 11{,}621}{1{,}563} = -1{,}727$$

$P(Z2) - P(Z1) = 0{,}0418 - 0{,}0102 = 0{,}0316$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0316 * 100 = 3{,}16$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(14 - 12{,}71)^2}{12{,}71} + \ldots + \frac{(14 - 11{,}12)^2}{11{,}12} = 2{,}839$$

$v = k - r - 1 = 6 - 2 - 1 = 3$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 7{,}81$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 2{,}839 < 7{,}81$ Data mengikuti distribusi normal

28. Lebar Jari Manis (LJM)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{1{,}5 - 0{,}6}{7{,}6} = 0{,}118 \approx 0{,}12$$

Tabel Uji kenormalan data manual Lebar Jari Manis

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
< 0,6	<0,595	0	0,000	-2,435	0,0000	0,0073	0,0073	0,730			
0,6 - 0,71	0,595 - 0,715	7	-2,435	-1,696	0,0073	0,0455	0,0382	3,820	18	16,35	0,167
0,72 - 0,83	0,715 - 0,835	11	-1,696	-0,957	0,0455	0,1635	0,1180	11,800			
0,84 - 0,95	0,835 - 0,955	19	-0,957	-0,217	0,1635	0,4129	0,2494	24,940	19	24,94	1,415
0,96 - 1,07	0,955 - 1,075	34	-0,217	0,522	0,4129	0,6985	0,2856	28,560	34	28,56	1,036
1,08 - 1,19	1,075 - 1,195	15	0,522	1,261	0,6985	0,8962	0,1977	19,770	15	19,77	1,151
1,2 - 1,31	1,195 - 1,315	13	1,261	2,000	0,8962	0,9772	0,0810	8,100			
1,32 - 1,43	1,315 - 1,435	0	2,000	2,739	0,9772	0,9969	0,0197	1,970	14	10,38	1,262
1,44 1,55	1,435 1,555	1	2,739	3,478	0,9969	0,9997	0,0028	0,280			
>1,55	>1,555	0	3,478	0,000	0,9997	1	0,0003	0,030			
		100						100	100	100	5,031

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{1{,}015 + 0{,}993 + \ldots + 0{,}99}{10} = 0{,}9903$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36}(xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(1-0{,}9903)^2 + (0{,}8-0{,}9903)^2 + ... + (0{,}95-0{,}9903)^2}{100-1}}$$

$$= 0{,}1623$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{0{,}595 - 0{,}9903}{0{,}162} = -2{,}435$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{0{,}715 - 0{,}9903}{0{,}162} = -1{,}696$$

$P(Z2) - P(Z1) = 0{,}0455 - 0{,}0073 = 0{,}0382$

$Ei = (P(Z2) - P(Z1))^* \sum oi = 0{,}0382 * 100 = 3{,}82$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(18-16{,}35)^2}{16{,}35} + ... + \frac{(14-10{,}38)^2}{10{,}38} = 5{,}031$$

$v = k - r - 1 = 5 - 2 - 1 = 2$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 5{,}99$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 5{,}031 < 5{,}99$ Data mengikuti distribusi normal

29. Panjang Ibu Jari (PIJ)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{4{,}8 - 3}{7{,}6} = 0{,}236 \approx 0{,}24$$

Tabel Uji kenormalan data manual Panjang Jari Manis

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
<3	< 2,995	0	0,000	-2,486	0,0000	0,0064	0,0064	0,640	16	13,14	0,622
3 - 3,23	2,995 - 3,235	5	-2,486	-1,802	0,0064	0,0359	0,0295	2,950			
3,24 - 3,47	3,235 - 3,475	11	-1,802	-1,118	0,0359	0,1314	0,0955	9,550			
3,48 - 3,71	3,475 - 3,715	17	-1,118	-0,433	0,1314	0,3336	0,2022	20,220	17	20,22	0,513
3,72 - 3,95	3,715 - 3,955	23	-0,433	0,251	0,3336	0,5987	0,2651	26,510	23	26,51	0,465
3,96 - 4,19	3,955 - 4,195	23	0,251	0,935	0,5987	0,8246	0,2259	22,590	23	22,59	0,007
4,2 - 4,43	4,195 - 4,435	15	0,935	1,619	0,8246	0,9474	0,1228	12,280	15	12,28	0,602
4,44 - 4,67	4,435 - 4,675	5	1,619	2,303	0,9474	0,9893	0,0419	4,190	6	5,260	0,104
4,68 - 4,91	4,675 - 4,915	1	2,303	2,988	0,9893	0,9986	0,0093	0,930			
>4,91	>4,915	0	2,988	0,000	0,9986	1	0,0014	0,140			
		100						100,000	100,00	100,00	2,314

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{3{,}8 + 3{,}85 + \ldots + 3{,}96}{10} = 3{,}867$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36}(xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(3-3{,}867)^2 + (3{,}6-3{,}867)^2 + \ldots + (4{,}2-3{,}867)^2}{100-1}}$$

$$= 0{,}3507$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{2{,}995 - 3{,}867}{0{,}3507} = -2{,}486$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{3{,}235 - 3{,}867}{0{,}3507} = -1{,}802$$

$P(Z2) - P(Z1) = 0{,}0359 - 0{,}0064 = 0{,}0295$

$Ei = (P(Z2) - P(Z1))^* \sum oi = 0{,}0295 * 100 = 2{,}95$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(16-13{,}14)^2}{13{,}14} + \ldots + \frac{(6-5{,}26)^2}{5{,}26} = 2{,}314$$

$v = k - r - 1 = 6 - 2 - 1 = 3$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 7{,}81$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 2{,}314 < 7{,}81$ Data mengikuti distribusi normal

30. Panjang Telapak Tangan (PTT)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{8{,}8 - 5{,}6}{7{,}6} = 0{,}421 \approx 0{,}42$$

Tabel Uji kenormalan data manual Panjang Telapak Tangan

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
<5,6	< 5,595	0	0,000	-2,277	0,0000	0,0113	0,0113	1,13			
5,6 - 6,01	5,595 - 6,015	6	-2,277	-1,646	0,0113	0,0495	0,0382	3,82	16	15,62	0,009
6,02 - 6,43	6,015 - 6,435	10	-1,646	-1,014	0,0495	0,1562	0,1067	10,67			
6,44 - 6,85	6,435 - 6,855	17	-1,014	-0,383	0,1562	0,3520	0,1958	19,58	17	19,58	0,340
6,86 - 7,27	6,855 - 7,275	23	-0,383	0,248	0,3520	0,5987	0,2467	24,67	23	24,67	0,113
7,28 - 7,69	7,275 - 7,695	20	0,248	0,879	0,5987	0,8106	0,2119	21,19	20	21,19	0,067
7,7 - 8,11	7,695 - 8,115	18	0,879	1,510	0,8106	0,9345	0,1239	12,39	18	12,39	2,540
8,12 - 8,53	8,115 - 8,535	5	1,510	2,142	0,9345	0,9838	0,0493	4,93			
8,54 - 8,95	8,535 - 8,955	1	2,142	2,773	0,9838	0,9972	0,0134	1,34	6	6,55	0,046
>8,95	>8,955	0	2,773	0,000	0,9972	1	0,0028	0,28			
		100,00						100,00	100,00	100,00	3,115

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{7{,}01 + 7{,}04 + \ldots + 7{,}1}{10} = 7{,}11$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(5{,}6 - 7{,}11)^2 + (7{,}4 - 7{,}11)^2 + \ldots + (7{,}4 - 7{,}11)^2}{100 - 1}}$$

$$= 0{,}665$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{5{,}595 - 7{,}11}{0{,}665} = -2{,}277$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{6{,}015 - 7{,}11}{0{,}6657} = -1{,}646$$

$P(Z2) - P(Z1) = 0{,}0495 - 0{,}0113 = 0{,}0382$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0382 * 100 = 3{,}82$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(16 - 15{,}62)^2}{15{,}62} + \ldots + \frac{(6 - 6{,}55)^2}{6{,}55} = 3{,}115$$

$v = k - r - 1 = 6 - 2 - 1 = 3$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 7{,}81$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 3{,}115 < 7{,}81$ Data mengikuti distribusi normal

31. Lebar Ibu Jari (LIJ)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{2{,}3 - 1{,}05}{7{,}6} = 0{,}164 \approx 0{,}16$$

Tabel Uji kenormalan data manual Lebar Ibu Jari

Interval Kelas	**Batas Kelas**	**Oi**	**Z1**	**Z2**	**P(Z1)**	**P(Z2)**	**P(Z2) - P(Z1)**	**Ei**	**Oi gab**	**Ei gab**	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
< 1,05	< 1,045	0	0,000	-2,151	0,0000	0,0158	0,0158	1,580	9	5,16	2,858
1,05 - 1,20	1,045 - 1,205	9	-2,151	-1,626	0,0158	0,0516	0,0358	3,580			
1,21 - 1,36	1,205 - 1,365	11	-1,626	-1,101	0,0516	0,1357	0,0841	8,410	11	8,41	0,798
1,37 - 1,52	1,365 - 1,525	12	-1,101	-0,576	0,1357	0,2810	0,1453	14,530	12	14,53	0,441
1,53 - 1,68	1,525 - 1,685	15	-0,576	-0,051	0,2810	0,4801	0,1991	19,910	15	19,91	1,211
1,69 - 1,84	1,685 - 1,845	20	-0,051	0,474	0,4801	0,6808	0,2007	20,070	20	20,07	0,000
1,85 - 2,00	1,845 - 2,005	15	0,474	0,999	0,6808	0,8389	0,1581	15,810	15	15,81	0,041
2,01 - 2,16	2,005 - 2,165	11	0,999	1,525	0,8389	0,9370	0,0981	9,810	11	9,810	0,144
2,17 2,32	2,165 2,325	7	1,525	2,050	0,9370	0,9798	0,0428	4,280	7	6,300	0,078
>2,32	>2,325	0	2,050	0,000	0,9798	1	0,0202	2,020			
		100,00						100,00	100,00	100,00	4,773

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{1{,}693 + 1{,}704 + \ldots + 1{,}684}{10} = 1{,}7005 \approx 1{,}70$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(1{,}05-1{,}70)^2 + (2{,}25-1{,}70)^2 + \ldots + (1{,}92-1{,}70)^2}{100-1}}$$

$$= 0{,}3046 \approx 0{,}305$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{1{,}045 - 1{,}70}{0{,}305} = -2{,}151$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{1{,}205 - 1{,}70}{0{,}305} = -1{,}626$$

$P(Z2) - P(Z1) = 0{,}0516 - 0{,}0158 = 0{,}0358$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0358 * 100 = 3{,}58$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(9 - 5{,}16)^2}{5{,}16} + \ldots + \frac{(7 - 6{,}30)^2}{6{,}30} = 4{,}773$$

$v = k - r - 1 = 8 - 2 - 1 = 5$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 11{,}07$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 4{,}773 < 11{,}07$ Data mengikuti distribusi normal

32. Panjang Jari Telunjuk (PTJ)

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7,6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{5,72 - 3,81}{7,6} = 0,251 \approx 0,25$$

Tabel Uji kenormalan data manual Panjang Ibu Jari

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
< 3,81	< 3,805	0	0,000	-2,236	0,0000	0,0125	0,0125	1,25	16	11,90	1,413
3,81 - 4,05	3,805 - 4,055	7	-2,236	-1,708	0,0125	0,0436	0,0311	3,11			
4,06 - 4,30	4,055 - 4,305	9	-1,708	-1,180	0,0436	0,1190	0,0754	7,54			
4,31 - 4,55	4,305 - 4,555	11	-1,180	-0,652	0,1190	0,2578	0,1388	13,88	11	13,88	0,598
4,56 - 4,80	4,555 - 4,805	16	-0,652	-0,124	0,2578	0,4522	0,1944	19,44	16	19,44	0,609
4,81 - 5,05	4,805 - 5,055	18	-0,124	0,404	0,4522	0,6554	0,2032	20,32	18	20,32	0,265
5,06 - 5,30	5,055 - 5,305	15	0,404	0,933	0,6554	0,8238	0,1684	16,84	15	16,84	0,201
5,31 - 5,55	5,305 - 5,555	14	0,933	1,461	0,8238	0,9278	0,1040	10,40	14	10,40	1,246
5,56 - 5,80	5,555 - 5,805	10	1,461	1,989	0,9278	0,9767	0,0489	4,89	10	7,22	1,070
>5,8	>5,805	0	1,989	0,000	0,9767	1	0,0233	2,330			
		100,00						100,00	100,00	100,00	5,401

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{4,785 + 4,897 + ... + 4,95}{10} = 4,864 \approx 4,86$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36}(xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(3{,}81 - 4{,}864)^2 + (4{,}95 - 4{,}864)^2 + ... + (4{,}7 - 4{,}864)^2}{100-1}}$$

$$= 0{,}47345 \approx 0{,}474$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{3{,}805 - 4{,}864}{0{,}474} = -2{,}236$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{4{,}055 - 4{,}864}{0{,}474} = -1{,}708$$

$P(Z2) - P(Z1) = 0{,}0436 - 0{,}0125 = 0{,}0311$

$Ei = (P(Z2) - P(Z1))^* \sum oi = 0{,}0311 * 100 = 3{,}11$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(16 - 11{,}90)^2}{11{,}90} + ... + \frac{(10 - 7{,}22)^2}{7{,}22} = 5{,}401$$

$v = k - r - 1 = 7 - 2 - 1 = 4$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 5{,}401 < 9{,}49$ Data mengikuti distribusi normal

33. TebalTelapak Tangan

$k = 1 + 3.3 \log n = 1 + 3.3 \log 100 = 7{,}6 \approx 8$

$$c = \frac{\text{data max} - \text{data min}}{k} = \frac{2{,}5 - 1{,}1}{7{,}6} = 0{,}184 \approx 0{,}18$$

Tabel Uji kenormalan data manual Panjang Ibu Jari

Interval Kelas	Batas Kelas	Oi	Z1	Z2	P(Z1)	P(Z2)	P(Z2) - P(Z1)	Ei	Oi gab	Ei gab	$\frac{(\text{Oigab}-\text{Eigab})^2}{\text{Eigab}}$
< 1,10	< 1,095	0	0,000	-1,882	0,0000	0,0301	0,0301	3,01	6	9,34	1,194
1,10 - 1,27	1,095 · 1,275	6	-1,882	-1,318	0,0301	0,0934	0,0633	6,33			
1,28 - 1,45	1,275 - 1,455	19	-1,318	-0,753	0,0934	0,2266	0,1332	13,32	19	13,32	
1,46 - 1,63	1,455 - 1,635	23	-0,753	-0,188	0,2266	0,4247	0,1981	19,81	23	19,81	0,514
1,64 - 1,81	1,635 - 1,815	20	-0,188	0,376	0,4247	0,6480	0,2233	22,33	20	22,33	0,243
1,82 - 1,99	1,815 - 1,995	14	0,376	0,941	0,6480	0,8264	0,1784	17,84	14	17,84	0,827
2,00 - 2,17	1,995 - 2,175	10	0,941	1,506	0,8264	0,9345	0,1081	10,81	10	10,81	0,061
2,18 - 2,35	2,175 · 2,355	5	1,506	2,071	0,9345	0,9808	0,0463	4,63	8	6,55	0,321
2,36 - 2,53	2,355 · 2,535	3	2,071	2,635	0,9808	0,9959	0,0151	1,51			
>2,53	>2,535	0	2,635	0,000	0,9959	1	0,0041	0,410			
		100						100	100,00	100,00	3,159

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{1{,}63 + 1{,}68 + ... + 1{,}705}{10} = 1{,}695 \approx 1{,}70$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36}(xi - \bar{x})^2}{N-1}} = \sqrt{\frac{(1{,}1-1{,}695)^2 + (1{,}9-1{,}695)^2 + \ldots + (1{,}35-1{,}695)^2}{100-1}}$$

$$= 0{,}3187 \approx 0{,}319$$

$$Z1 = \frac{\text{batas bawah kelas} - \bar{x}}{S} = \frac{1{,}095 - 1{,}695}{0{,}319} = -1{,}882$$

$$Z2 = \frac{\text{batas atas kelas} - \bar{x}}{S} = \frac{1{,}275 - 1{,}695}{0{,}319} = -1{,}318$$

$P(Z2) - P(Z1) = 0{,}0934 - 0{,}0301 = 0{,}0633$

$Ei = (P(Z2) - P(Z1)) * \sum oi = 0{,}0633 * 100 = 6{,}33$

$$\chi^2 = \sum \frac{(oig - eig)^2}{eig} = \frac{(6-9{,}34)^2}{9{,}34} + \ldots + \frac{(8-6{,}55)^2}{6{,}55} = 3{,}159$$

$v = k - r - 1 = 7 - 2 - 1 = 4$

$\alpha = 0{,}05$

$\chi^2_{(\alpha,V)} = 9{,}49$

$\chi^2 < \chi^2_{(\alpha,V)} \Rightarrow 3{,}159 < 9{,}49$ Data mengikuti distribusi normal

Tinggi Siku Berdiri (TSB)

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	69	66	64,5	72	74	66,5	65	67	67,8	71	68,28

2	72	71	66	63,5	66	65	73	73,5	66	65	68,1
3	68	67,5	67,5	68	66,8	62	67,5	68	65	65	66,53
4	64	70	72,5	70	68	65	70	65	70	66	68,05
5	69	72	62	69,5	72,5	68,5	66	69	72	72,5	69,3
6	69,5	73,5	70	68	64,5	68	67	65,6	66	68	68,01
7	69,5	69,5	71	73	65	64	63,5	66	68	69	67,85
8	70	71,5	68,5	69,5	66	69	70	72	71	70,5	69,8
9	69	72	71,5	69	68	67,5	66	64,8	65,5	74	68,73
10	71	70	65	68	66	68,5	63,8	65	66,5	66	66,98
										Total	681,63
										Rata-rata	68,163

Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{68{,}28 + 68{,}1 + ... + 66{,}98}{10} = 68{,}163$$

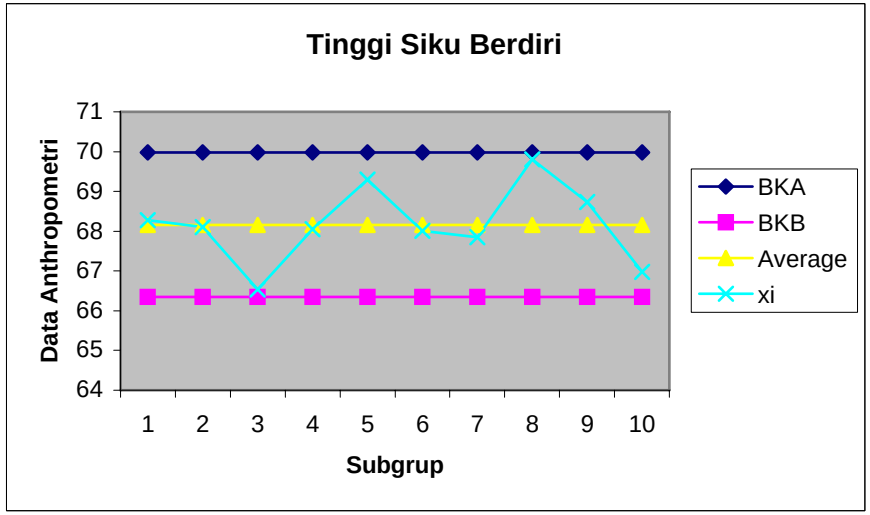
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(69 - 68{,}163)^2 + (66 - 68{,}163)^2 + ... + (66 - 68{,}163)^2}{100 - 1}}$$

$$= 2{,}869$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{2{,}869}{\sqrt{10}} = 0{,}907$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 68{,}163 + (2 * 0{,}907) = 69{,}978$$

$$BKB = \bar{\bar{x}} - c\sigma_{\bar{x}} = 68{,}163 - (2 * 0{,}907) = 66{,}348$$



Gambar Grafik Peta Batas Kelas (Manual) Tinggi Siku Berdiri

Kesimpulan : Seluruh nilai rata-rata subgroup berada di dalam batas kendali BKA dan BKB, maka data telah seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0.05 \sqrt{(100 * 465503) - 6816{,}8^2}}{6816{,}8} \right]^2 = 2{,}8075$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 74 – 62 = 12

P_5 = (Range * 5 %) + Data Minimum = (12* 5 %) + 62 = 62,6

P_{50} = (Range * 50 %) + Data Minimum = (12* 50 %) + 62 = 68

P_{95} = (Range * 5 %) + Data Minimum = (12* 95 %) + 62 = 73,4

Tinggi Duduk Tegak (TDT)

Uji Keseragaman Data

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	55	59	54	62	66	56	54	58	65	60,5	58,95
2	65	57	64	54,5	59	62	50,5	63	59	55	58,9
3	62	59	59	62,5	55	60	60	56	62	54	58,95
4	59	56	57	59	54	60	59	64	64	57	58,9
5	57,5	58	50	59	62	55	58,5	60	65,5	57,5	58,3
6	61	52,5	54	60	58,3	55	53,5	63,5	59,5	66	58,33
7	50,5	53	57,5	65	59,6	52	56,5	64	65,5	59,8	58,34
8	64,5	53	66	58	57,5	56	61	51,5	52	63	58,25
9	52,5	56	62,5	57	53,5	59	63	60,5	64	60	58,8
10	51,6	55	59,5	65	60,4	57	52,6	62	58	61,5	58,26
										Total	**585,98**
										Rata-rata	**58,598**

Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{58.95 + 58.9 + ... + 58.26}{10} = 58{,}598$$

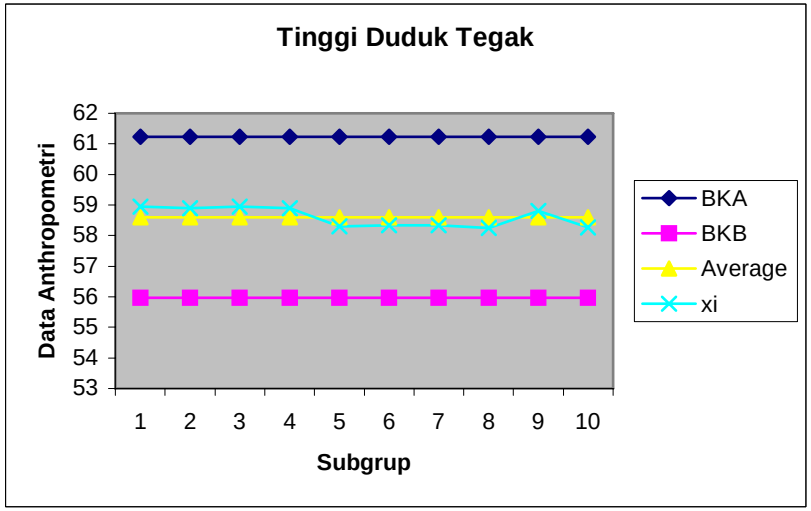
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(55 - 58{,}598)^2 + (59 - 58{,}598)^2 + ... + (61{,}5 - 58{,}598)^2}{100 - 1}}$$

$$= 4{,}154$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{4{,}154}{\sqrt{10}} = 1{,}3136 \approx 1{,}314$$

$$BKA = \bar{\bar{x}} + c\sigma_{\bar{x}} = 58{,}598 + (2 * 1{,}314) = 61{,}2252$$

$$BKB = \bar{\bar{x}} - c\sigma_{\bar{x}} = 58{,}598 - (2 * 1{,}314) = 55{,}9708$$



Gambar Grafik Peta Batas Kelas (Manual) Tinggi Duduk Tegak

Kesimpulan : Seluruh nilai rata-rata subgroup berada di dalam batas kendali BKA dan BKB, maka data telah seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0.05 \sqrt{(100 * 345081) - 5859{,}8^2}}{5859{,}8} \right]^2 = 7{,}96075 \approx 7{,}9608$$

N = 100

N' < N, maka data dikatakan cukup

Tinggi Siku Duduk (TSD)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	16,5	23,2	22	17,5	20	16,8	22,6	23	18	18,5	19,81
2	22,5	21,5	19,5	16,5	16,8	20	23	18,5	19,5	17	19,48
3	18	19	22	19	18,9	18,5	19	21	22	19,5	19,69
4	21	15,6	20	19,5	21	21,6	18	19	20	22	19,77
5	18,5	19	20,5	23	21,5	20	18	17,6	19	21,5	19,86
6	20	16,8	21,5	20,3	20	21,4	20,6	19,5	17,6	20	19,77
7	19	19,5	21,3	20,4	20,6	21,5	16	19,5	18,6	20,5	19,69
8	20,6	21	18,7	17	19	21,3	22,6	20	19,8	18,6	19,86
9	21	20	20,4	18,7	19	21,3	20,5	22,3	17,6	19,4	20,02
10	19,5	20,3	21,5	22	14,5	22,5	14,8	21,6	20,4	19,3	19,64
										Total	197,59
min = 14,5										**Rata-rata**	19,759

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{19{,}81 + 19{,}48 + \ldots + 19{,}64}{10} = 19{,}759$$

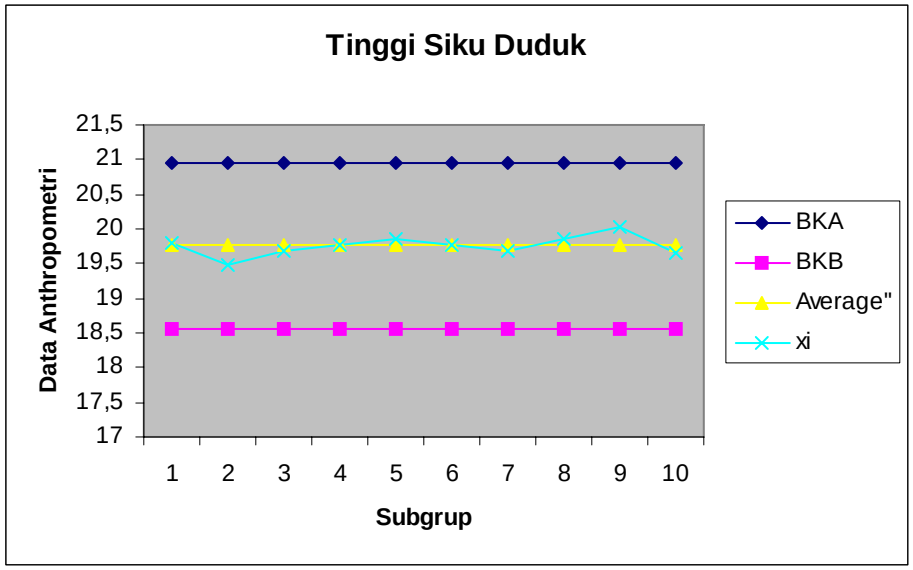
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(16{,}5 - 19{,}759)^2 + (23{,}2 - 19{,}759)^2 + \ldots + (19{,}3 - 19{,}759)^2}{100 - 1}}$$

$$= 1{,}882$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{1{,}882}{\sqrt{10}} = 0{,}595$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{x}} = 19{,}759 + (2 * 0{,}595) = 20{,}949$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{x}} = 19{,}759 - (2 * 0{,}595) = 18{,}569$$



Gambar Grafik Peta Batas Kelas (Manual) Tinggi Siku Duduk

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 39392) - 1975{,}9^2}}{1975{,}9} \right]^2 = 14{,}351 \approx 14{,}35$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 23,2 – 14,5 = 8,7

P_5 = (Range * 5 %) + Data Minimum = (8,7 * 5 %) + 14,5 = 14,935

P_{50} = (Range * 50 %) + Data Minimum = (8,7 * 50 %) + 14,5 = 18,85

P_{95} = (Range * 5 %) + Data Minimum = (8,7* 95 %) + 14,5 = 22,765

Tinggi Mata Duduk (TMD)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	44,5	48	50	52	50,5	43,5	43	49,5	49	50,5	48,05
2	55	53,5	48,3	44,5	48,5	41,5	43,5	51	44,5	50	48,03
3	48	49	48	49,5	45	49	50	43,5	43,5	45	47,05
4	50	50	45	48	50	50	49	43	41,5	51	47,75
5	45,5	47	49	50,3	48	45,6	47,8	50,5	50	45,8	47,95
6	50	44,8	51	46	48	47,6	46	50,8	46,5	47,5	47,82
7	44,8	50,5	45,6	48	47,6	45,4	49	50,3	49,5	48	47,87
8	50,5	48	43,8	47	45,5	48	47	48	56	46	47,98
9	49	44	52	44,9	45,8	51	45	46	56	46	47,97
10	47	46,5	48	50,1	48	50	49	46,8	47	48	48,04
										Total	478,51
										Rata-rata	47,851

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{48{,}05 + 48{,}03 + ... + 48{,}04}{10} = 47{,}851$$

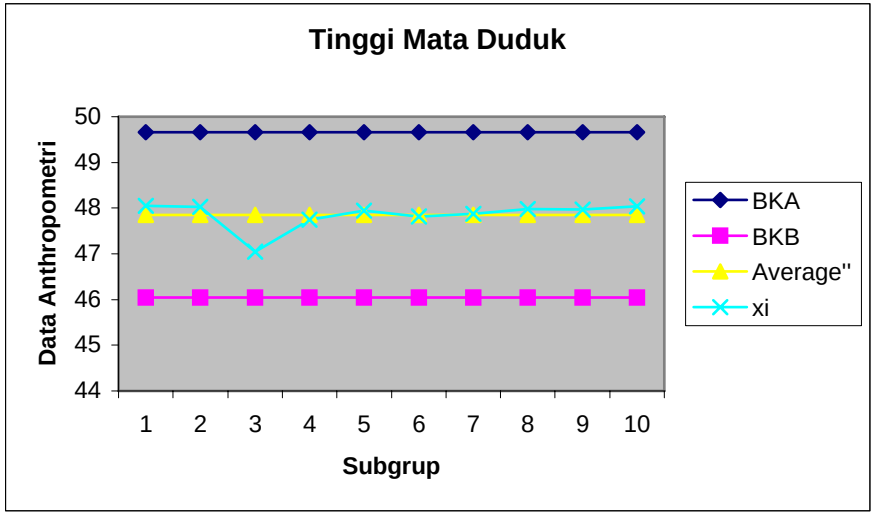
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(44{,}5 - 47{,}851)^2 + (48 - 47{,}851)^2 + ... + (48 - 47{,}851)^2}{100 - 1}}$$

$$= 2{,}854$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{2{,}854}{\sqrt{10}} = 0{,}9025$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{x}} = 47{,}851 + (2 * 0{,}9025) = 49{,}656$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{x}} = 47{,}851 - (2 * 0{,}9025) = 46{,}046$$



Gambar Grafik Peta Batas Kelas (Manual) Tinggi Mata Duduk

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 229778) - 4785{,}1^2}}{4785{,}1} \right]^2 = 5{,}633 \approx 5{,}63$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 56 – 41,5 = 14,5

P_5 = (Range * 5 %) + Data Minimum = (14,5* 5 %) + 41,5 = 42,225

P_{50} = (Range * 50 %) + Data Minimum = (14,5* 50 %) + 41,5 = 48,75

P_{95} = (Range * 5 %) + Data Minimum = (14,5* 95 %) + 41,5 = 55,275

Tinggi Badan Tegak (TBT)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	113	106	101	119	122	107	107,5	112	116	115	111,85
2	116	122	113,5	101,5	110	114	121	114	106	111	112,9
3	114	115	110	113	113	110	112	111	117	112	112,7
4	116	118	116	114	110	115	107	116	114	114	114
5	110,5	115	121	114,5	121	108,5	116	114	117,5	110	114,8
6	112	118,5	115	116,5	113,2	101,8	122	123	106	109	113,7
7	115	114	117	106,3	107,6	111	114	113	108	112,3	111,82
8	111,2	105	118	116	112,5	111	109	103	108	110	110,37
9	112	110,5	113	112,5	110,3	111	110	114	107	109,8	111,01
10	106,4	108,5	106,6	110	113	106	116	115	112,3	110,2	110,4
										Total	1123,55
										Rata-rata	112,355

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{111{,}85 + 112{,}9 + \ldots + 110{,}4}{10} = 112{,}355$$

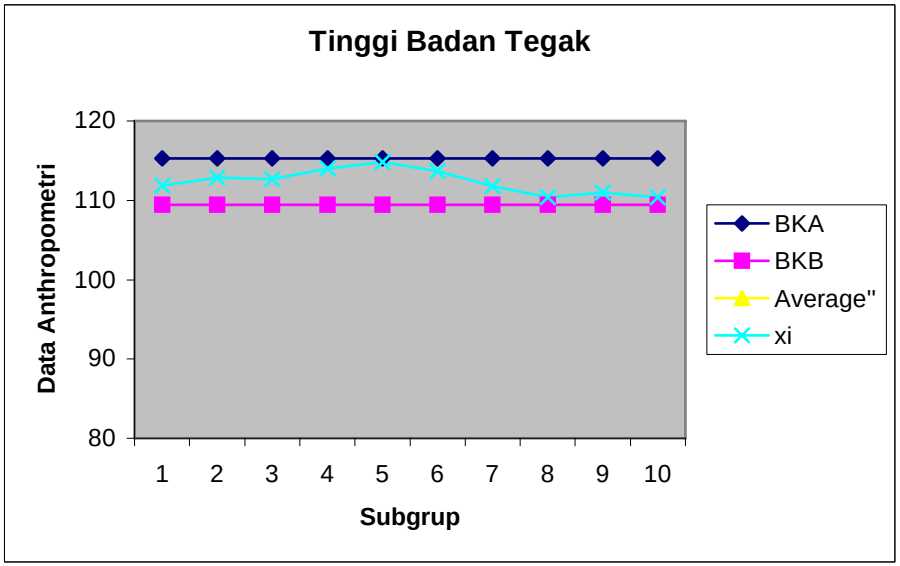
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(113 - 112{,}355)^2 + (106 - 112{,}355)^2 + \ldots + (110{,}2 - 112{,}355)^2}{100 - 1}}$$

$$= 4{,}614$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{4{,}614}{\sqrt{10}} = 1{,}459$$

$$BKA = \bar{\bar{x}} + c\sigma_{\bar{x}} = 112{,}355 + (2 * 1{,}459) = 115{,}273$$

$$BKB = \bar{\bar{x}} - c\sigma_{\bar{x}} = 112{,}355 - (2 * 1{,}459) = 109{,}437$$



Gambar Grafik Peta Batas Kelas (Manual) Tinggi Badan Tegak

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 1264854{,}2) - 11237^2}}{11237} \right]^2 = 2{,}7275 \approx 2{,}73$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 123 – 101= 22

P_5 = (Range * 5 %) + Data Minimum = (22* 5 %) + 101 = 102,1

P_{50} = (Range * 50 %) + Data Minimum = (22* 50 %) + 101 = 112

P_{95} = (Range * 5 %) + Data Minimum = (22* 95 %) + 101 = 121,9

Tinggi Bahu Duduk (TBD)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	33	33,5	37,6	36	39	32	33	36,5	37,5	36,3	35,44
2	38,5	37	36,5	33	34	37	39,5	38	32	33	35,85
3	38	35	35	35,5	33	38	37	37	42	32	36,25
4	37	36	35	35	33	36,5	36	39	42,5	40,5	37,05
5	35	35	38	35	39	33,5	34	36	34,6	33	35,31
6	34	37	34	36	32,5	38	40	39	35	34	35,95
7	36	33	38	36	37	36,5	34,3	35,3	36,6	34,3	35,7
8	35,6	36,2	35	37	35	36,3	39	35	32,8	36	35,79
9	35	36	34,6	35,6	36	38	34,6	38	35,6	33	35,64
10	33,8	34	38	36	35	37	36	34	35	38	35,68
										Total	358,66
										Rata-rata	35,866

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{35{,}44 + 35{,}85 + ... + 35{,}68}{10} = 35{,}866$$

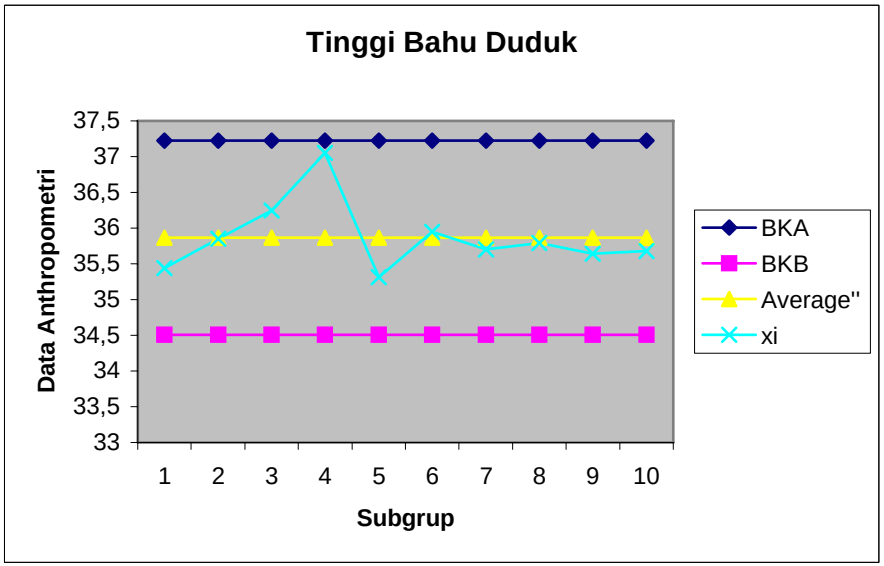
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(33 - 35{,}866)^2 + (33{,}5 - 35{,}866)^2 + ... + (38 - 35{,}866)^2}{100 - 1}}$$

$$= 2{,}1445$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{2{,}1445}{\sqrt{10}} = 0{,}678$$

$$BKA = \bar{\bar{x}} + c\sigma_{\bar{x}} = 35{,}866 + (2 * 0{,}678) = 37{,}22$$

$$BKB = \bar{\bar{x}} - c\sigma_{\bar{x}} = 35{,}866 - (2 * 0{,}678) = 34{,}509$$



Gambar Grafik Peta Batas Kelas (Manual) Tinggi Bahu Duduk

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 129092{,}3) - 3586{,}6^2}}{3586{,}6} \right]^2 = 5{,}663 \approx 5{,}66$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 42,5 – 32= 10,5

P_5 = (Range * 5 %) + Data Minimum = (10,5* 5 %) + 32 = 32,525

P_{50} = (Range * 50 %) + Data Minimum = (10,5* 50 %) + 32 = 37,25

P_{95} = (Range * 5 %) + Data Minimum = (10,5* 95 %) + 32 = 41,975

Tinggi Badan Tegak (TBT)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	113	106	101	119	122	107	107,5	112	116	115	111,85
2	116	122	113,5	101,5	110	114	121	114	106	111	112,9
3	114	115	110	113	113	110	112	111	117	112	112,7
4	116	118	116	114	110	115	107	116	114	114	114
5	110,5	115	121	114,5	121	108,5	116	114	117,5	110	114,8
6	112	118,5	115	116,5	113,2	101,8	122	123	106	109	113,7
7	115	114	117	106,3	107,6	111	114	113	108	112,3	111,82
8	111,2	105	118	116	112,5	111	109	103	108	110	110,37
9	112	110,5	113	112,5	110,3	111	110	114	107	109,8	111,01
10	106,4	108,5	106,6	110	113	106	116	115	112,3	110,2	110,4
										Total	1123,55
										Rata-rata	112,355

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{111{,}85 + 112{,}9 + \ldots + 110{,}4}{10} = 112{,}355$$

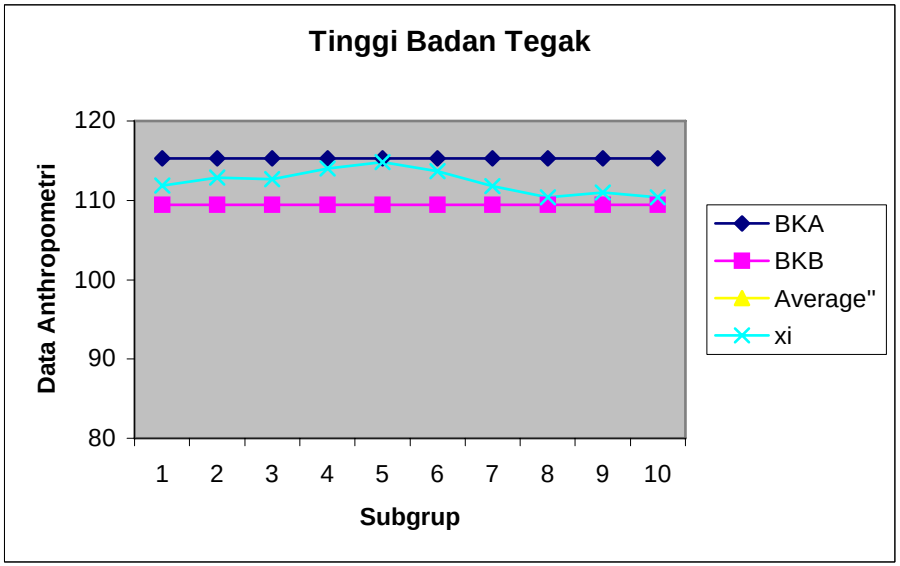
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(113 - 112{,}355)^2 + (106 - 112{,}355)^2 + \ldots + (110{,}2 - 112{,}355)^2}{100 - 1}}$$

$$= 4{,}614$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{4{,}614}{\sqrt{10}} = 1{,}459$$

$$BKA = \bar{\bar{x}} + c\sigma_{\bar{x}} = 112{,}355 + (2 * 1{,}459) = 115{,}273$$

$$BKB = \bar{\bar{x}} - c\sigma_{\bar{x}} = 112{,}355 - (2 * 1{,}459) = 109{,}437$$



Gambar Grafik Peta Batas Kelas (Manual) Tinggi Badan Tegak

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 1264854{,}2) - 11237^2}}{11237} \right]^2 = 2{,}7275 \approx 2{,}73$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 123 – 101= 22

P_5 = (Range * 5 %) + Data Minimum = (22* 5 %) + 101 = 102,1

P_{50} = (Range * 50 %) + Data Minimum = (22* 50 %) + 101 = 112

P_{95} = (Range * 5 %) + Data Minimum = (22* 95 %) + 101 = 121,9

Tinggi Bahu Duduk (TBD)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	33	33,5	37,6	36	39	32	33	36,5	37,5	36,3	35,44
2	38,5	37	36,5	33	34	37	39,5	38	32	33	35,85
3	38	35	35	35,5	33	38	37	37	42	32	36,25
4	37	36	35	35	33	36,5	36	39	42,5	40,5	37,05
5	35	35	38	35	39	33,5	34	36	34,6	33	35,31
6	34	37	34	36	32,5	38	40	39	35	34	35,95
7	36	33	38	36	37	36,5	34,3	35,3	36,6	34,3	35,7
8	35,6	36,2	35	37	35	36,3	39	35	32,8	36	35,79
9	35	36	34,6	35,6	36	38	34,6	38	35,6	33	35,64
10	33,8	34	38	36	35	37	36	34	35	38	35,68
										Total	358,66
										Rata-rata	35,866

Contoh Perhitungan :

$$\bar{x} = \frac{\sum xi}{k} = \frac{35{,}44 + 35{,}85 + ... + 35{,}68}{10} = 35{,}866$$

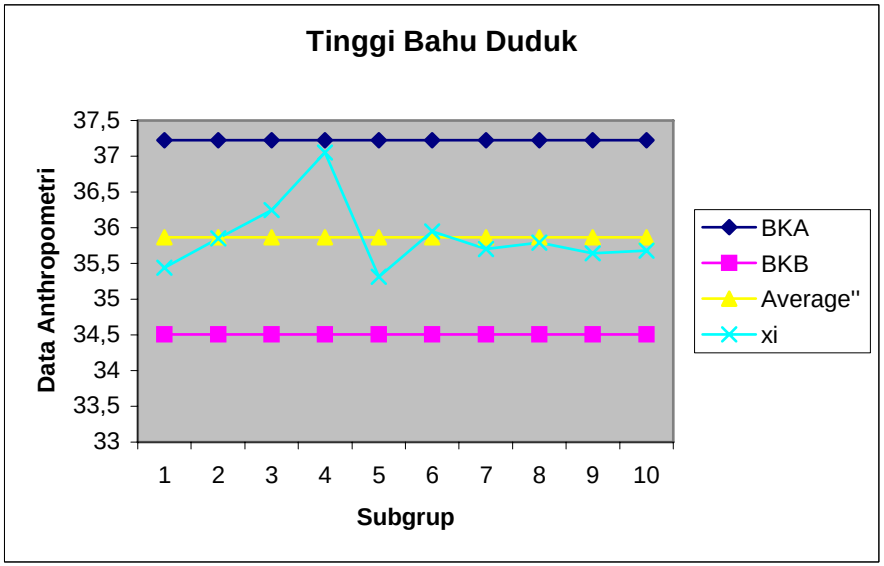
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(33 - 35{,}866)^2 + (33{,}5 - 35{,}866)^2 + ... + (38 - 35{,}866)^2}{100 - 1}}$$

$$= 2{,}1445$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{2{,}1445}{\sqrt{10}} = 0{,}678$$

$$BKA = \bar{\bar{x}} + c\sigma_{\bar{x}} = 35{,}866 + (2 * 0{,}678) = 37{,}22$$

$$BKB = \bar{\bar{x}} - c\sigma_{\bar{x}} = 35{,}866 - (2 * 0{,}678) = 34{,}509$$



Gambar Grafik Peta Batas Kelas (Manual) Tinggi Bahu Duduk

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 129092{,}3) - 3586{,}6^2}}{3586{,}6} \right]^2 = 5{,}663 \approx 5{,}66$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 42,5 – 32= 10,5

P_5 = (Range * 5 %) + Data Minimum = (10,5* 5 %) + 32 = 32,525

P_{50} = (Range * 50 %) + Data Minimum = (10,5* 50 %) + 32 = 37,25

P_{95} = (Range * 5 %) + Data Minimum = (10,5* 95 %) + 32 = 41,975

Tinggi Lutut (TL)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	30	33	31	32	30	33	33,5	33	31,5	33	32
2	29,5	33,5	34	36,5	30	32	29,5	30	35	29,5	31,95
3	31,5	30	36	35	32,5	32	31,5	32	32	31	32,35
4	30	29,5	32,5	36	33	32	32	29	33	32,5	31,95
5	32	32	33	33	34	30	33,5	29,5	33	31,5	32,15
6	30	33	35	33,5	31	31	33	31	33	34	32,45
7	29,5	29	34	34	33	34	31	35,5	28,5	33	32,15
8	31	32,5	32,5	30,5	33,5	36	31	31	31	31	32
9	33	30,5	36	31,5	35	32	29,5	34	30	31	32,25
10	32,5	33	33	35,5	33	32,5	30	32,5	30	32,5	32,45
										Total	321,7
										Rata-rata	32,17

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{32 + 31{,}95 + ... + 32{,}45}{10} = 32{,}17$$

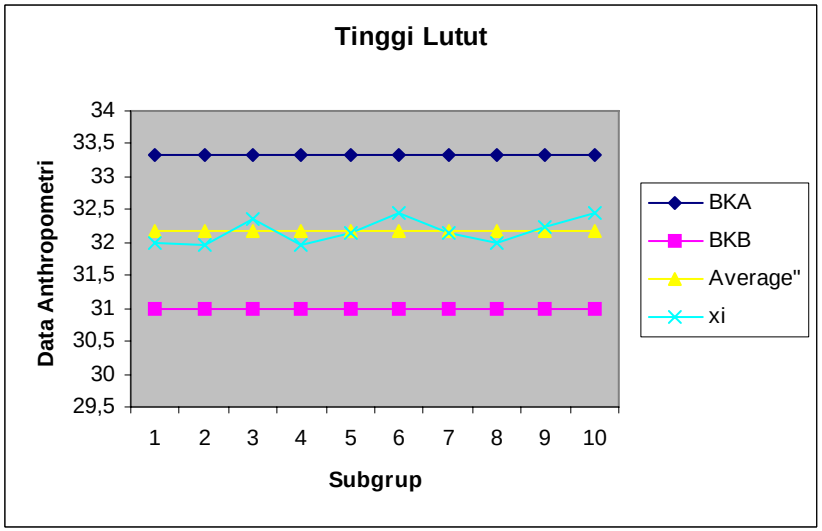
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(30 - 32{,}17)^2 + (33 - 32{,}17)^2 + ... + (32{,}5 - 32{,}17)^2}{100 - 1}}$$

$$= 1{,}845$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{1{,}845}{\sqrt{10}} = 0{,}5834$$

$$BKA = \bar{\bar{x}} + c\sigma_{\bar{x}} = 32{,}17 + (2 * 0{,}5834) = 33{,}337$$

$$BKB = \bar{\bar{x}} - c\sigma_{\bar{x}} = 32{,}17 - (2 * 0{,}5834) = 31{,}003$$



Gambar Grafik Peta Batas Kelas (Manual) Tinggi Lutut

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 103828) - 3217^2}}{3217} \right]^2 = 5{,}2118 \approx 5{,}212$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 36,5 – 28,5 = 8

P_5 = (Range * 5 %) + Data Minimum = (8* 5 %) + 28,5 = 28,9

P_{50} = (Range * 50 %) + Data Minimum = (8* 50 %) + 28,5 = 32,5

P_{95} = (Range * 5 %) + Data Minimum = (8* 95 %) + 28,5 = 36,1

Tinggi Siku Berdiri (TSB)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	69	66	64,5	72	74	66,5	65	67	67,8	71	68,28
2	72	71	66	63,5	66	65	73	73,5	66	65	68,1

3	68	67	67,5	68	66,8	62	67	68	65	65	66,43
4	64	70	72,5	70	68	65	70	65	70	66	68,05
5	69	72	62	69,5	72,5	68,5	66	69	72	72,5	69,3
6	69,5	73,5	70	68	64,5	68	67	65,6	66	68	68,01
7	69,5	69,5	71	73	65	64	63,5	66	68	69	67,85
8	70	71,5	68,5	69,5	66	69	70	72	71	70,5	69,8
9	69	72	71,5	69	68	67,5	66	64,8	65,5	74	68,73
10	71	70	65	68	66	68,5	63,8	65	66,5	66	66,98
										Total	681,53
										Rata-rata	68,153

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{68 + 68{,}1 + ... + 66{,}98}{10} = 68{,}153$$

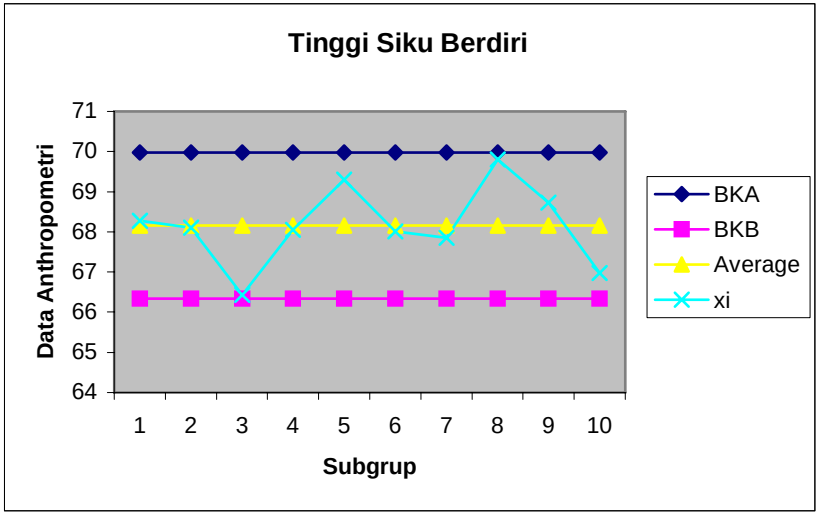
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(69 - 68{,}153)^2 + (66 - 68{,}153)^2 + ... + (66 - 68{,}153)^2}{100 - 1}}$$

$$= 2{,}879$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{2{,}879}{\sqrt{10}} = 0{,}9104$$

$$BKA = \bar{\bar{x}} + c\sigma_{\bar{x}} = 68{,}153 + (2 * 0{,}9104) = 69{,}9738$$

$$BKB = \bar{\bar{x}} - c\sigma_{\bar{x}} = 68{,}153 - (2 * 0{,}9104) = 66{,}332$$



Gambar Grafik Peta Batas Kelas (Manual) Tinggi Siku Berdiri

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 465304) - 6815{,}3^2}}{6815{,}3} \right]^2 = 2{,}8276 \approx 2{,}828$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 74 – 62 = 12

P_5 = (Range * 5 %) + Data Minimum = (12* 5 %) + 62 = 62,6

P_{50} = (Range * 50 %) + Data Minimum = (12* 50 %) + 62 = 68

P_{95} = (Range * 5 %) + Data Minimum = (12* 95 %) + 62 = 73,4

Jangkauan Tangan (JT)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	51	41	42	44	50	43	47	44	46	46	45,4
2	45	47	44	42,3	43	43,5	44,5	52	52	42	45,53
3	45	42	48	46	46	48	45	45	46	44	45,5
4	45	44	45,5	42	48	47,5	47	45	49	44	45,7
5	48,5	47	46	44	41,5	46	48,5	42	49	45,5	45,8
6	49	46,5	45	44	40	45	46	46,5	45	49	45,6
7	44	47	47	47	48	47	45	44	43	47	45,9
8	43	42	49	50,5	43,5	50,5	42,5	44	44,5	45	45,45
9	44,5	45	50	46,5	48	49	47,5	45	40	41	45,65
10	41	46	50	46,5	47,5	40	50	48,5	46	40,5	45,6
										Total	456,13
										Rata-rata	45,613

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{45{,}4 + 45{,}53 + ... + 45{,}6}{10} = 45{,}613$$

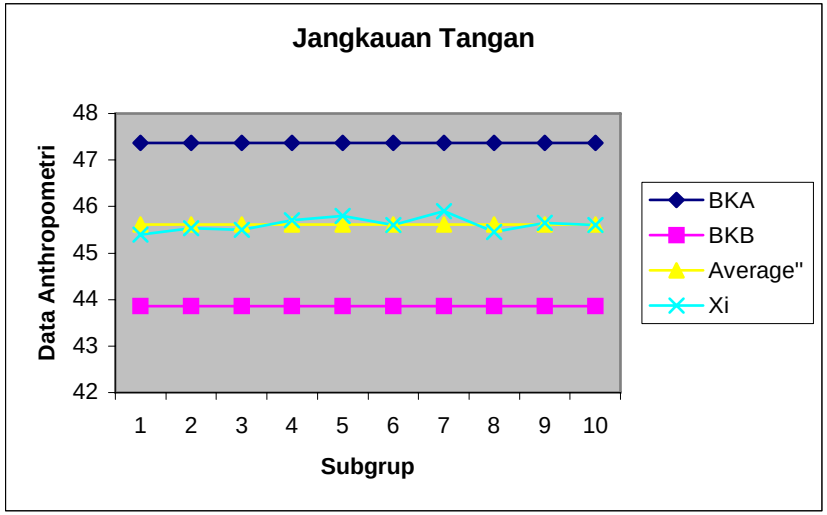
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(51 - 45{,}613)^2 + (41 - 45{,}613)^2 + ... + (40{,}5 - 45{,}613)^2}{100 - 1}}$$

$$= 2{,}778$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{2{,}778}{\sqrt{10}} = 0{,}8786 \approx 0{,}88$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 45{,}613 + (2 * 0{,}8786) = 47{,}37$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 45{,}613 - (2 * 0{,}8786) = 43{,}856$$



Gambar Grafik Peta Batas Kelas (Manual) Jangkauan Tangan

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 208818{,}79) - 4561{,}3^2}}{4561{,}3} \right]^2 = 5{,}877 \approx 5{,}88$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 52 – 40 = 12

P_5 = (Range * 5 %) + Data Minimum = (12* 5 %) + 40 = 40,6

P_{50} = (Range * 50 %) + Data Minimum = (12* 50 %) + 40 = 46

P_{95} = (Range * 5 %) + Data Minimum = (12* 95 %) + 40 = 51,4

Tinggi Duduk Tegak (TDT)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	55	59	54	62	66	56	54	58	65	60,5	58,95
2	65	57	64	54,5	59	62	50,5	63	59	55	58,9
3	62	59	59	62,5	55	60	60	56	62	54	58,95
4	59	56	57	59	54	60	59	64	64	57	58,9
5	57,5	58	50	59	62	55	58,5	60	65,5	57,5	58,3
6	61	52,5	54	60	58,3	55	53,5	63,5	59,5	66	58,33
7	50,5	53	57,5	65	59,6	52	56,5	64	65,5	59,8	58,34
8	64,5	53	66	58	57,5	56	61	51,5	52	63	58,25
9	52,5	56	62,5	57	53,5	59	63	60,5	64	60	58,8
10	51,6	55	59,5	65	60,4	57	52,6	62	58	61,5	58,26
										Total	585,98
										Rata-rata	58,598

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{58{,}95 + 58{,}9 + \ldots + 58{,}26}{10} = 58{,}598$$

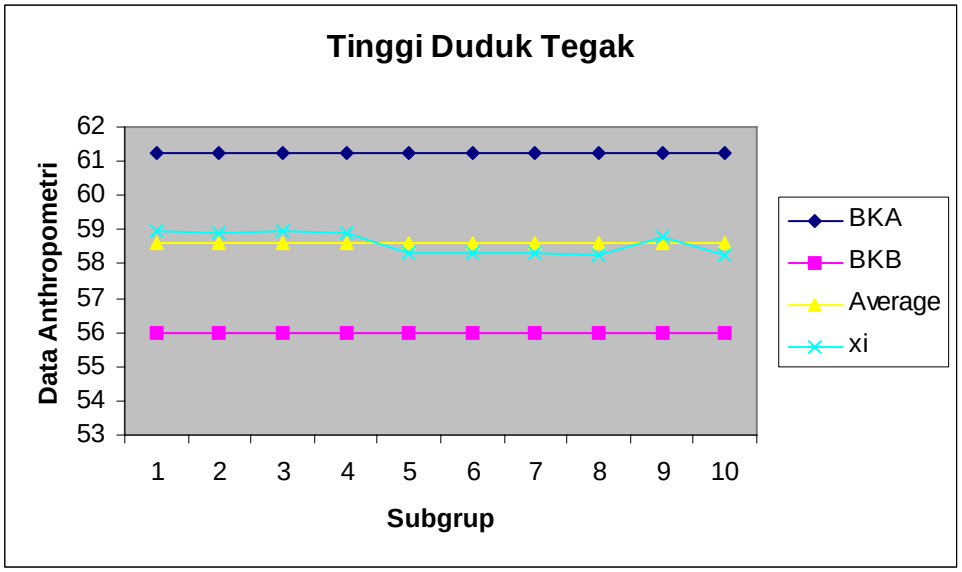
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(55 - 58{,}598)^2 + (59 - 58{,}598)^2 + \ldots + (61{,}5 - 58{,}598)^2}{100 - 1}}$$

$$= 4{,}154$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{4{,}154}{\sqrt{10}} = 1{,}3136 \approx 1{,}314$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 58{,}598 + (2 * 1{,}314) = 61{,}2252$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 58{,}598 - (2 * 1{,}3136) = 55{,}9708$$



Gambar Grafik Peta Batas Kelas (Manual) Tinggi Duduk Tegak

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 345081) - 5859{,}8^2}}{5859{,}8} \right]^2 = 7{,}96075 \approx 7{,}961$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 66 – 50 = 16

P_5 = (Range * 5 %) + Data Minimum = (16* 5 %) + 50 = 50,8

P_{50} = (Range * 50 %) + Data Minimum = (16* 50 %) + 50 = 58

P_{95} = (Range * 5 %) + Data Minimum = (16* 95 %) + 50 = 65,2

Lebar Bahu (LB)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	30	36,7	31,5	30	33	36,5	35	30	31,5	32	32,62
2	33	32	31	33,5	36,8	35,5	34	31,5	29	31,6	32,79
3	34	35	31,8	34	30,6	33,5	29,5	30,8	32,5	34,5	32,62
4	30,8	31,5	33	34	28,8	34	33,5	34,2	33	34,5	32,73
5	33,2	30,5	31,5	30,8	31	36	35,5	34	33,5	30,8	32,68
6	31,6	32,5	33	34	30	36,5	31,5	35,2	32,3	29,8	32,64
7	36	29	32,5	33	34,5	36	32	32,5	31,8	29	32,63
8	35	30,5	31	34	35	34	33	32,5	30,8	31,8	32,76
9	31,8	34	33	29	32,6	34,5	28,8	35,8	35	33	32,75
10	31,5	32	31,6	30,8	32,3	36	33	35,3	32,4	30	32,49
										Total	326,71
										Rata-rata	32,671

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{32{,}62 + 32{,}79 + ... + 32{,}49}{10} = 32{,}671$$

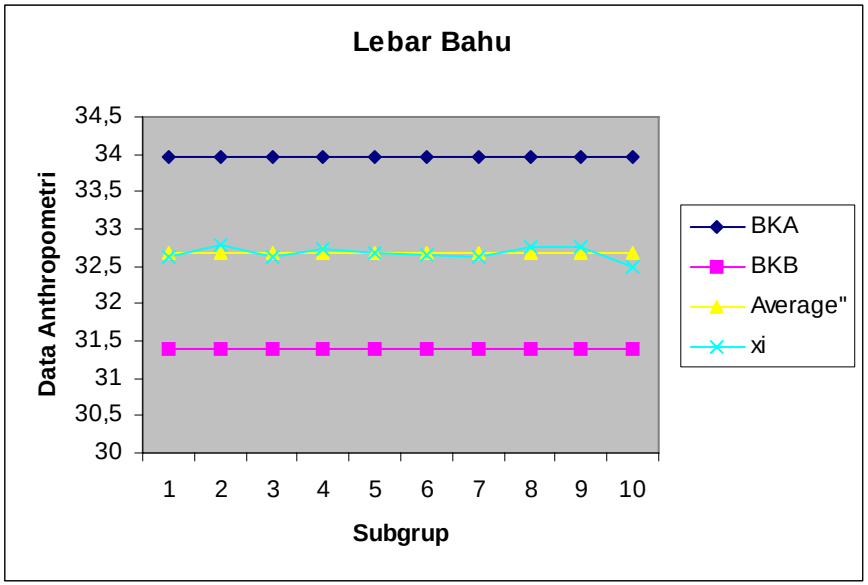
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(30 - 32{,}671)^2 + (36{,}7 - 32{,}671)^2 + ... + (30 - 32{,}671)^2}{100 - 1}}$$

$$= 2{,}035$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{2{,}035}{\sqrt{10}} = 0{,}6435 \approx 0{,}644$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 32{,}671 + (2 * 0{,}644) = 33{,}958$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 32{,}671 - (2 * 0{,}644) = 31{,}384$$



Gambar Grafik Peta Batas Kelas (Manual) Lebar Bahu

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 107149{,}4) - 3267{,}1^2}}{3267{,}1} \right]^2 = 6{,}1454 \approx 6{,}145$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 36,8 – 28,8 = 8

P_5 = (Range * 5 %) + Data Minimum = (8* 5 %) + 28,8 = 29,2

P_{50} = (Range * 50 %) + Data Minimum = (8* 50 %) + 28,8 = 32,8

P_{95} = (Range * 5 %) + Data Minimum = (8* 95 %) + 28,8 = 36,4

Lebar Sandaran (LS)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	13,5	14	11	16	16	11	10	11	11	12	12,55
2	14	15	11	15	13	14	15	10	9	9	12,5
3	12,5	9,8	9	15	10,8	12	15	12	14	13,5	12,36
4	13	14,5	10	11	10	12,5	10	12	16	16	12,5
5	15	12	11	12,5	14	13,6	11,6	12	10,8	11	12,35
6	11,5	12,6	11	15	11,5	13,5	10,5	14,6	12	11,6	12,38
7	13	9,8	15,5	14	12,5	10,3	11	13,2	11,8	12,5	12,36
8	9,8	14	14	11,5	10,3	12,5	13,4	11	15,6	12,5	12,46
9	10,5	12	15	13,5	13,5	10,8	12	14	11,8	12	12,51
10	10,6	12,4	15,5	16	12,5	10,5	11,5	12,5	12	11	12,45
										Total	124,42
										Rata-rata	12,442

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{12{,}55 + 12{,}5 + ... + 12{,}45}{10} = 12{,}442$$

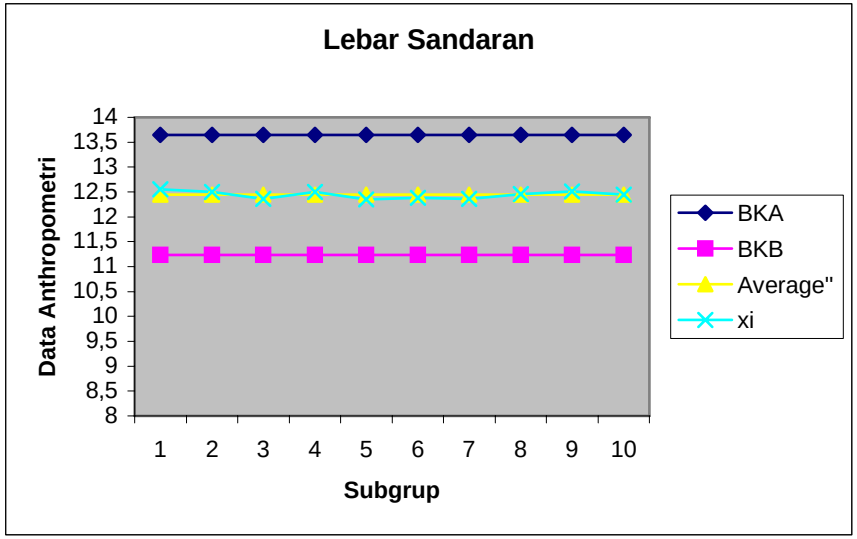
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(13{,}5 - 12{,}442)^2 + (14 - 12{,}442)^2 + ... + (11 - 12{,}442)^2}{100 - 1}}$$

$$= 1{,}9098$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{1{,}9098}{\sqrt{10}} = 0{,}60393 \approx 0{,}604$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 12{,}442 + (2 * 0{,}604) = 13{,}6499 \approx 13{,}65$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 12{,}442 - (2 * 0{,}604) = 11{,}234$$



Gambar Grafik Peta Batas Kelas (Manual) Lebar Sandaran

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 15677{,}2) - 1237{,}6^2}}{1237{,}6} \right]^2 = 37{,}676 \approx 37{,}68$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 16 – 9 = 7

P_5 = (Range * 5 %) + Data Minimum = (7* 5 %) + 9 = 9,35

P_{50} = (Range * 50 %) + Data Minimum = (7* 50 %) + 9 = 12,5

P_{95} = (Range * 5 %) + Data Minimum = (7* 95 %) + 9 = 15,65

Jarak Siku Ke Jari Tengah (JST)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	26	26	25	28	30	25	28,5	26,5	27	27	26,9
2	26	27	27	33	26,5	26	24,5	28,5	25	26	26,95
3	25	25	31,5	25	31	27	26,5	24,5	26	25	26,65
4	26	27	23,5	29,5	30	28,5	29,5	24,5	29	28	27,55
5	29	28	29	26	28,5	27	29,5	25,5	30	26,5	27,9
6	29	27,5	27,5	31	23	27	28	29	30	29,5	28,15
7	26	26	30	29,5	30	27	28	29	27,5	29,5	28,25
8	32	24,5	26,5	27,5	25	28,5	27	30,5	26	27	27,45
9	26	27	29,5	26,5	26,5	28,5	25	26,5	25	30,5	27,1
10	22	27,5	28,5	28	29	29,5	30	29,5	29,5	27	28,05
										Total	274,95
										Rata-rata	27,495

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{26{,}9 + 26{,}95 + ... + 28{,}05}{10} = 27{,}495$$

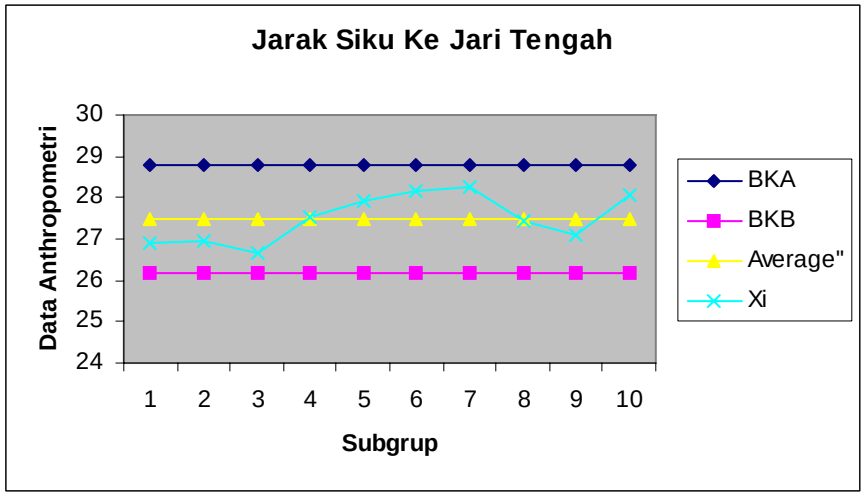
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(26 - 27{,}495)^2 + (26 - 27{,}495)^2 + ... + (27 - 27{,}495)^2}{100 - 1}}$$

$$= 2{,}07$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{2{,}07}{\sqrt{10}} = 0{,}6546 \approx 0{,}655$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 27{,}495 + (2 * 0{,}6546) = 28{,}804$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 27{,}495 - (2 * 0{,}6546) = 26{,}186$$



Gambar Grafik Peta Batas Kelas (Manual) Jarak Siku Ke Jari Tengah

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 76021{,}75) - 2749{,}5^2}}{2749{,}5} \right]^2 = 8{,}979 \approx 8{,}98$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 33 – 22 = 11

P_5 = (Range * 5 %) + Data Minimum = (11 * 5 %) + 22 = 22,55

P_{50} = (Range * 50 %) + Data Minimum = (11 * 50 %) + 22 = 27,5

P_{95} = (Range * 5 %) + Data Minimum = (11* 95 %) + 22 = 32,45

Jarak Siku Ke Jari Telunjuk (JSTJ)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	27	25	24,5	26	29	24,5	27	24,5	27,5	26,5	26,15
2	29	25	26	32	26	25,5	24	28	24,5	25	26,5
3	26	24,5	29,5	24	32	26	24	24	25	29	26,4
4	25	26,5	23	28,5	28,5	27,5	28	24	28	27	26,6
5	28	28	28	25,5	27,5	26,5	27,5	24,5	24	26	26,55
6	28	27	26,5	24	24	26	26,5	28	28	29	26,7
7	24,5	25	28,5	28,5	29,5	26	27	28	26,5	26	26,95
8	22	30,5	25,5	26,5	29,5	28	26	30	25,5	26,5	27
9	25,5	26,5	28,5	26	26	27,5	26	25	23	29	26,3
10	21,5	26	27,5	27	28,5	28	23	27	28,5	28,5	26,55
										Total	265,7
										Rata-rata	26,57

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{26{,}15 + 26{,}5 + ... + 26{,}55}{10} = 26{,}57$$

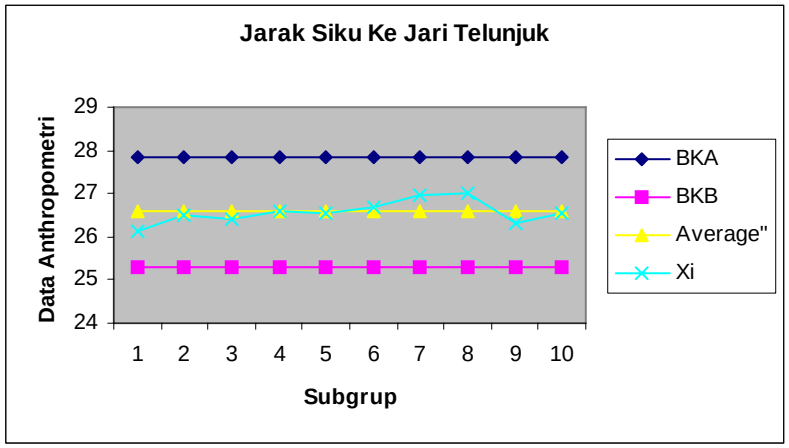
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(27 - 26{,}57)^2 + (25 - 26{,}57)^2 + ... + (28{,}5 - 26{,}57)^2}{100 - 1}}$$

$$= 2{,}018$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{2{,}018}{\sqrt{10}} = 0{,}63809 \approx 0{,}638$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{x}} = 26{,}57 + (2 * 0{,}63809) = 27{,}846$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{x}} = 26{,}57 - (2 * 0{,}63809) = 25{,}294$$



Gambar Grafik Peta Batas Kelas (Manual) Jarak Siku Ke Jari Telunjuk

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 71159) - 2660^2}}{2660} \right]^2 = 9{,}113$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 32 – 21,5 = 10,5

P_5 = (Range * 5 %) + Data Minimum = (10,5 * 5 %) + 21,5 = 22,025

P_{50} = (Range * 50 %) + Data Minimum = (10,5 * 50 %) + 21,5 = 26,75

P_{95} = (Range * 5 %) + Data Minimum = (10,5 * 95 %) + 21,5 = 31,475

Jarak Siku Ke Ibu Jari (JSIJ)

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	22	25,5	21	23,5	24	25	23	22,8	23	22	23,18
2	22	26,5	22	25,5	22	21	26	25	22	22	23,4
3	25,5	25	23	22	21	25	22	21,5	23	23	23,1
4	23	23,5	20	24	24	24,5	24,5	21	25	23	23,25
5	25	25	24	24,5	25	23,5	24,5	21,5	21	23	23,7
6	21	24	24	25,5	20	22,5	24	24	25	25	23,5
7	22	25	24	25	24,5	23,5	24	23,5	20,5	24	23,6
8	21	26	22,5	23,5	25	25	22,5	25	21,5	22,5	23,45
9	22,7	22,5	23	23	23	24,5	23	21,5	23	25,5	23,17
10	20	24	24	24	20,5	25,5	25,5	24,5	23,5	25	23,65
										Total	234
										Rata-rata	23,4

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{23{,}18 + 23{,}4 + ... + 23{,}65}{10} = 23{,}4$$

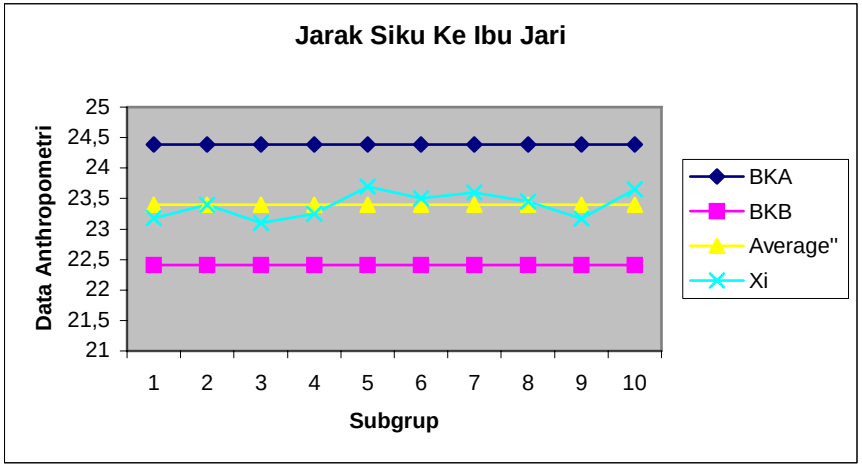
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(22 - 23{,}4)^2 + (25{,}5 - 23{,}4)^2 + ... + (25 - 23{,}4)^2}{100 - 1}}$$

$$= 1{,}561$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{1{,}561}{\sqrt{10}} = 0{,}4938 \approx 0{,}494$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 23{,}4 + (2 * 0{,}4938) = 24{,}388$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 23{,}4 - (2 * 0{,}4938) = 22{,}412$$



Gambar Grafik Peta Batas Kelas (Manual) Jarak Siku Ke Ibu Jari

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 54997{,}38) - 2340^2}}{2340} \right]^2 = 7{,}053$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 26,5 – 20 = 6,5

P_5 = (Range * 5 %) + Data Minimum = (6,5 * 5 %) + 20 = 20,325

P_{50} = (Range * 50 %) + Data Minimum = (6,5 * 50 %) + 20 = 23,25

P_{95} = (Range * 5 %) + Data Minimum = (6,5 * 95 %) + 20 = 26,175

Jarak Siku Ke Pergelangan Tangan (JSPT)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	14,5	19	17	15	18	19	17	15	16	15	16,55
2	16	18,5	15	18,5	16	16	14	18,5	17	15,8	16,53
3	19	15	17,5	15	16	17	16	17,5	17	16	16,6
4	16	16	18	17	15,5	17,5	15	16	17,5	20	16,85
5	14	17,5	16,5	17,5	17	19	17,5	15	17,5	17	16,85
6	18	17,5	17	17	14	15,5	17	16	17	17	16,6
7	16	16	17	18	18	15	16	16,5	16,5	18,5	16,75
8	18	14	17	14	18,5	18	16	17,5	15	18	16,6
9	15	17,5	15,5	17	17,5	18,5	14	17,5	16	19	16,75
10	15	17,5	16	17,5	17	17	17	17	16,5	17	16,75
										Total	166,83
										Rata-rata	16,683

Contoh Perhitungan :

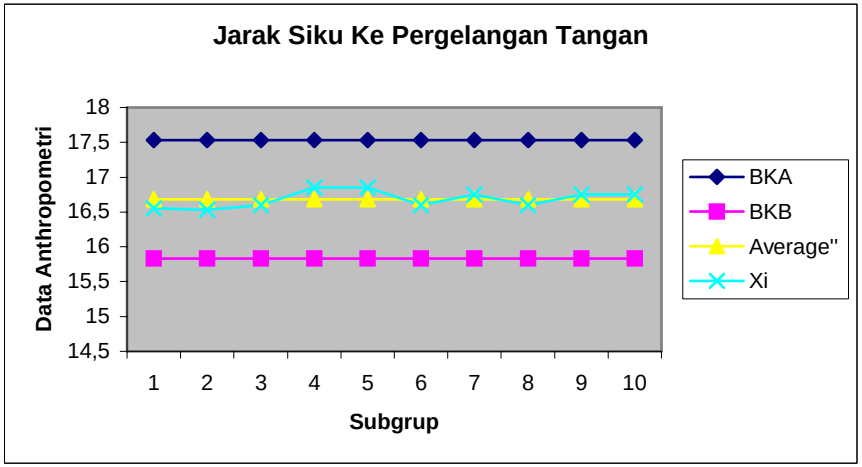
$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{16{,}55 + 16{,}53 + \ldots + 16{,}75}{10} = 16{,}683$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N-1}} = \sqrt{\frac{(14{,}5 - 16{,}683)^2 + (19 - 16{,}683)^2 + \ldots + (17 - 16{,}683)^2}{100 - 1}} = 1{,}343$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{1{,}343}{\sqrt{10}} = 0{,}4248 \approx 0{,}425$$

$$BKA = \bar{\bar{x}} + c\sigma_{\bar{x}} = 16{,}683 + (2 * 0{,}425) = 17{,}533$$

$$BKB = \bar{\bar{x}} - c\sigma_{\bar{x}} = 16{,}683 - (2 * 0{,}425) = 15{,}833$$



Gambar Grafik Peta Batas Kelas (Manual) Jarak Siku Ke Pergelangan Tangan

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 28010{,}89) - 1668{,}3^2}}{1668{,}3} \right]^2 = 10{,}2696 \approx 10{,}27$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 20 – 14 = 6

P_5 = (Range * 5 %) + Data Minimum = (6 * 5 %) + 14 = 14,3

P_{50} = (Range * 50 %) + Data Minimum = (6 * 50 %) + 14 = 17

P_{95} = (Range * 5 %) + Data Minimum = (6 * 95 %) + 14 = 19,7

Lebar Tangan Dengan Ibu Jari (LTIJ)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	6	7,5	7,3	8	9,3	6	6,5	9	8,5	8,5	7,66
2	9	8	8	7,5	8	6	9	8	6,5	7,5	7,75
3	8	9	6,5	8	8	7,5	8,5	7	9	7	7,85
4	7	7	7,5	7,5	7	7,5	8	8	9,5	9,5	7,85
5	8,5	6,8	8	7,5	8	8,6	9,5	8	7,5	7	7,94
6	7	6,4	8	9	8,3	8,5	8	8,5	8,5	7	7,92
7	7,5	7	6,3	7,5	7,5	8,5	9	8,5	9	8,9	7,97
8	8	8,5	9	7	7,5	8	7,6	7,3	7,8	7,5	7,82
9	8	6,7	8,5	7	8	8	8,5	8,5	6,5	9	7,87
10	9	9,5	8	8,3	8,5	8	6,5	6,3	8,3	7,2	7,96
										Total	78,59
										Rata-rata	7,859

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{7,66 + 7,75 + ... + 7,96}{10} = 7,859$$

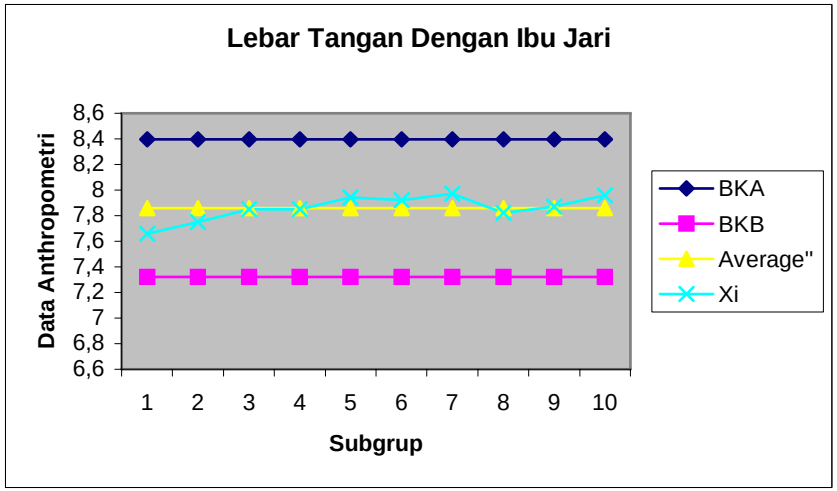
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(6 - 7,859)^2 + (7,5 - 7,859)^2 + ... + (7,2 - 7,859)^2}{100 - 1}}$$

$$= 0,848$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{0,848}{\sqrt{10}} = 0,268$$

$$BKA = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 7,859 + (2 * 0,268) = 8,395$$

$$BKB = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 7{,}859 - (2 * 0{,}268) = 7{,}323$$



Gambar Grafik Peta Batas Kelas (Manual) Lebar Tangan Dengan Ibu Jari

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 6373{,}35) - 793{,}9^2}}{793{,}9} \right]^2 = 17{,}917 \approx 17{,}92$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 9,5 – 6 = 3,5

P_5 = (Range * 5 %) + Data Minimum = (3,5 * 5 %) + 6 = 6,175

P_{50} = (Range * 50 %) + Data Minimum = (3,5 * 50 %) + 6 = 7,75

P_{95} = (Range * 5 %) + Data Minimum = (3,5 * 95 %) + 6 = 9,325

Lebar Jari Telunjuk (LTJ)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	0,7	1	0,8	0,9	1,3	1,14	1	1,15	1,05	1,12	1,016
2	1,35	1,25	1,05	0,85	1,05	0,75	1,15	0,95	1,25	0,85	1,05
3	1,1	0,9	1,05	0,7	1,02	1,12	0,8	1,3	1,02	1,2	1,021
4	1,4	0,75	1,05	0,95	1,05	0,85	0,95	1,25	0,95	1,15	1,035
5	1,03	1,12	0,75	1,25	1,13	0,9	1,15	1,03	1,12	0,7	1,018
6	1,12	0,85	1,15	1,05	0,85	1,3	1	0,8	1,15	0,95	1,022
7	1,2	0,7	0,95	1,12	0,8	1,15	1,1	0,85	1,26	1,02	1,015
8	0,95	1,2	0,75	1,25	1	1,05	0,9	1,05	0,85	1,15	1,015
9	1,02	0,8	1,1	0,95	1,12	0,7	1,12	1,3	0,85	1,2	1,016
10	1,12	1,25	1	1,15	0,8	1,05	0,85	0,75	1,2	1	1,017
										Total	10,225

Rata-rata	1,0225

Contoh Perhitungan :

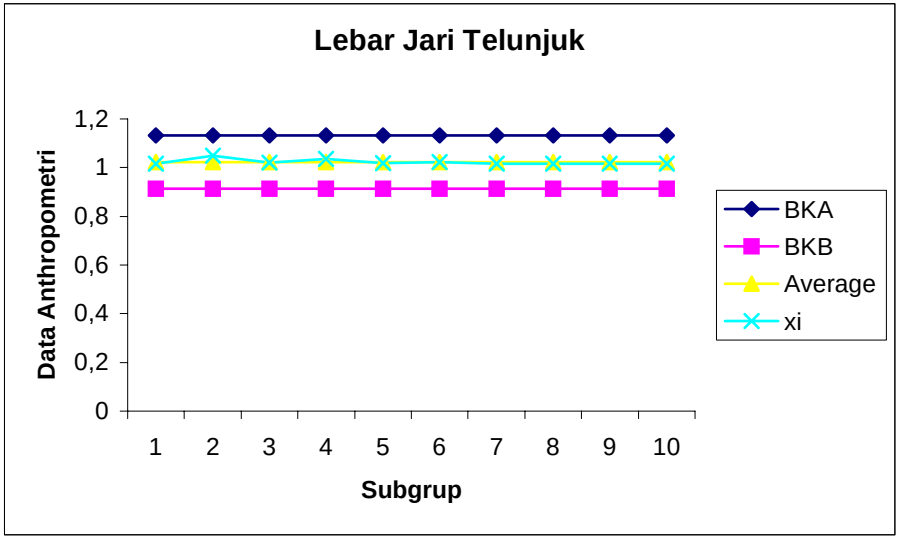
$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{1{,}016 + 1{,}05 + \ldots + 1{,}017}{10} = 1{,}0225$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N-1}} = \sqrt{\frac{(0{,}7 - 1{,}0225)^2 + (1 - 1{,}0225)^2 + \ldots + (1 - 1{,}0225)^2}{100 - 1}} = 0{,}172$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{0{,}172}{\sqrt{10}} = 0{,}0544 \approx 0{,}054$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 1{,}0225 + (2 * 0{,}0544) = 1{,}131$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 1{,}0225 - (2 * 0{,}0544) = 0{,}914$$



Gambar Grafik Peta Batas Kelas (Manual) Lebar Jari Telunjuk

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 107{,}4771) - 102{,}25^2}}{102{,}25} \right]^2 = 44{,}7855 \approx 45$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 1,4– 0,65 = 0,75

P_5 = (Range * 5 %) + Data Minimum = (0,75 * 5 %) + 1,4 = 1,4375

P_{50} = (Range * 50 %) + Data Minimum = (0,75 * 50 %) + 1,4 = 1,775

P_{95} = (Range * 5 %) + Data Minimum = (0,75 * 95 %) + 1,4 = 2,1125

Lebar Jari Tengah (LJT)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	1,2	0,8	1,5	1,26	0,85	0,8	1,25	1,5	0,9	1,35	1,141
2	1	1,1	0,98	1,3	1,35	1,3	0,9	1,1	1,3	1,05	1,138
3	1,1	1,2	1,3	0,8	0,7	1,5	1,4	1,1	1,4	0,8	1,13
4	0,8	1,1	1,28	1,1	1,1	1	1,15	1,8	0,9	1	1,123
5	1,16	0,9	1,2	1,35	0,8	0,8	1,28	1,4	0,9	1,5	1,129
6	0,75	1,2	1,15	1,4	1,14	0,9	0,9	1,4	1,2	1,25	1,129
7	1,3	1	1	1,2	1,1	1,2	1,14	1,1	1,12	1,28	1,144
8	1,3	1,45	1,3	1,4	1,35	1	1,15	0,9	1	0,98	1,183
9	1,3	1,15	1,15	1,25	1,2	0,9	1	1,28	1	1,2	1,143
10	1,28	1,3	1,14	1,15	1,14	1,5	0,75	1,12	0,7	1,35	1,143

Total	11,403
Rata-rata	1,1403

Contoh Perhitungan :

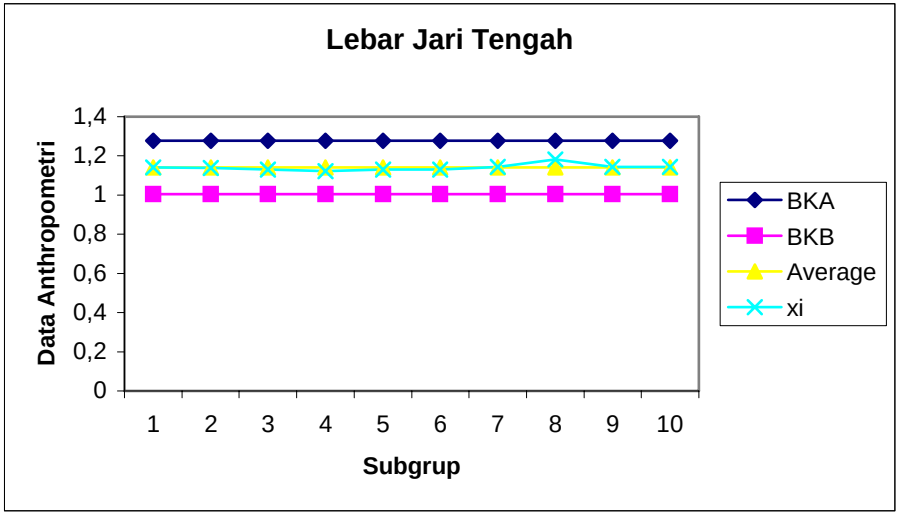
$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{1{,}141 + 1{,}138 + \ldots + 1{,}143}{10} = 1{,}1403$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N-1}} = \sqrt{\frac{(1{,}2 - 1{,}1403)^2 + (0{,}8 - 1{,}1403)^2 + \ldots + (1{,}35 - 1{,}1403)^2}{100-1}} = 0{,}2149$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{0{,}2149}{\sqrt{10}} = 0{,}0679 \approx 0{,}068$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 1{,}1403 + (2 * 0{,}068) = 1{,}276$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 1{,}1403 - (2 * 0{,}068) = 1{,}004$$



Gambar Grafik Peta Batas Kelas (Manual) Lebar Jari Tengah

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 134{,}6007) - 114{,}03^2}}{114{,}03} \right]^2 = 56{,}262 \approx 57$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 1,8– 0,7 = 1,1

P_5 = (Range * 5 %) + Data Minimum = (1,1 * 5 %) + 1,8 = 1,855

P_{50} = (Range * 50 %) + Data Minimum = (1,1 * 50 %) + 1,8 = 2,35

P_{95} = (Range * 5 %) + Data Minimum = (1,1 * 95 %) + 1,8 = 2,845

Panjang Telapak Tangan (PTT)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	8,5	11	12,5	10	12,5	13	11,5	9,5	13,6	12,5	11,46
2	10,5	9	12,5	11,5	13,6	9,5	12	13	11,5	12	11,51
3	11	13	8,5	12,5	11	13,8	10,5	13	12,5	9,5	11,53
4	12	10	11	9	13	11	13,6	13,6	11	12	11,62
5	11	13	11	12	14,5	9	12	10	13,6	12	11,81
6	8,5	13	13,6	10,5	12,5	11	13	11	10	12,5	11,56
7	11,5	12	9	11	12,5	10	13	11	13,8	15	11,88
8	11,5	10	12	13,5	8,5	12,5	13,7	9,5	12,5	11	11,47
9	11	13,7	9,5	12	10	13	11	10	13	12	11,52
10	10	13	12	11	14,5	12	9	14	12	11	11,85
										Total	116,21
										Rata-rata	11,621

Contoh Perhitungan :

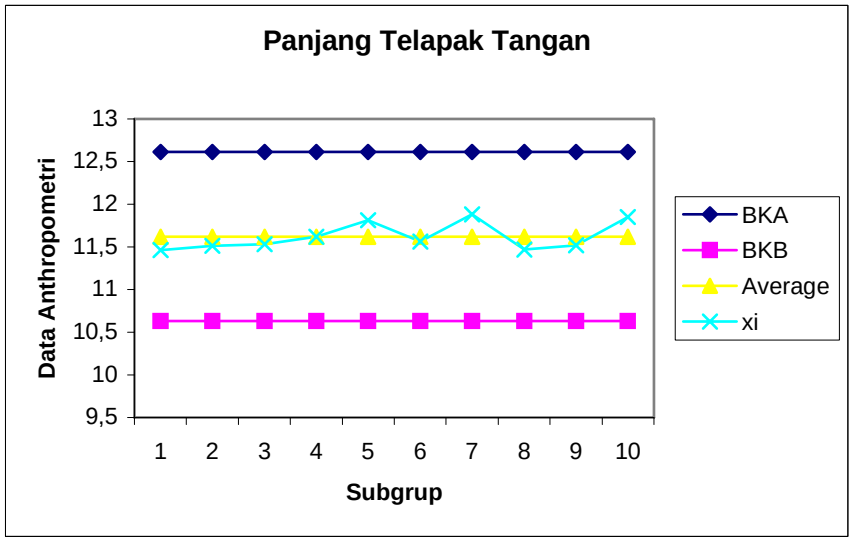
$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{11{,}46 + 11{,}51 + \ldots + 11{,}85,}{10} = 11{,}621$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N-1}} = \sqrt{\frac{(8{,}5 - 11{,}621)^2 + (11 - 11{,}621)^2 + \ldots + (11 - 11{,}621)^2}{100 - 1}} = 1{,}563$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{1{,}563}{\sqrt{10}} = 0{,}4944 \approx 0{,}494$$

$$BKA = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 11{,}621 + (2 * 0{,}4944) = 12{,}6098$$

$$BKB = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 11{,}621 - (2 * 0{,}4944) = 10{,}6321$$



Gambar Grafik Peta Batas Kelas (Manual) Panjang Telapak Tangan

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 13746{,}77) - 1162{,}1^2}}{1162{,}1} \right]^2 = 28{,}672 \approx 29$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 15– 8= 7

P_5 = (Range * 5 %) + Data Minimum = (7 * 5 %) + 15 = 15,35

P_{50} = (Range * 50 %) + Data Minimum = (7 * 50 %) + 15 = 18,5

P_{95} = (Range * 5 %) + Data Minimum = (7 * 95 %) + 15 = 21,65

Lebar Tangan Dengan Ibu Jari (LTIJ)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	6	7,5	7,3	8	9,3	6	6,5	9	8,5	8,5	7,66
2	9	8	8	7,5	8	6	9	8	6,5	7,5	7,75
3	8	9	6,5	8	8	7,5	8,5	7	9	7	7,85
4	7	7	7,5	7,5	7	7,5	8	8	9,5	9,5	7,85
5	8,5	6,8	8	7,5	8	8,6	9,5	8	7,5	7	7,94
6	7	6,4	8	9	8,3	8,5	8	8,5	8,5	7	7,92
7	7,5	7	6,3	7,5	7,5	8,5	9	8,5	9	8,9	7,97
8	8	8,5	9	7	7,5	8	7,6	7,3	7,8	7,5	7,82
9	8	6,7	8,5	7	8	8	8,5	8,5	6,5	9	7,87
10	9	9,5	8	8,3	8,5	8	6,5	6,3	8,3	7,2	7,96
										Total	78,59
										Rata-rata	7,859

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{7,66 + 7,75 + ... + 7,96}{10} = 7,859$$

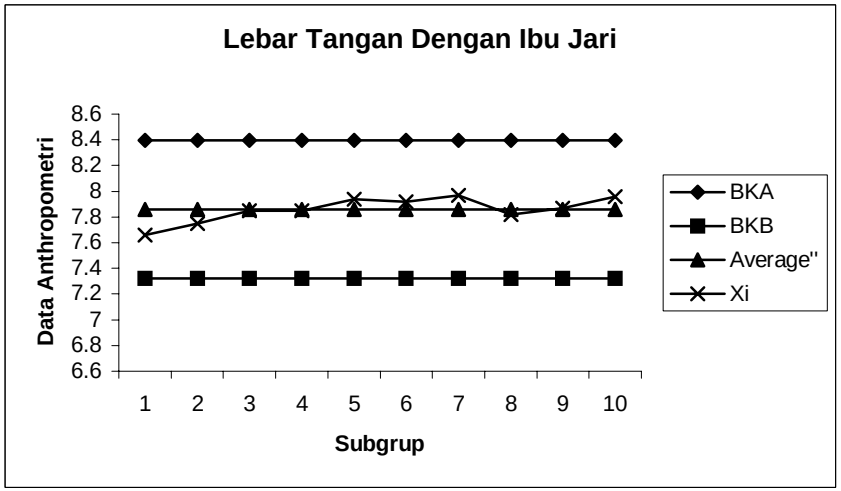
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(6 - 7,859)^2 + (7,5 - 7,859)^2 + ... + (7,2 - 7,859)^2}{100 - 1}}$$

$$= 0,848$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{0,848}{\sqrt{10}} = 0,268$$

$$BKA = \bar{\bar{x}} + c\sigma_{\bar{x}} = 7{,}859 + (2 * 0{,}268) = 8{,}395$$

$$BKB = \bar{\bar{x}} - c\sigma_{\bar{x}} = 7{,}859 - (2 * 0{,}268) = 7{,}323$$



Gambar Grafik Peta Batas Kelas (Manual) Lebar Tangan Dengan Ibu Jari

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 6373{,}35) - 793{,}9^2}}{793{,}9} \right]^2 = 17{,}917 \approx 17{,}92$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 9,5 – 6 = 3,5

P_5 = (Range * 5 %) + Data Minimum = (3,5* 5 %) + 6 = 6,175

P_{50} = (Range * 50 %) + Data Minimum = (3,5* 50 %) + 6 = 7,75

P_{95} = (Range * 5 %) + Data Minimum = (3,5* 95 %) + 6 = 9,325

Lebar Tangan (LT)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	7	5	5	6,4	6	4,5	4,5	6,8	6,4	6,5	5,81

2	7	6,4	6	6,4	6	5	6,3	6	5	6	6,01
3	6	6	6	6	6,5	5,5	6,4	5	7	5,5	5,99
4	5	5,5	5,5	6	4,5	6	6,2	7,5	7	6,3	5,95
5	6,5	5	5,6	7	6,8	6	5	5,5	5	6,4	5,88
6	6	4,8	6,5	7	6,3	5,8	6,5	4,5	5	6,5	5,89
7	4,5	6	7,5	5,5	6,4	5	7,5	6	5,5	6	5,99
8	4,8	5,5	5	6,5	7	6,5	5,5	6,2	5,8	7	5,98
9	6	5,5	6	6,5	6,3	5,5	5,8	6,5	5,5	6	5,96
10	5,7	6	5,8	7	7,2	6	5,5	6,3	4,5	5,7	5,97
										Total	59,43
										Rata-rata	5,943

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{5{,}81 + 6{,}01 + ... + 5{,}97}{10} = 5{,}943$$

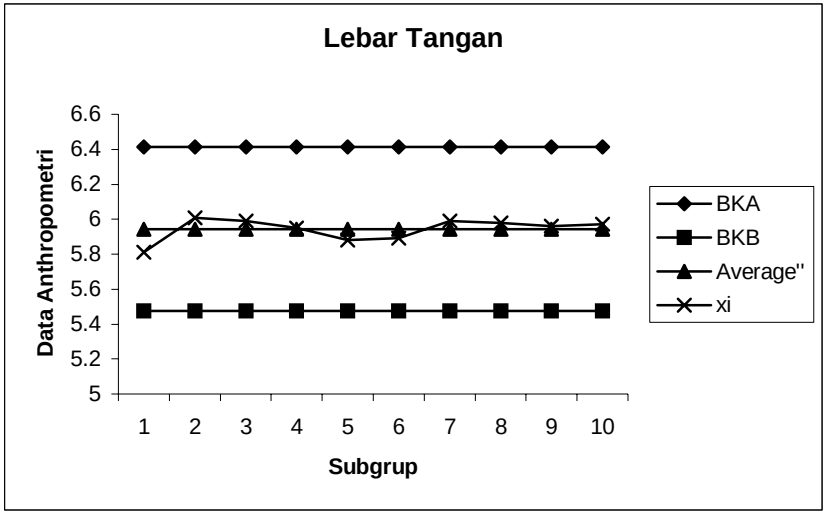
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(7 - 5{,}943)^2 + (5 - 5{,}943)^2 + ... + (5{,}7 - 5{,}943)^2}{100 - 1}}$$

$$= 0{,}741$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{0{,}741}{\sqrt{10}} = 0{,}23432 \approx 0{,}234$$

$$BKA = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 5{,}943 + (2 * 0{,}2343) = 6{,}412$$

$$BKB = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 5{,}943 - (2 * 0{,}2343) = 5{,}474$$



Gambar Grafik Peta Batas Kelas (Manual) Lebar Tangan

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 3586{,}35) - 594{,}3^2}}{594{,}3} \right]^2 = 24{,}6552 \approx 24{,}66$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 7,5 – 4,5 = 3

P_5 = (Range * 5 %) + Data Minimum = (3* 5 %) + 4,5 = 4,65

P_{50} = (Range * 50 %) + Data Minimum = (3* 50 %) + 4,5 = 6

P_{95} = (Range * 5 %) + Data Minimum = (3* 95 %) + 4,5 = 7,35

Jarak Siku Ke Jari Kelingking (JSK)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	25	23	25	25,5	26	28	27	23,5	24	25	25,2
2	23	24	25,5	30	24	24	23	27	22	28,6	25,11
3	23	25	24,3	24,5	23	25	28	30,5	28,4	23	25,47
4	24	24,5	20,5	27	27,5	26,5	27	22	26	26	25,1
5	26	22	26,5	24,2	26	26	26	23	27	28,5	25,52
6	26	25,5	24,5	28,5	22	24	25	27	26	27	25,55
7	24	26	24,2	27	26,5	25	24	26	24	28	25,47
8	20	28	24,5	26	28,5	25,5	24,5	28	23	24,5	25,25
9	23	24,5	27	25,5	28,5	26,5	21,5	24,5	22,5	27,5	25,1
10	20,5	23	25,5	26	26	27	28	26,5	25,5	26,5	25,45
										Total	253,22
										Rata-rata	25,322

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{25{,}2 + 25{,}11 + ... + 25{,}45}{10} = 25{,}322$$

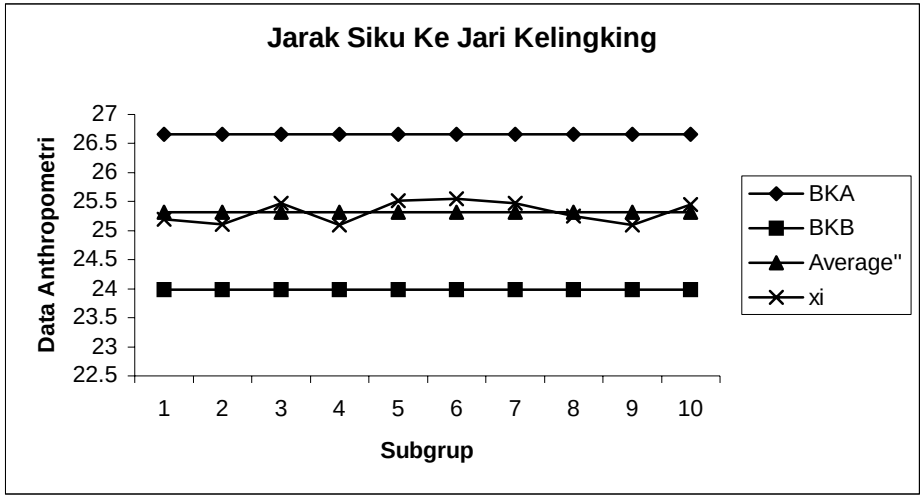
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(25 - 25{,}322)^2 + (23 - 25{,}322)^2 + ... + (26{,}5 - 25{,}322)^2}{100 - 1}}$$

$$= 2{,}107$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{2{,}107}{\sqrt{10}} = 0{,}6664 \approx 0{,}666$$

$$BKA = \bar{\bar{x}} + c\sigma_{\bar{x}} = 25{,}322 + (2 * 0{,}666) = 26{,}655$$

$$BKB = \bar{\bar{x}} - c\sigma_{\bar{x}} = 25{,}322 - (2 * 0{,}666) = 23{,}99$$



Gambar Grafik Peta Batas Kelas (Manual) Jarak Siku Ke Kelingking

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 63749{,}54) - 2516{,}2^2}}{2516{,}2} \right]^2 = 11{,}04148 \approx 11{,}04$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 30,5 – 20 = 10,5

P_5 = (Range * 5 %) + Data Minimum = (10,5* 5 %) + 20 = 20,525

P_{50} = (Range * 50 %) + Data Minimum = (10,5* 50 %) + 20 = 25,25

P_{95} = (Range * 5 %) + Data Minimum = (10,5* 95 %) + 20 = 29,975

Jarak Siku Ke Jari Manis (JSM)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	27	25	24,5	26	28,3	24	28	24	26,5	26,5	25,98
2	24,5	25,5	27	21,5	26,5	25,5	24	28,3	24	28,4	25,52
3	30,8	28	24	24	24	27	24	24,2	25,5	24	25,55
4	25,5	26,5	22,5	29	28	27,5	30	23	28	27	26,7
5	28	29	28	25,5	28	26,5	29	24,5	29	25,5	27,3
6	27,5	27	25	30	32	26	27	28,5	28,5	28,5	28
7	25	24,5	29	29	27,6	26,5	26	28	25	29	26,96
8	31,2	30,5	25,5	27	31,5	27,5	26,5	28,6	25,5	26,5	28,03
9	25,5	26,5	28,5	26	25,5	28	26	25	24	30	26,5
10	21,5	25	28	27	27,5	29	29,5	28	28,5	29	27,3
										Total	267,84

Rata-rata	26,784

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{25{,}98 + 25{,}52 + ... + 27{,}3}{10} = 26{,}784$$

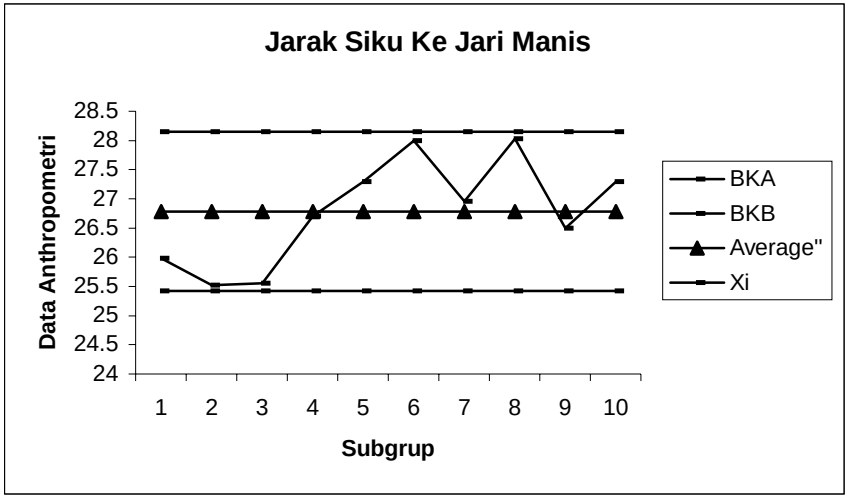
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(27 - 26{,}784)^2 + (25 - 26{,}784)^2 + ... + (29 - 26{,}784)^2}{100 - 1}}$$

$$= 2{,}153$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{2{,}153}{\sqrt{10}} = 0{,}680919 \approx 0{,}681$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{x}} = 26{,}784 + (2 * 0{,}681) = 28{,}146$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{x}} = 26{,}784 - (2 * 0{,}681) = 25{,}42$$



Gambar Grafik Peta Batas Kelas (Manual) Jarak Siku Ke Jari Manis

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 72197{,}28) - 2678{,}4^2}}{2678{,}4} \right]^2 = 10{,}2375 \approx 10{,}238$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 32 – 21,5 = 10,5

P_5 = (Range * 5 %) + Data Minimum = (10,5* 5 %) + 21,5 = 22,025

P_{50} = (Range * 50 %) + Data Minimum = (10,5* 50 %) + 21,5 = 26,75

P_{95} = (Range * 5 %) + Data Minimum = (10,5* 95 %) + 21,5 = 31,475

Lebar Jari Tengah (LJT)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	1,2	0,8	1,5	1,26	0,85	0,8	1,25	1,5	0,9	1,35	1,141
2	1	1,1	0,98	1,3	1,35	1,3	0,9	1,1	1,3	1,05	1,138
3	1,1	1,2	1,3	0,8	0,7	1,5	1,4	1,1	1,4	0,8	1,13
4	0,8	1,1	1,28	1,1	1,1	1	1,15	1,8	0,9	1	1,123
5	1,16	0,9	1,2	1,35	0,8	0,8	1,28	1,4	0,9	1,5	1,129
6	0,75	1,2	1,15	1,4	1,14	0,9	0,9	1,4	1,2	1,25	1,129
7	1,3	1	1	1,2	1,1	1,2	1,14	1,1	1,12	1,28	1,144
8	1,3	1,45	1,3	1,4	1,35	1	1,15	0,9	1	0,98	1,183
9	1,3	1,15	1,15	1,25	1,2	0,9	1	1,28	1	1,2	1,143
10	1,28	1,3	1,14	1,15	1,14	1,5	0,75	1,12	0,7	1,35	1,143
										Total	11,403
										Rata-rata	1,1403

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{1{,}141 + 1{,}138 + \ldots + 1{,}143}{10} = 1{,}1403$$

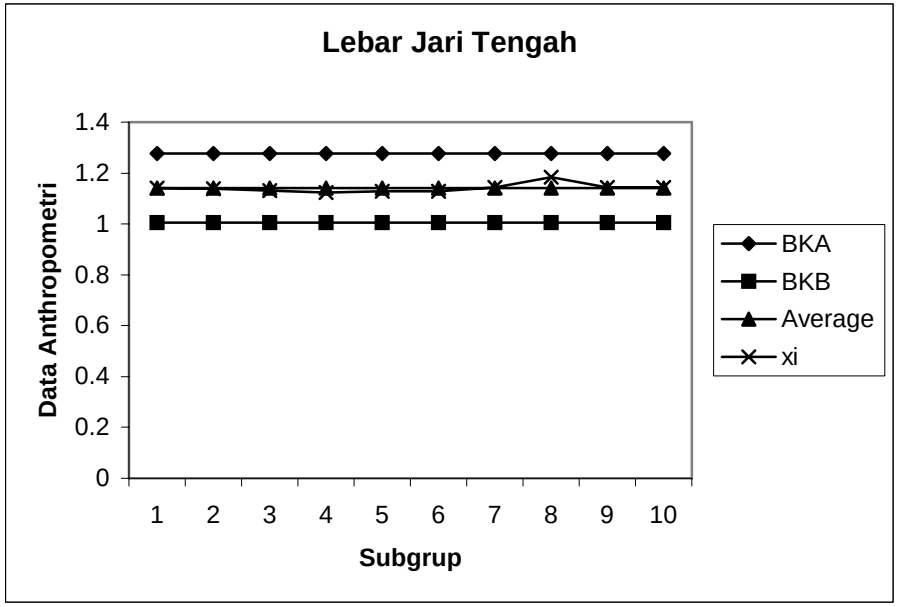
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(1{,}2 - 1{,}1403)^2 + (0{,}8 - 1{,}1403)^2 + \ldots + (1{,}35 - 1{,}1403)^2}{100 - 1}}$$

$$= 0{,}2149$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{0{,}2149}{\sqrt{10}} = 0{,}0679$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{x}} = 1{,}1403 + (2 * 0{,}0679) = 1{,}276$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{x}} = 1{,}1403 - (2 * 0{,}0679) = 1{,}004$$



Gambar Grafik Peta Batas Kelas (Manual) Lebar Jari Tengah

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 134{,}6007) - 114{,}03^2}}{114{,}03} \right]^2 = 56{,}262 \approx 56{,}26$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 1,8 – 0,7 = 1,1

P_5 = (Range * 5 %) + Data Minimum = (1,1* 5 %) + 0,7 = 0,755

P_{50} = (Range * 50 %) + Data Minimum = (1,1* 50 %) + 0,7 = 1,25

P_{95} = (Range * 5 %) + Data Minimum = (1,1* 95 %) + 0,7 = 1,745

Lebar Jari Telunjuk (LTJ)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	0,7	1	0,8	0,9	1,3	1,14	1	1,15	1,05	1,12	1,016
2	1,35	1,25	1,05	0,85	1,05	0,75	1,15	0,95	1,25	0,85	1,05
3	1,1	0,9	1,05	0,7	1,02	1,12	0,8	1,3	1,02	1,2	1,021
4	1,4	0,75	1,05	0,95	1,05	0,85	0,95	1,25	0,95	1,15	1,035
5	1,03	1,12	0,75	1,25	1,13	0,9	1,15	1,03	1,12	0,7	1,018
6	1,12	0,85	1,15	1,05	0,85	1,3	1	0,8	1,15	0,95	1,022
7	1,2	0,7	0,95	1,12	0,8	1,15	1,1	0,85	1,26	1,02	1,015
8	0,95	1,2	0,75	1,25	1	1,05	0,9	1,05	0,85	1,15	1,015
9	1,02	0,8	1,1	0,95	1,12	0,7	1,12	1,3	0,85	1,2	1,016
10	1,12	1,25	1	1,15	0,8	1,05	0,85	0,75	1,2	1	1,017
										Total	10,225
										Rata-rata	1,0225

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{1{,}016 + 1{,}05 + \ldots + 1{,}017}{10} = 1{,}0225$$

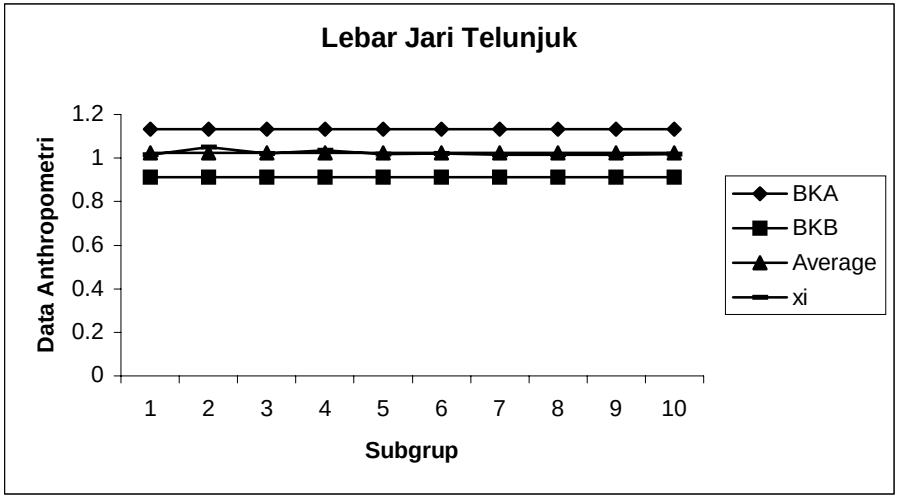
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(0{,}7 - 1{,}0225)^2 + (1 - 1{,}0225)^2 + \ldots + (1 - 1{,}0225)^2}{100 - 1}}$$

$$= 0{,}1719$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{0{,}1719}{\sqrt{10}} = 0{,}05436 \approx 0{,}054$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 1{,}0225 + (2 * 0{,}054) = 1{,}131$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 1{,}0225 - (2 * 0{,}054) = 0{,}9137$$



Gambar Grafik Peta Batas Kelas (Manual) Lebar Jari Telunjuk

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 107{,}4771) - 102{,}25^2}}{102{,}25} \right]^2 = 44{,}7855 \approx 44{,}786$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 1,4– 0,65 = 0,75

P_5 = (Range * 5 %) + Data Minimum = (0,75* 5 %) + 0,65= 0,6875

P_{50} = (Range * 50 %) + Data Minimum = (0,75* 50 %) + 0,65 = 1,025

P_{95} = (Range * 5 %) + Data Minimum = (0,75* 95 %) + 0,65 = 1,3625

PanjangTangan (PT)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	8,5	11	12,5	10	12,5	13	11,5	9,5	13,6	12,5	11,46
2	10,5	9	12,5	11,5	13,6	9,5	12	13	11,5	12	11,51
3	11	13	8,5	12,5	11	13,8	10,5	13	12,5	9,5	11,53
4	12	10	11	9	13	11	13,6	13,6	11	12	11,62
5	11	13	11	12	14,5	9	12	10	13,6	12	11,81
6	8,5	13	13,6	10,5	12,5	11	13	11	10	12,5	11,56
7	11,5	12	9	11	12,5	10	13	11	13,8	15	11,88
8	11,5	10	12	13,5	8,5	12,5	13,7	9,5	12,5	11	11,47
9	11	13,7	9,5	12	10	13	11	10	13	12	11,52
10	10	13	12	11	14,5	12	9	14	12	11	11,85
										Total	116,21
										Rata-rata	11,621

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{11{,}46 + 11{,}51 + \ldots + 11{,}85}{10} = 11{,}621$$

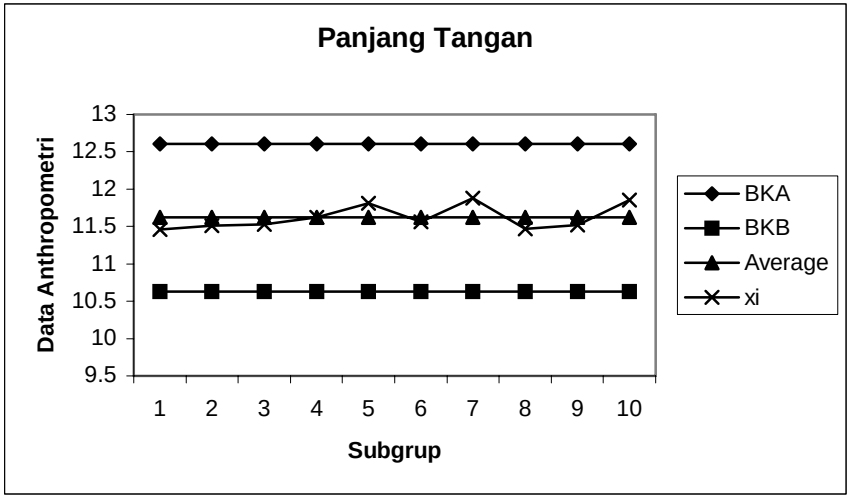
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(8{,}5 - 11{,}621)^2 + (11 - 11{,}621)^2 + \ldots + (11 - 11{,}621)^2}{100 - 1}}$$

$$= 1{,}563$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{1{,}563}{\sqrt{10}} = 0{,}494$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 11{,}621 + (2 * 0{,}494) = 12{,}6098$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 11{,}621 - (2 * 0{,}494) = 10{,}632$$



Gambar Grafik Peta Batas Kelas (Manual) Panjang Tangan

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 13746{,}77) - 1162{,}1^2}}{1162{,}1} \right]^2 = 28{,}672$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 15– 8 = 7

P_5 = (Range * 5 %) + Data Minimum = (7* 5 %) + 8= 8,35

P_{50} = (Range * 50 %) + Data Minimum = (7* 50 %) + 8 = 11,5

P_{95} = (Range * 5 %) + Data Minimum = (7* 95 %) + 8 = 14,65

Lebar Jari Manis (LJM)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	1	0,8	1,5	0,9	0,8	1,1	1	1,2	0,85	1	1,015
2	1,2	1	0,9	0,98	0,9	0,85	1,2	1	0,95	0,95	0,993
3	1	1	1,05	1,1	1,3	1,25	1	0,8	0,6	0,8	0,99
4	1,1	1	1	1,02	1,05	1,1	1,15	0,7	0,8	0,9	0,982
5	1,25	0,8	1,25	1	1,15	0,85	0,9	0,9	0,8	0,8	0,97
6	0,85	1,2	0,9	1,05	1,05	0,9	0,85	1	1	1	0,98
7	1	0,9	1	0,7	0,9	1,1	1	1,1	1	1,1	0,98
8	0,75	1,3	0,7	1,2	0,73	1,3	1,1	1,05	1,1	0,7	0,993
9	1,1	0,8	1	1,2	1,2	1	0,7	1	1	1,1	1,01
10	1	0,9	1,1	1,05	1,05	0,7	1	1,15	1	0,95	0,99
										Total	9,903
										Rata-rata	0,9903

Contoh Perhitungan :

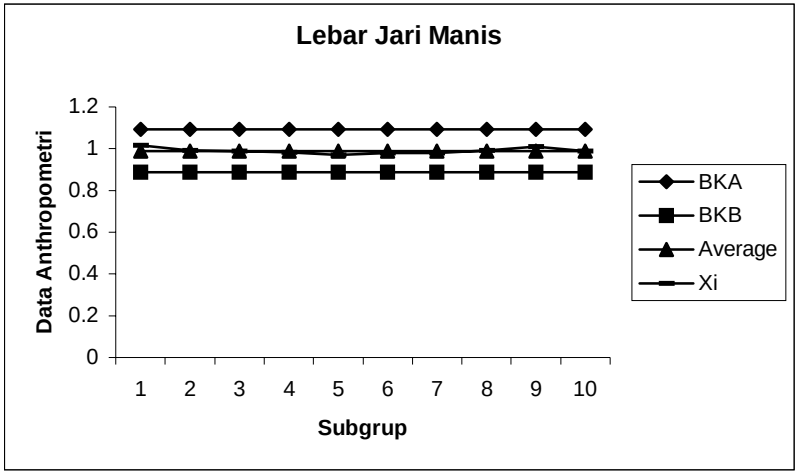
$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{1{,}015 + 0{,}993 + \ldots + 0{,}99}{10} = 0{,}9903$$

$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(1 - 0{,}9903)^2 + (0{,}8 - 0{,}9903)^2 + \ldots + (0{,}95 - 0{,}9903)^2}{100 - 1}} = 0{,}1623$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{0{,}1623}{\sqrt{10}} = 0{,}0513$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 0{,}9903 + (2 * 0{,}0513) = 1{,}093$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 0{,}9903 - (2 * 0{,}0513) = 0{,}888$$



Gambar Grafik Peta Batas Kelas (Manual) Lebar Jari Manis

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 100{,}679) - 99{,}03^2}}{99{,}03} \right]^2 = 42{,}575$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 1,5– 0,6 = 0,9

P_5 = (Range * 5 %) + Data Minimum = (0,9* 5 %) + 0,6 = 0,645

P_{50} = (Range * 50 %) + Data Minimum = (0,9* 50 %) + 0,6 = 1,05

P_{95} = (Range * 5 %) + Data Minimum = (0,9* 95 %) + 0,6 = 1,455

Panjang Ibu Jari (PIJ)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	3	3,6	3,3	4	4,2	3,9	4,4	3,7	4	3,9	3,8
2	4,5	3,2	4	3,4	3,6	4,2	4	3,9	3,9	3,8	3,85
3	3,6	3,9	3,3	4	3,6	4,2	4	3,9	4,5	4	3,9
4	3,7	4	3,2	3,9	3,9	3,4	4,2	3,6	4	4,4	3,83
5	3,3	4	3,9	4,5	4,2	3,6	4	3,8	4	3,7	3,9
6	3,2	3,9	4	3,8	3,9	4,4	3,4	4	4,2	3,6	3,84
7	4	3,3	3,9	4	3,6	4	3,8	4,5	3,7	4,2	3,9
8	3,9	4	4,5	3,3	4	3,6	3,9	3,4	4,2	3,8	3,86
9	4	3,7	3,2	4,4	3,9	4	3,4	4,2	3,9	3,6	3,83
10	4,8	3,6	4,2	4	3,3	3,9	4	3,9	3,7	4,2	3,96
										Total	38,67
										Rata-rata	3,867

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{3{,}8 + 3{,}85 + \ldots + 3{,}96}{10} = 3{,}867$$

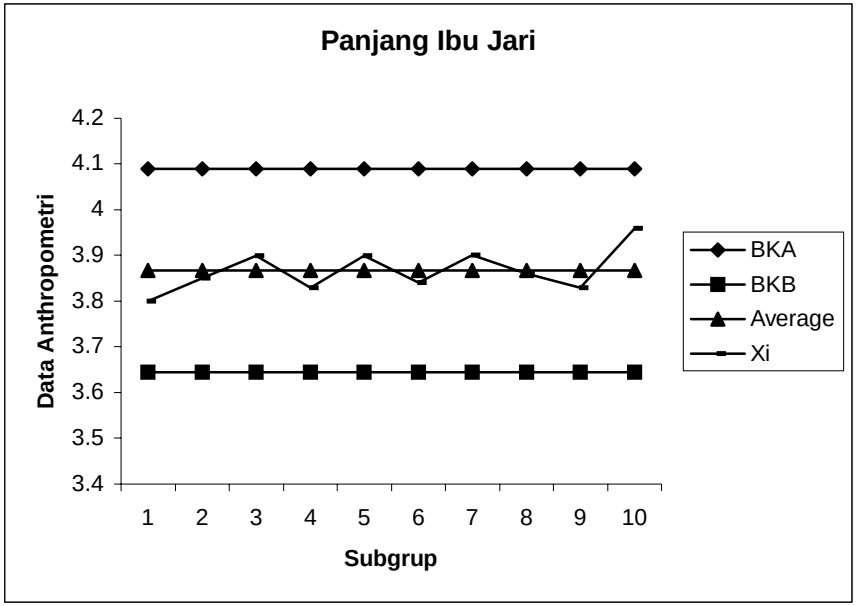
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(3 - 3{,}867)^2 + (3{,}6 - 3{,}867)^2 + \ldots + (4{,}2 - 3{,}867)^2}{100 - 1}}$$

$$= 0{,}3507$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{0{,}3507}{\sqrt{10}} = 0{,}111$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{x}} = 3{,}867 + (2 * 0{,}01109) = 4{,}089$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{x}} = 3{,}867 - (2 * 0{,}01109) = 3{,}645$$



Gambar Grafik Peta Batas Kelas (Manual) Panjang Ibu Jari

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 1507{,}55) - 386{,}7^2}}{386{,}7} \right]^2 = 13{,}03$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 4,8– 3 = 1,8

P_5 = (Range * 5 %) + Data Minimum = (1,8* 5 %) + 3= 3,09

P_{50} = (Range * 50 %) + Data Minimum = (1,8* 50 %) + 3 = 3,9

P_{95} = (Range * 5 %) + Data Minimum = (1,8* 95 %) + 3 = 4,71

Panjang Telapak Tangan (PTT)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	5,6	7,4	6,8	7,1	7,7	6,5	7,4	8,3	7,1	6,2	7,01
2	8,0	6,5	7,1	7,4	5,9	7,1	7,4	7,1	7,7	6,2	7,04
3	7,1	7,7	5,9	7,1	6,8	8,0	7,1	7,4	7,4	7,4	7,19
4	8,3	7,1	6,0	7,4	6,5	7,1	7,4	7,7	6,2	7,1	7,08
5	7,1	8,5	7,4	7,7	6,5	7,1	6,2	6,8	6,2	7,7	7,12
6	6,5	7,1	8,3	6,2	7,4	7,7	7,1	7,4	7,7	6,5	7,19
7	7,1	6,2	8,5	7,4	7,7	6,8	6,2	6,5	7,7	7,4	7,15
8	7,4	5,9	7,1	6,5	6,2	7,7	7,4	7,1	8,0	7,1	7,04
9	6,2	6,8	7,1	7,4	7,7	7,1	7,7	8,8	6,5	6,5	7,18
10	6,5	7,4	7,7	7,1	5,6	7,4	8,0	6,8	7,1	7,4	7,1
										Total	71,1
										Rata-rata	7,11

Contoh Perhitungan :

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{7{,}01 + 7{,}04 + ... + 7{,}1}{10} = 7{,}11$$

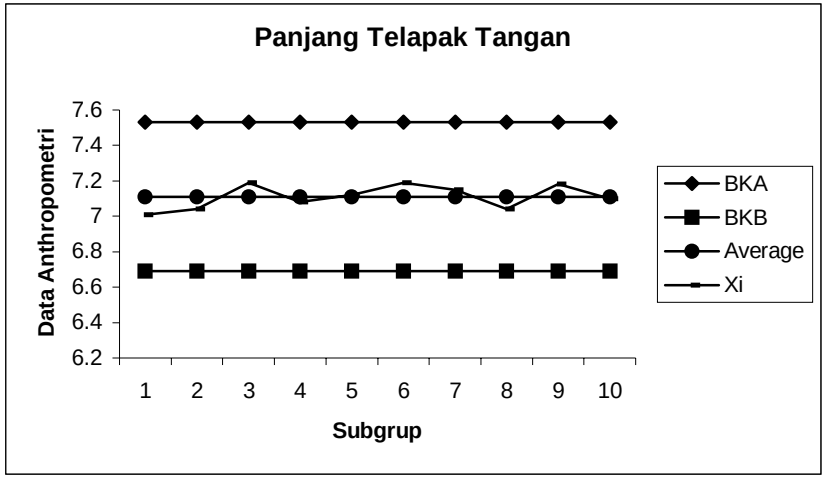
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(5{,}6 - 7{,}11)^2 + (7{,}4 - 7{,}11)^2 + ... + (7{,}4 - 7{,}11)^2}{100 - 1}}$$

$$= 0{,}665$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{0{,}665}{\sqrt{10}} = 0{,}21$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 7{,}11 + (2 * 0{,}21) = 7{,}531$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 7{,}11 - (2 * 0{,}21) = 6{,}689$$



Gambar Grafik Peta Batas Kelas (Manual) Panjang Telapak Tangan

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 5099{,}04) - 711^2}}{711} \right]^2 = 13{,}87$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 8,8– 5,6 = 3,2

P_5 = (Range * 5 %) + Data Minimum = (3,2* 5 %) + 5,6= 5,76

P_{50} = (Range * 50 %) + Data Minimum = (3,2* 50 %) + 5,6 = 7,2

P_{95} = (Range * 5 %) + Data Minimum = (3,2* 95 %) + 5,6 = 8,64

Lebar Ibu Jari (LIJ)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	1,05	2,25	1,35	2,03	1,8	1,73	1,5	1,95	1,47	1,8	1,693
2	2,25	1,13	1,73	1,35	2,1	1,58	1,8	1,65	1,95	1,5	1,704
3	1,35	2,1	1,92	1,74	2,03	1,88	1,2	1,5	1,65	1,68	1,705
4	2,25	1,95	2,1	1,05	1,47	1,35	1,8	1,65	1,73	1,58	1,693
5	2,3	2,25	1,35	1,58	1,65	1,88	1,65	1,2	1,5	1,47	1,683
6	1,35	2,1	1,92	1,68	1,2	1,5	1,73	1,65	1,95	1,8	1,688
7	2,25	1,5	1,28	1,65	2,03	1,35	1,89	1,71	1,71	1,8	1,717
8	2,03	1,92	2,1	1,35	1,95	1,13	1,65	1,8	1,5	1,73	1,716
9	1,92	2,18	1,2	1,5	2,03	1,88	1,35	1,71	1,8	1,65	1,722
10	1,2	1,95	1,71	1,8	1,58	1,73	1,5	2,1	1,35	1,92	1,684
										Total	17,005
										Rata-rata	1,7005

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{1{,}693 + 1{,}704 + \ldots + 1{,}684}{10} = 1{,}7005 \approx 1{,}70$$

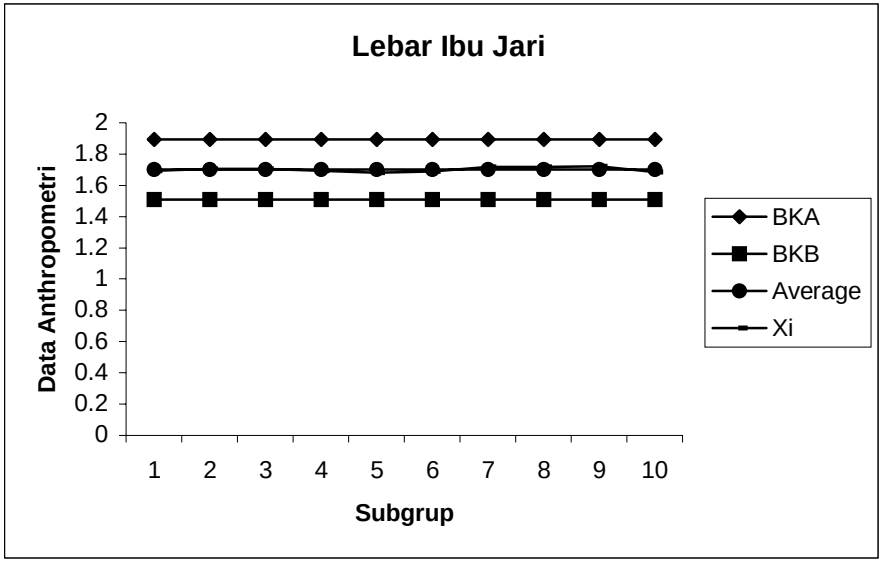
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(1{,}05 - 1{,}70)^2 + (2{,}25 - 1{,}70)^2 + \ldots + (1{,}92 - 1{,}70)^2}{100 - 1}}$$

$$= 0{,}3046 \approx 0{,}305$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{0{,}305}{\sqrt{10}} = 0{,}096$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{x}} = 1{,}7005 + (2 * 0{,}096) = 1{,}893$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{x}} = 1{,}7005 - (2 * 0{,}096) = 1{,}508$$



Gambar Grafik Peta Batas Kelas (Manual) Lebar Ibu Jari

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 298{,}037) - 169{,}96^2}}{169{,}96} \right]^2 = 50{,}81$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 2,3– 1,05 = 1,25

P_5 = (Range * 5 %) + Data Minimum = (1,25* 5 %) + 1,05 = 1,1125 ~ 1,11

P_{50} = (Range * 50 %) + Data Minimum = (1,25* 50 %) + 1,05 = 1,675 ~ 1,68

P_{95} = (Range * 5 %) + Data Minimum = (1,25* 95 %) + 1,05 = 2,2375 ~ 2,24

Panjang Jari Telunjuk (PTJ)

Uji Keseragaman Data :

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	3,81	4,95	4,7	5,33	4,95	5,08	5,59	4,55	4,57	4,32	4,785
2	4,95	3,94	5,72	5,33	4,55	4,57	5,33	4,95	4,55	5,08	4,897
3	5,59	5,33	4,7	4,95	4,06	5,08	4,32	5,08	4,57	4,55	4,823
4	5,33	5,72	5,08	4,32	4,95	4,55	5,08	4,06	4,95	4,57	4,861
5	5,59	4,06	4,95	5,33	4,57	4,7	5,08	4,55	5,08	4,32	4,823
6	5,72	5,33	5,33	4,7	4,32	5,08	4,57	4,95	4,55	4,95	4,95
7	5,08	4,57	5,33	4,06	5,59	5,08	4,95	4,95	4,32	4,55	4,848
8	4,32	5,72	5,33	5,08	4,57	5,33	4,55	4,95	4,95	4,7	4,95
9	4,59	5,33	5,08	4,32	4,95	5,08	4,06	4,55	4,57	4,95	4,748
10	4,32	5,72	5,08	5,33	5,33	4,55	4,95	4,95	4,57	4,7	4,95
										Total	48,635
										Rata-rata	4,8635

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{4{,}785 + 4{,}897 + \ldots + 4{,}95}{10} = 4{,}864 \approx 4,$$

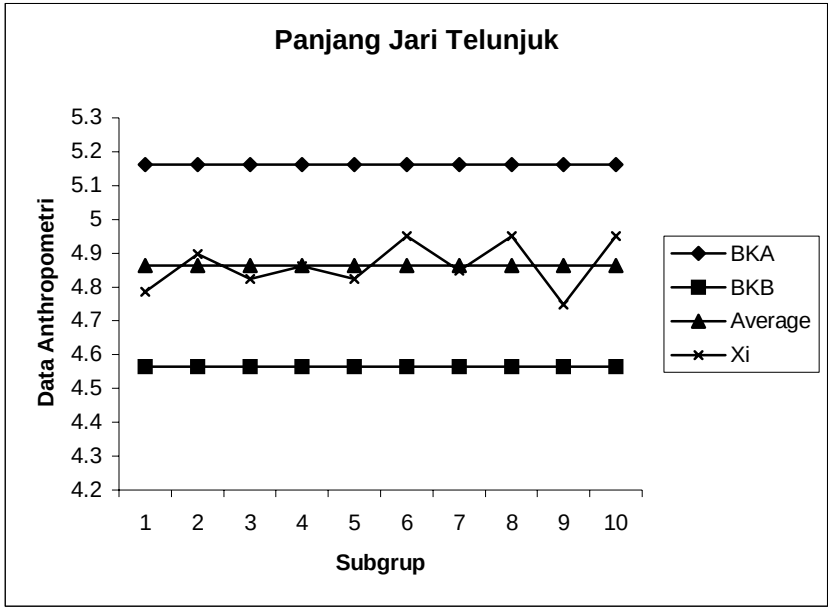
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{(3{,}81 - 4{,}864)^2 + (4{,}95 - 4}{100}$$

$$= 0{,}47345 \approx 0{,}474$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{0{,}47345}{\sqrt{10}} = 0{,}149$$

$$BKA = \bar{\bar{x}} + c\sigma_{\bar{x}} = 4{,}864 + (2 * 0{,}149) = 5{,}163$$

$$BKB = \bar{\bar{x}} - c\sigma_{\bar{x}} = 4{,}864 - (2 * 0{,}149) = 4{,}564$$



Gambar Grafik Peta Batas Kelas (Manual) Panjang Jari Telunjuk

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 2384{,}568) - 486{,}04^2}}{486{,}04} \right]^2 = 15{,}05$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 5,72– 3,81= 1,91

P_5 = (Range * 5 %) + Data Minimum = (1,91* 5 %) + 3,81= 3,9055 ~ 3,906

P_{50} = (Range * 50 %) + Data Minimum = (1,91* 50 %) + 3,81= 4,765

P_{95} = (Range * 5 %) + Data Minimum = (1,91* 95 %) + 3,81= 5,6245 ~ 5,625

Tebal Telapak Tangan

Uji Keseragaman Data

Subgrup	1	2	3	4	5	6	7	8	9	10	**Rata-rata**
1	1,10	1,90	1,60	1,90	2,10	1,80	1,30	1,40	1,70	1,50	1,63

2	2,30	1,20	2,00	1,40	1,80	1,70	1,50	1,90	1,60	1,40	1,68
3	1,50	2,30	2,10	1,20	1,90	1,50	1,60	1,80	1,40	1,75	1,705
4	1,90	1,90	1,10	1,80	1,50	2,10	1,60	1,30	1,70	1,40	1,63
5	2,40	1,50	2,10	1,90	1,30	1,80	1,40	1,80	1,60	1,60	1,74
6	1,30	1,40	2,30	1,20	1,90	1,80	2,00	1,60	1,70	1,50	1,67
7	2,50	1,85	1,90	2,10	1,80	1,30	1,60	1,40	1,65	1,50	1,76
8	2,20	1,20	1,70	1,60	1,40	2,00	1,50	1,80	1,30	1,90	1,66
9	1,90	1,90	2,50	2,10	1,30	1,70	1,40	1,50	1,80	1,60	1,77
10	1,30	2,30	1,60	1,80	1,50	1,90	1,80	2,00	1,50	1,35	1,705
										Total	16,95
										Rata-rata	1,695

$$\bar{\bar{x}} = \frac{\sum xi}{k} = \frac{1{,}63 + 1{,}68 + \ldots + 1{,}705}{10} = 1{,}695 \approx 1{,}70$$

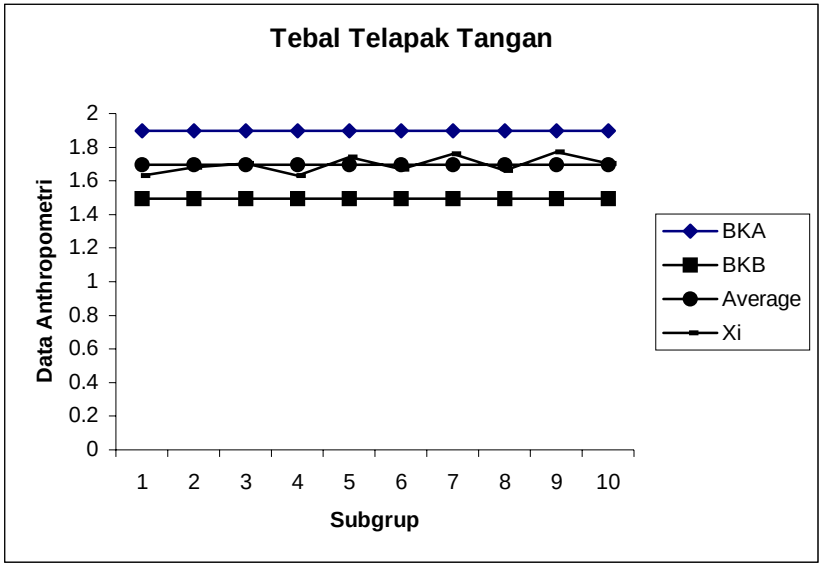
$$\sigma = \sqrt{\frac{\sum_{i=11}^{36} (xi - \bar{\bar{x}})^2}{N - 1}} = \sqrt{\frac{(1{,}1 - 1{,}695)^2 + (1{,}9 - 1{,}695)^2 + \ldots + (1{,}35 - 1{,}695)^2}{100 - 1}}$$

$$= 0{,}3187 \approx 0{,}319$$

$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{0{,}3187}{\sqrt{10}} = 0{,}101$$

$$\text{BKA} = \bar{\bar{x}} + c\sigma_{\bar{\bar{x}}} = 1{,}695 + (2 * 0{,}10079) = 1{,}896$$

$$\text{BKB} = \bar{\bar{x}} - c\sigma_{\bar{\bar{x}}} = 1{,}695 - (2 * 0{,}10079) = 1{,}493$$



Gambar Grafik Peta Batas Kelas (Manual) Tebal Telapak Tangan

Kesimpulan : Nilai rata-rata semua sub grup berada di antara BKA dan BKB. Maka data seragam.

Uji Kecukupan Data

$$N' = \left[\frac{c/\alpha \sqrt{N \sum xi^2 - (\sum xi)^2}}{\sum xi} \right]^2$$

$$= \left[\frac{2/0{,}05 \sqrt{(100 * 297{,}360) - 169{,}5^2}}{169{,}5} \right]^2 = 56{,}011$$

N = 100

N' < N, maka data dikatakan cukup

Perhitungan Persentil :

Range = Data maximum – data minimum

= 2,5– 1,1= 1,4

P_5 = (Range * 5 %) + Data Minimum = (1,4* 5 %) + 1,1 = 1,17

P_{50} = (Range * 50 %) + Data Minimum = (1,4* 50 %) + 1,1 = 1,8

P_{95} = (Range * 5 %) + Data Minimum = (1,4* 95 %) + 1,1 = 2,43

LAMPIRAN 2

DATA ANTHROPOMETRI SISWA

Data Anthropometri												
No	JSK	JST	JSTJ	JSIJ	JSPT	JSM	LT	LTIJ	TMD	TL	TSB	TDT
1	25	26	27	21	15	27	5	6	49	31	69	58
2	23	26	25	22	17	25	4.8	7.5	47	29.5	66	65

3	25	25	24.5	20	14.5	24.5	5	7.3	43.5	30	64.5	60.5
4	25.5	28	26	21	16	26	5.5	8	44.8	31	72	65
5	26	30	29	20	15	28.3	7	9.3	46	33	74	57
6	22	25	24.5	20.5	18	24	7.5	6	45	30	66.5	64
7	27	28.5	27	23.5	17	28	7	6.5	47	33.5	65	54.5
8	23.5	26.5	24.5	22	15	24	7	9	46.8	31	67	59
9	24	27	27.5	20	16.5	26.5	5	8.5	48	32	67.8	62
10	25	27	26.5	21	18	26.5	5	8.5	47	30	71	66
11	23	26	23	22	14.5	24.5	6.4	9	51	33	72	63
12	24	27	25	20.5	14	25.5	6	8	50.6	33	71	59
13	25.5	27	26	21	17	27	4.5	8	47.6	30	66	55
14	20	23	22	23.5	15	21.5	4.5	7.5	44.5	30	63.5	55
15	24	26.5	26	24	18	26.5	6.8	8	48	33	66	59
16	24	26	25.5	21	14	25.5	6.4	6	50	31	65	54
17	23	24.5	24	23	17	24	6.5	9	52	32	73	62
18	27	28.5	28	22.8	15	28.3	7	8	50.5	30	73.5	66
19	22	25	24.5	23	16	24	6.4	6.5	43.5	33	66	56
20	28.6	26	25	22	15	28.4	6	7.5	43	33.5	65	54
21	23	25	26	22	16	30.8	6.4	8	49.5	33	68	58
22	25	25	24.5	21	14	28	6	9	49	31.5	67.5	65
23	24.3	24.5	24	22	15	24	5	6.5	50.5	33	67.5	60.5
24	24.5	25	24	20.5	14	24	6.3	8	55	29.5	68	65
25	23	25	24	22	16	24	6	8	53.5	33.5	66.8	57
26	25	27	26	21	16	27	5	7.5	48.3	34	62	64
27	28	26.5	24	20	14	24	6	8.5	44.5	36.5	67.5	54.5
28	30.5	24.5	24	25	18.5	24.2	6	7	48.5	30	68	59
29	28.4	26	25	22	17	25.5	6	9	41.5	32	64.5	62
30	23	25	24	22	15.8	24	6	7	43.5	29.5	65	50.5
31	24	26	25	21	14	25.5	6	7	51	30	65	63
32	24.5	27	26.5	25	15	26.5	6.5	7	44.5	35	70	59
33	20.5	23.5	23	23	17.5	22.5	5.5	7.5	50	29.5	72.5	55
34	27	29.5	28.5	22	15	29	6.4	7.5	48	31.5	70	62
35	27.5	30	28.5	21	16	28	5	7	49	30	68	59
36	26.5	28.5	27.5	25	17	27.5	7	7.5	48	36	65	59
37	27	29.5	28	22	16	30	5.5	8	49.5	35	70	62.5
38	22	24.5	24	21.5	17.5	23	5	8	45	32.5	65	55
39	26	29	28	23	17	28	5.5	9.5	49	32	70	60
40	26	28	27	23	16	27	5.5	9.5	50	31.5	66	60
41	26	29	28	23	16	28	6	8.5	43.5	32	69	56

Data Anthropometri												
No	JSK	JST	JSTJ	JSIJ	JSPT	JSM	LT	LTIJ	TMD	TL	TSB	TDT
42	22	28	28	23.5	16	29	4.5	6.8	43.5	32	72	62
43	26.5	29	28	20	18	28	6	8	45	31	62	54
44	24.2	26	25.5	24	17	25.5	6.2	7.5	50	30	69.5	59
45	26	28.5	27.5	24	15.5	28	7.5	8	50	29.5	72.5	56
46	26	27	26.5	24.5	17.5	26.5	7	8.6	45	32.5	68.5	57
47	26	29.5	27.5	24.5	15	29	6.3	9.5	48	36	66	59
48	23	25.5	24.5	21	16	24.5	6.5	8	50	33	69	54
49	27	30	29	25	17.5	29	5	7.5	50	32	72	60
50	28.5	26.5	26	23	20	25.5	5.6	7	49	32	72.5	59
51	26	29	28	25	19	27.5	7	7	43	29	69.5	64
52	25.5	27.5	27	25	17.5	27	6.8	6.4	41.5	33	73.5	64
53	24.5	27.5	26.5	24	16.5	25	6	8	51	32.5	70	57
54	28.5	31	29.5	24.5	17.5	30	5	9	45.5	32	68	57.5
55	22	33	32	25	17	32	5.5	8.3	47	32	64.5	58
56	24	27	26	23.5	19	26	5	8.5	49	33	68	50
57	25	28	26.5	24.5	17.5	27	6.4	8	50.3	33	67	59
58	27	29	28	21.5	15	28.5	6	8.5	48	34	65.6	62
59	26	30	28	25.5	17.5	28.5	4.8	8.5	45.6	30	66	55
60	27	29.5	29	23	17	28.5	6.5	7	47.8	33.5	68	58.5
61	24	26	24.5	25	18	25	7	7.5	50.5	29.5	69.5	60
62	26	26	25	24	17.5	24.5	6.3	7	50	33	69.5	65.5
63	24.2	30	28.5	24	17	29	5.8	6.3	45.8	31.5	71	57.5
64	27	29.5	28.5	25.5	17	29	6.5	7.5	50	30	73	61
65	26.5	30	29.5	26	19	27.6	4.5	7.5	44.8	33	65	52.5
66	25	27	26	22.5	15.5	26.5	5	8.5	51	35	64	54
67	24	28	27	24	17	26	6.5	9	46	33.5	63.5	60
68	26	29	28	24	16	28	4.5	8.5	48	31	66	58.3
69	24	27.5	26.5	25	17	25	6	9	47.6	31	68	55
70	28	29.5	29	25	17	29	7.5	9.6	46	33	69	53.5
71	20	32	32	22	16	31.2	5.5	8	50.8	31	70	63.5
72	28	31.5	30.5	25	16	30.5	6.4	8.5	46.5	33	71.5	59.5
73	24.5	26.5	25.5	24	17	25.5	5	9	47.5	34	68.5	66
74	26	27.5	26.5	25	18	27	7.5	7	44.8	29.5	69.5	50.5
75	28.5	31	29.5	24.5	18	31.5	6	7.5	50.5	29	66	53
76	25.5	28.5	28	23.5	15	27.5	5.5	8	45.6	34	69	57.5
77	24.5	27	26	24	16	26.5	6	7.6	48	34	70	65
78	28	30.5	30	23.5	16.5	28.6	4.8	7.3	47.6	33	72	59.6
79	23	26	25.5	25.5	16.5	25.5	5.5	7.8	45.4	34	71	52
80	24.5	27	26.5	24	18.5	26.5	5	7.5	49	31	70.5	56.5
81	23	26	25.5	26.5	18	25.5	6.5	8	50.3	35.5	69	64
82	24.5	27	26.5	26	18.5	26.5	7	8	49.5	28.5	72	65.5

Data Anthropometri												
No	JSK	JST	JSTJ	JSIJ	JSPT	JSM	LT	LTIJ	TMD	TL	TSB	TDT
83	27	29.5	28.5	22.5	17	28.5	6.5	8.5	48	33	71.5	59.8
84	25.5	26.5	26	23.5	18.5	26	5.5	7	50.5	31	69	64.5
85	28.5	26.5	26	25	18.5	25.5	6.2	8	48	32.5	68	53
86	26.5	28.5	27.5	25	18	28	5.8	8	43.8	32.5	67.5	66
87	21.5	25	26	22.5	16	26	7	8.5	47	30.5	66	58
88	24.5	26.5	25	25	17.5	25	6	8.5	45.5	33.5	64.8	57.5
89	22.5	25	23	21.5	15	24	5.5	9	48	36	65.5	56
90	27.5	30.5	29	22.5	18	30	6	9	47	31	74	61
91	20.5	22	21.5	22.7	15	21.5	6.5	9	48	31	71	51.5
92	23	27.5	26	22.5	17.5	25	6.3	9.5	56	31	70	52
93	25.5	28.5	27.5	23	15.5	28	5.5	8	46	31	65	63
94	26	28	27	23	17	27	5.8	8.3	49	33	68	52.5
95	26	29	28.5	23	17.5	27.5	6.5	8.5	44	30.5	66	56
96	27	29.5	28	24.5	18.5	29	5.5	8	52	36	68.5	62.5
97	28	30	29	23	19	29.5	6	8	44.9	31.5	63.8	57
98	26.5	29.5	27	21.5	17.5	28	5.7	8	45.8	35	65	53.5
99	25.5	29.5	28.5	23	16	28.5	6	8.3	51	32	66.5	59
100	26.5	27	28.5	25.5	19	29	5.8	7.5	45	29.5	66	63
101	24	25.5	24	20	15	23.5	7	7.5	46	34	64.6	60.5
102	26	26	24.5	24	17.5	25	7.2	7.5	56	30	63.5	64
103	23.5	27	24	24	16	23	6	7	46	31	65	60
104	21.5	24.5	27	24	17.5	26.5	5.5	7.5	47	32.5	68	51.6
105	25	26	24.5	25.5	17	24	6.3	7	46.5	33	69	55
106	26.3	28.5	23	25.5	17	22.5	4.5	7.3	48	33	67	59.5
107	22.4	30.5	27.5	25.5	17	27	5.7	7	50.1	35.5	66.5	65
108	25	25	27	24.5	17	26.4	5.3	7.5	48	33	63.5	60.4
109	26	27.5	24	23.5	16.5	23	5	8	50	32.5	66	57
110	23.5	25	26	25	17	25.5	5.5	9	49	30	69	52.6
111	25	28.5	23	20	14	21.5	6	8	46.8	32.5	70	62
112	26.5	26	28	23.5	16.5	28	7	9	47	30	73	58
113	27	29	25	22	17	23.5	7.5	7.3	48	32.5	71.3	61.5
114	21.5	30	26.5	21.5	15	26	7	6.5	43.8	34.5	73	62
115	23	29.5	22	20	14	21	7.5	6.5	44	31	72.5	59
116	24	23.5	28	23	16	27	7.5	7	46	31	71	59
117	25.5	24	24	20	14.5	22.5	6.5	8	49	33	70.5	62
118	27	25.5	27	23.5	17	26.5	6	7	47.8	31.5	71	59.5
119	23.5	26	28.5	23	15	28	6.5	7	46.8	33	65	55
120	24	24.5	31	24.5	15.5	30.5	5	7.5	46.8	30	69	51.5
121	25.5	28	30	24	18	29	5	7	49	33	66	64

Data Anthropometri								
No	LJT	LTJ	PT	PIJ	PTT	LIJ	PTJ	TT
1	1.2	1.28	13.5	3.7	6.5	2.03	4.57	1.40
2	0.8	1.3	13	3.6	6	1.95	3.94	2.30
3	1.5	0.9	12.5	3.9	6.5	1.35	3.81	2.10
4	1.26	1.1	10.5	4.2	6.5	1.65	3.94	1.90
5	0.85	1.05	13	4.5	6.5	1.95	4.06	2.50
6	0.8	1.14	11	3.9	6.5	1.575	3.81	2.30
7	1.25	1	12	3.9	6.5	1.65	5.08	1.80
8	1.5	1.25	11.5	4.2	6.2	1.8	5.33	1.10
9	0.9	0.85	11	4	6.5	1.95	4.57	1.30
10	1.35	0.7	12	4.2	7.1	1.2	4.95	1.50
11	1	0.7	11.5	3.6	6.5	1.05	4.70	1.10
12	1.1	1.35	11	3.9	7.4	2.25	4.57	1.30
13	0.98	1.1	11	4.0	6.5	2.1	4.95	1.60
14	1.3	1.4	12	4.0	7.7	1.65	4.70	1.80
15	1.35	1.03	11	3.3	7.1	1.8	4.57	1.20
16	1.3	1.12	8.5	3.8	5.6	1.2	4.32	1.40
17	0.9	1.2	11.5	4.0	8.0	1.80	5.08	2.10
18	1.1	0.95	11.5	3.2	7.1	1.35	4.55	1.80
19	1.3	1.02	11	3.4	8.3	2.25	4.06	1.30
20	1.05	1.12	10	3.8	7.1	1.89	5.08	1.40
21	1.1	1	11	3.6	6.5	1.28	5.08	1.80
22	1.2	1.25	9	4.0	7.1	1.20	4.06	2.50
23	1.3	0.9	13	3.2	7.4	1.88	4.55	2.30
24	0.8	0.75	10	3.6	6.2	2.25	5.08	1.80
25	0.7	1.12	13	3.3	6.5	1.35	4.06	1.90
26	1.5	0.85	13	3.3	7.4	2.03	4.32	2.00
27	1.4	0.7	12	3.3	6.5	1.50	4.55	2.10
28	1.1	1.2	10	3.2	7.7	1.65	4.57	1.30
29	1.4	0.8	13.7	3.0	7.1	1.47	4.55	1.50
30	0.8	1.25	13	4.0	8.5	1.58	4.06	1.20
31	0.8	0.8	12.5	3.8	7.1	2.03	4.55	1.70
32	1.1	1.05	12.5	3.9	6.2	1.58	3.94	1.50
33	1.28	1.05	8.5	3.3	5.9	1.35	3.81	1.50
34	1.1	1.05	11	4.0	6.8	1.65	3.94	1.30
35	1.1	0.75	11	3.2	7.4	1.58	4.06	1.80
36	1	1.15	13.6	3.6	6.8	1.58	3.81	1.40
37	1.15	0.95	9	3.6	7.1	1.65	5.08	1.80
38	1.8	0.75	12	3.8	5.9	1.80	4.55	2.30
39	0.9	1.1	9.5	3.6	6.0	1.95	4.95	2.10
40	1	1	12	3.6	7.4	1.47	4.06	1.90
41	1.16	0.9	10	3.4	8.3	1.05	4.57	1.90

Data Anthropometri								
No	LJT	LTJ	PT	PIJ	PTT	LIJ	PTJ	TT
42	0.9	0.85	11.5	3.6	8.5	2.25	4.06	1.50
43	1.2	0.7	12.5	3.9	7.1	2.10	4.55	1.40
44	1.35	0.95	9	4.0	7.1	1.65	4.57	1.60
45	0.8	1.25	12	4.4	7.7	2.10	4.57	1.50
46	0.8	1.05	10.5	4.0	7.1	1.20	4.57	1.50
47	1.28	1.12	11	4.0	7.4	1.20	4.55	1.35
48	1.4	1.25	13.5	3.4	7.1	1.65	4.32	1.40
49	0.9	0.95	12	4.2	7.4	1.92	4.57	2.30
50	1.5	1.15	11	3.8	7.7	1.65	4.95	2.10
51	0.75	1.3	12.5	3.9	6.2	1.65	4.57	1.90
52	1.2	1.05	13.6	3.7	7.4	1.50	5.59	1.90
53	1.15	1.02	11	3.6	6.5	1.73	5.33	1.40
54	1.4	1.05	13	3.9	7.4	2.30	5.08	1.20
55	1.14	1.13	14.5	3.7	7.1	1.35	4.32	1.60
56	0.9	0.85	12.5	3.6	7.7	1.50	5.33	1.70
57	0.9	0.8	12.5	3.9	5.9	1.74	4.55	1.30
58	1.4	1	8.5	3.9	6.8	1.35	4.95	1.20
59	1.2	1.12	10	4.2	6.5	1.80	4.70	1.70
60	1.25	0.8	14.5	4.0	6.5	2.03	4.57	1.30
61	1.3	1.14	13	3.9	7.4	1.20	4.95	1.50
62	1	0.75	9.5	3.6	7.7	1.20	4.70	1.80
63	1	1.12	13.8	3.7	6.2	1.92	4.57	1.90
64	1.2	0.85	11	3.6	7.7	2.10	4.95	1.60
65	1.1	0.9	9	3.9	5.6	1.35	4.95	2.10
66	1.2	1.3	11	4.0	6.5	2.25	5.33	2.40
67	1.14	1.15	10	4.5	7.1	1.13	4.55	2.20
68	1.1	1.05	12.5	3.9	8.0	1.80	4.95	1.40
69	1.12	0.7	13	3.9	7.1	1.73	4.57	1.60
70	1.28	1.05	12	4.2	7.1	2.10	4.70	1.80
71	1.3	1	11.5	4.0	7.7	1.71	4.55	1.90
72	1.45	1.15	12	4.2	6.8	1.35	4.95	1.70
73	1.3	0.8	10.5	4.0	7.7	1.35	5.33	1.60
74	1.4	0.95	13.6	3.9	7.1	2.10	5.72	1.80
75	1.35	1.15	12	4.0	7.4	1.80	4.95	1.90
76	1	1	13	4.0	7.4	1.88	4.95	1.80
77	1.15	1.1	13	4.0	7.4	1.95	5.33	1.60
78	0.9	0.9	13.7	4.0	7.1	1.50	5.08	1.50
79	1	1.12	11	4.2	7.4	1.50	5.33	1.65
80	0.98	0.85	9	4.2	6.2	1.80	4.55	1.80
81	1.3	1.15	9.5	3.7	7.1	1.65	4.95	1.90
82	1.15	0.95	13	4.5	6.2	1.80	5.08	2.50

Data Anthropometri								
No	LJT	LTJ	PT	PIJ	PTT	LIJ	PTJ	TT
83	1.15	1.3	13	4.8	7.4	1.71	5.08	1.90
84	1.25	1.25	13.6	4.5	7.7	1.65	5.33	2.30
85	1.2	1.03	10	3.9	8.0	1.68	5.08	2.10
86	0.9	0.8	11	4.5	8.3	1.92	5.33	1.90
87	1	0.85	11	3.9	7.1	1.95	5.33	2.00
88	1.28	1.05	9.5	4.5	7.4	2.18	4.70	1.40
89	1	1.3	10	4.2	7.7	1.95	5.72	1.30
90	1.2	0.75	14	4.0	6.8	2.10	5.59	2.00
91	1.28	1.05	13.6	3.9	7.4	2.03	5.72	1.50
92	1.3	1.25	11.5	4.0	6.5	1.50	4.95	1.50
93	1.14	1.02	12.5	3.9	7.1	1.73	5.72	1.40
94	1.15	0.95	11	4.0	8.8	1.35	4.95	1.70
95	1.14	1.12	13.6	4.2	6.8	1.50	5.72	1.80
96	1.5	1.15	10	4.2	7.1	1.47	5.33	1.60
97	0.75	1.26	13.8	3.7	7.7	1.95	5.08	1.60
98	1.12	0.85	12.5	3.9	7.4	1.73	4.95	1.90
99	0.7	0.85	13	3.7	6.2	1.73	5.08	1.60
100	1.35	1.2	12	3.9	6.2	1.88	4.95	1.50
101	1.2	1.12	12.5	3.4	7.7	1.80	5.08	1.40
102	1.3	0.85	12	4.0	7.7	1.35	5.33	1.60
103	0.8	1.2	9.5	3.4	8.0	1.50	5.33	1.70
104	0.7	1.15	12	3.3	6.5	1.92	4.70	1.90
105	1.5	0.7	12	4.2	7.1	1.50	4.95	1.85
106	1.4	0.95	12.5	4.4	6.2	1.80	4.70	1.75
107	1.1	1.02	15	4.4	6.2	1.92	4.95	2.00
108	1.4	1.15	11	4.4	7.4	1.95	4.32	1.8
109	0.8	1.2	12	4.2	7.1	1.71	5.08	1.3
110	0.8	1	11	4.0	7.7	1.73	4.32	1.4
111	1.1	1.2	8.5	4.0	6.5	1.71	4.06	1.8
112	1.28	1.25	10.5	3.9	7.4	2.25	5.33	2.5
113	1.1	1.3	11	4	7.1	1.13	5.59	2.4
114	1.1	1	12	4	6.5	1.68	5.59	2
115	1	1	11	4.2	7.4	1.05	5.59	1.9
116	1.15	1.2	11.5	4	6.5	2.03	5.33	2
117	1.8	1.1	11	4.2	5.9	1.88	5.08	2.1
118	0.9	1.2	12	4.2	6.5	1.95	5.08	1.3
119	1	1.14	11.5	3.7	5.6	1.5	4.95	1.5
120	1.16	1.1	9.5	4.5	4.7	1.5	5.08	1.6
121	0.9	1.12	10.5	4.8	5.6	1.8	5.06	1.55

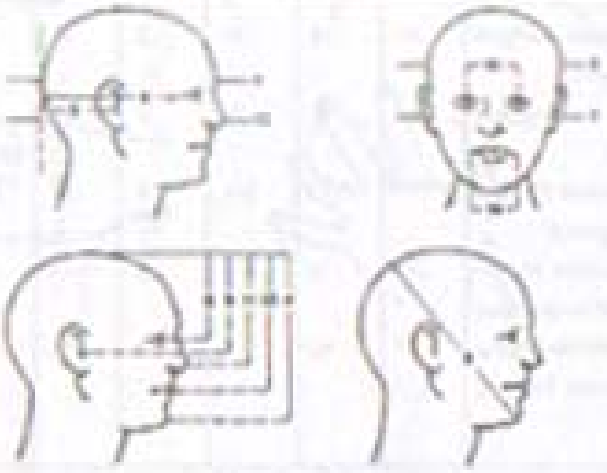
LAMPIRAN 3

TABEL DATA ANTHROPOMETRI

Tabel 5.5 Antropometri kepala orang Indonesia yang didapat dari interpolasi data Pheasant (1986), Sumo'amur (1989), dan Nurmianto (1998).

Dimana : Lebar kepala = 9,2% tinggi badan pria dan 9,3% tinggi badan wanita.
(Semua dimensi dalam satuan mm).

DIMENSI	PRIA				WANITA			
	5th	50th	95th	S.D	5th	50th	95th	S.D
1. Panjang kepala	166	176	186	6	158	168	178	6
2. Lebar Kepala	145	148	148	5	125	129	137	5
3. Diantara Telinga dan Dagu	217	230	243	8	198	209	221	7
4. Diantara Puncak Kepala	192	203	213	7	185	196	208	7
5. Telinga ke Puncak Kepala	70	77	84	4	69	74	79	3
6. Lingkar Kepala	63	67	72	3	59	64	69	3
7. Antara dua Telinga	49	51	54	2	45	48	51	2
8. Mata ke Puncak Kepala	19	22	25	1	18	18	20	1
9. Mata ke Belakang Kepala	15	19	23	1	15	17	19	1
10. Antara dua Pupil Mata	19	21	23	1	15	17	19	1
11. Hidung ke Puncak Kepala	14	18	20	1	13	15	17	1
12. Hidung ke Belakang Kepala	74	81	89	4	68	75	78	5
13. Mulut ke Puncak Kepala	88	98	108	6	87	89	94	5
14. Lebar Mulut	48	50	52	1	44	48	54	5

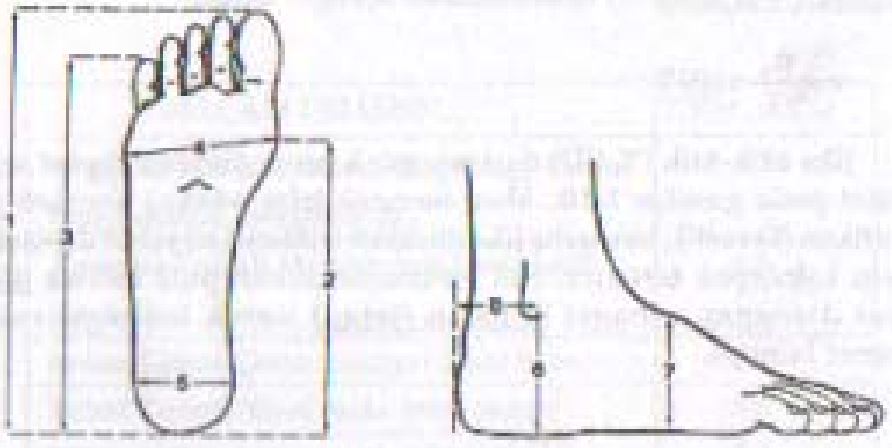


Gambar 5.8.
Antropometri Kepala.

Tabel 5.6 Antropometri Kaki Orang Indonesia yang didapat dari interpolasi data Dempster (1955), Reynolds (1978), dan Nurmianto (1991).

Dimana : Panjang telapak kaki = 15,2% tinggi badan pria dan 14,7% tinggi badan wanita. Dari pendekatan tersebut diusahakan interpolasi antropometri dengan koefisien variansi yang sesuai.

DIMENSI	PRIA				WANITA			
	5th	50th	95th	S.D	5th	50th	95th	S.D
1. Panjang Telapak Kaki	230	248	266	11	212	256	248	11
2. Panjang Telapak Lengan Kaki	168	178	191	9	158	173	186	8
3. Panjang Kaki sampai Jari Kelinglingi	186	201	216	9	178	193	204	8
4. Lebar Kaki	82	89	96	4	81	88	95	4
5. Lebar Tangkai Kaki	61	66	71	3	49	54	59	3
6. Tinggi Mata Kaki	63	66	71	3	59	64	69	3
7. Tinggi Bagian Tengah Kaki	68	75	82	4	64	69	74	3
8. Jarak Horisontal Tangkai Mata Kaki	69	52	55	2	48	49	52	2



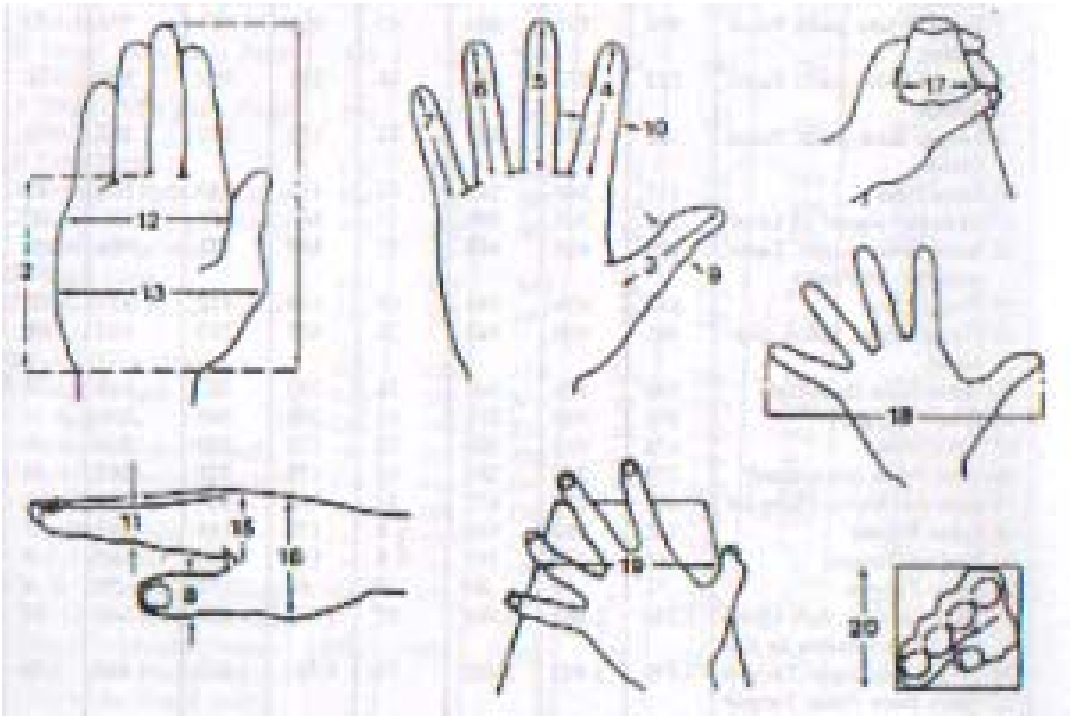
Tabel 5.4 Antropometri telapak tangan orang Indonesia yang didapat dari interpolasi data Pheasant (1986) dan Sunna'mur (1989) dan Nurmianto (1991).
(Semua dimensi dalam satuan mm)

DIMENSI	PRIA				WANITA			
	5th	50th	95th	S.D	5th	50th	95th	S.D
1. Panjang Tangan	163	176	189	8	155	168	181	8
2. Panjang Telapak Tangan	92	100	108	5	87	94	101	4
3. Panjang Ibu Jari	65	68	71	2	62	65	68	2
4. Panjang Jari Telunjuk	62	67	72	3	60	65	70	3
5. Panjang Jari Tengah	70	77	84	4	68	74	79	3
6. Panjang Jari Manis	62	67	72	3	59	64	69	3
7. Panjang Jari Kelingking	48	51	54	2	45	48	51	2
8. Lebar Ibu Jari (IJ)	19	21	23	1	16	18	20	1
9. Tebal Ibu Jari (IJT)	19	21	23	1	15	17	19	1
10. Lebar Jari Telunjuk (PJT)	18	20	22	1	16	17	19	1
11. Tebal Jari Telunjuk (PJT)	16	18	20	1	13	15	17	1
12. Lebar Telapak Tangan (Metacarpal)	74	81	88	4	68	73	78	3
13. Lebar Telapak Tangan (setinggi ibu jari)	88	98	108	6	82	89	96	4
14. Lebar Telapak Tangan (minimum)	68	75	82	4	64	69	74	3
15. Tebal Telapak Tangan (Metacarpal)	28	31	34	2	25	27	29	1
16. Tebal Telapak Tangan (setinggi ibu jari)	41	48	47	2	41	44	47	2
17. Diameter Genggam (maksimum)	45	48	51	2	43	46	49	2
18. Lebar Maksimum (Ibu Jari ke Jari Kelingking)	177	193	209	9	169	184	199	9
19. Lebar Rangkaian Maksimum (Ibu Jari ke Jari lain)	122	133	142	6	113	123	134	6
20. Segi Empat Maksimum yang dapat dilewati Telapak Tangan	57	62	67	3	51	56	61	3

Catatan:
IPJ = Interphalangeal Joint (sambungan antar ruas tulang jari)
PIPJ = Proximal Interphalangeal Joint (sambungan antar ruas tulang jari kearah mendekati tubuh)

LAMPIRAN 4

GAMBAR ANTHROPOMETRI


12
13
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LAMPIRAN 5

ANGKA ACAK

TABEL A.12
Angka Acak *(lanjutan)*

Baris	Kolom							
	1–5	6–10	11–15	16–20	21–25	26–30	31–35	36–40
26	84827	81473	19453	95401	01363	40795	86600	78317
27	97965	30432	92410	42482	31448	78558	55152	27863
28	96097	51256	61546	93683	46277	30115	37682	15694
29	77733	98610	86615	19007	29402	26348	96477	97154
30	73159	81085	96957	48358	90944	58155	73014	79515
31	19074	14518	91372	73333	42832	17500	91049	74510
32	83098	95483	17986	79141	92419	36887	65473	05675
33	10916	60700	37527	26169	07315	08340	31597	05568
34	08693	25225	54798	60498	32060	60310	36587	30579
35	50451	52350	37860	40950	14377	16485	62250	96104
36	73128	88097	01832	19463	28038	00222	83868	74422
37	89677	39520	49118	49660	96852	71822	66195	28204
38	67828	36965	63617	60332	10525	78030	06835	59222
39	30001	63542	05680	12956	96058	80149	79950	39309
40	14283	75479	39727	79075	87995	74464	49102	93185
41	84051	28694	03885	97247	43578	48213	97929	49951
42	80815	60959	58747	50798	47455	18738	58154	95800
43	28515	30696	22612	87285	96888	25681	65597	50837
44	17402	25186	12526	19012	42374	47886	43367	61815
45	66814	38016	61219	14760	99030	38070	81369	94157
46	49751	96432	63666	47760	70192	10367	87197	95801
47	35597	97760	47288	34700	25569	91920	02045	24344
48	03026	00712	49279	10272	30083	61603	26715	89026
49	96637	00092	97446	75109	53899	93915	37789	13073
50	34324	90440	76224	71230	92581	06794	39559	05362

TABEL A.12

Angka Acak

Baris	Kolom							
	1–5	6–10	11–15	16–20	21–25	26–30	31–35	36–40
1	62956	95735	70988	86027	27648	65155	46301	27217
2	17143	50118	41681	87224	75674	43371	09846	83403
3	99285	01369	94610	71099	69207	01999	23931	34711
4	12940	81308	40436	82916	74245	70324	88555	82182
5	28089	80216	08681	83524	00583	55179	31911	68484
6	78079	74747	17626	74930	41800	04858	85634	42398
7	36009	01306	33858	96930	71087	11354	85891	52644
8	95695	52933	39459	84218	34670	91542	02186	86134
9	89221	34158	16364	16532	50070	78159	18445	05884
10	91937	35854	13168	24642	22369	87396	64367	89259
11	07339	63159	94886	51002	85834	94109	56843	03769
12	73238	34352	81008	95682	13029	76288	22054	54849
13	87940	32625	44838	39920	57188	41771	43185	74236
14	46904	92456	64675	66930	54980	11631	54596	50563
15	02580	92653	33907	54380	00763	60452	18860	48829
16	86983	20130	78561	97095	15990	45947	88542	86519
17	92608	22144	67209	88807	82087	06616	16605	95621
18	26988	49617	87118	28108	43110	46286	21216	01567
19	75320	38794	51939	20879	30221	73593	76238	85702
20	18826	84055	91391	78487	07594	74994	64239	00808
21	20198	45182	09914	45305	97352	00516	56804	10931
22	74784	75807	79881	45290	56117	39798	62617	26912
23	08050	25691	87924	75747	55031	82704	97667	03734
24	63096	27923	94686	39205	68047	02108	62144	31291
25	23099	48428	16897	82597	74983	22452	46283	97317

LAMPIRAN 6

KURVA NORMAL

TABEL A.4

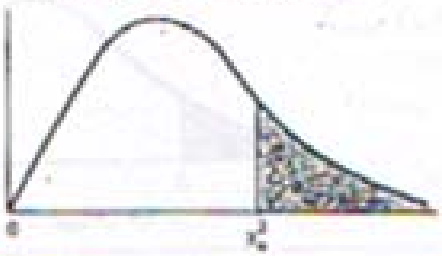
Wilayah Luas Di Bawah Kurva Normal

LAMPIRAN 7

CHI - SQUARE

TABEL A.6*

Nilai Kritik Sebaran Khi-Kuadrat



ν	α							
	0.995	0.99	0.975	0.95	0.05	0.025	0.01	0.005
1	0.0^4393	0.0^3157	0.0^3982	0.0^2393	3.841	5.024	6.635	7.879
2	0.0100	0.0201	0.0506	0.103	5.991	7.378	9.210	10.597
3	0.0717	0.115	0.216	0.352	7.815	9.348	11.345	12.838
4	0.207	0.297	0.484	0.711	9.488	11.143	13.277	14.860
5	0.412	0.554	0.831	1.145	11.070	12.832	15.086	16.750
6	0.676	0.872	1.237	1.635	12.592	14.449	16.812	18.548
7	0.989	1.239	1.690	2.167	14.067	16.013	18.475	20.278
8	1.344	1.646	2.180	2.733	15.507	17.535	20.090	21.955
9	1.733	2.088	2.700	3.325	16.919	19.023	21.666	23.589
10	2.156	2.558	3.247	3.940	18.307	20.483	23.209	25.188
11	2.603	3.053	3.816	4.575	19.675	21.920	24.725	26.757
12	3.074	3.571	4.404	5.226	21.026	23.337	26.217	28.300
13	3.565	4.107	5.009	5.892	22.362	24.736	27.688	29.819
14	4.075	4.660	5.629	6.571	23.685	26.119	29.141	31.319
15	4.601	5.229	6.262	7.261	24.996	27.488	30.578	32.801
16	5.142	5.812	6.908	7.962	26.296	28.845	32.000	34.267
17	5.697	6.408	7.564	8.672	27.587	30.191	33.409	35.718
18	6.265	7.015	8.231	9.390	28.869	31.526	34.805	37.156
19	6.844	7.633	8.907	10.117	30.144	32.852	36.191	38.582
20	7.434	8.260	9.591	10.851	31.410	34.170	37.566	39.997
21	8.034	8.897	10.283	11.591	32.671	35.479	38.932	41.401
22	8.643	9.542	10.982	12.338	33.924	36.781	40.289	42.796
23	9.260	10.196	11.689	13.091	35.172	38.076	41.638	44.181
24	9.886	10.856	12.401	13.848	36.415	39.364	42.980	45.558
25	10.520	11.524	13.120	14.611	37.652	40.646	44.314	46.928
26	11.160	12.198	13.844	15.379	38.885	41.923	45.642	48.290
27	11.808	12.879	14.573	16.151	40.113	43.194	46.963	49.645
28	12.461	13.565	15.308	16.928	41.337	44.461	48.278	50.993
29	13.121	14.256	16.047	17.708	42.557	45.722	49.588	52.336
30	13.787	14.953	16.791	18.493	43.773	46.979	50.892	53.672

*Diringkas dari Tabel 8 *Biometrika Tables for Statisticians*, Vol. 1, dengan izin dari E. S. Pearson dan Biometrika Trustees.

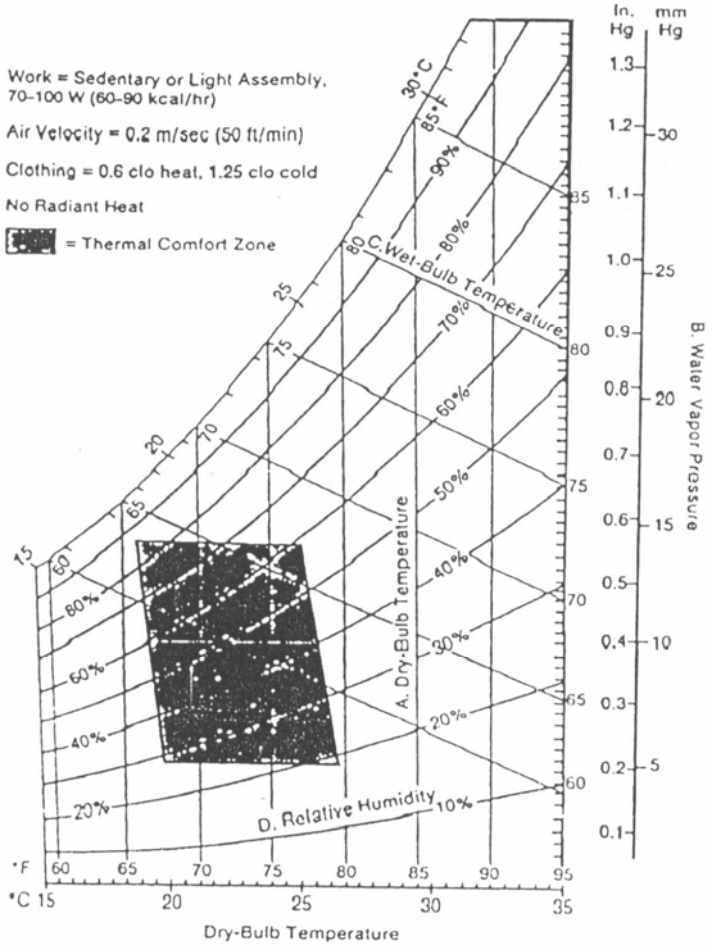
LAMPIRAN 8

RECOMMENDED ILLUMINATION LEVELS

Class of visual task		Recomended illumninance lx	Typical examples takcn from Appendix A
EXCEPTIONALLY DIFFICULT TASKS		2400 or more	Inspection of minute work (e.g. very small instruments) ; Jewellery and watch-making - minute processes ; Hosiery and knitwear - mending dark goods.
NORMAL RANGE OF TASKS AND WORK PLACES	*Very difficult*	1600	Extra-fine bench and machine work, tool and die making (tolerances below 25 µm); Gauging and inspection of small or intericate parts; Hosiery and knitwear - mending light goods; Examining and hand finishing of dark goods; Dye works-final perching.
		1200	Clothing trade - inspection, hand tailoring; Hosiery and knitwear - examining and hand finishing light goods; Grading and matching dark leather; Hat manufacture - inspection; Dye works - colour matching
	Difficult	800	Fine bench and machine work (tolerances down to 25 µm); Inspection of fine work (e.g. calibrates scales, precision mechanisms and instrument); Extra-fine painting, spraying and finishing; Paint colour matching; Dye works - reception grey perching.
	Moderately difficult	600	Office work with poor contrast (see clause 3.6.2); Drawing offices-boards; Fine painting, spraying and finishing; Proof reading; Motor vehicle manufacture-final Inspection; Computer rooms-input and output terminal
		400	Medium bench and machine work (tolerances down to 125 µm); Routine office work-typing, filling, reading, writing; Inspection of medium work (e.g. "Go" and "Not Go" gauges telephone equipment); Motor vehicle manufacture-car and chasis assembly; Woodworking-fine bench and machine work; Structural steel fabrication-marking off; enquiry desks.
	Ordinary	300	Schoolroom chalkboards and charts; Laundries-receiving and dispatch. Pharmaceutical stores; Woodworking-medium bench and machine work; Beverage manufacture-bottling and canning plants; Bookbinding-pasting, punching and stitching; Kitchens-food preparation, cooking, washing up; Staff canteens-counters
	Simple	200	Rough bench and machine work (tolerances above 750 µm); Rough visual inspection, counting, rough cheking of stock parts; Structural steel fabrication-general areas; Entrance halls; Waiting Rooms; Staff canteens-general; Warehouses and bulk stores-packing and dispatch.
		100	Live storage-rough bulky material; Loading bays; Office strongrooms; staf changing room, locker rooms, Dead storage-medium or fine material requiring care

LAMPIRAN 9

DAERAH KENYAMANAN SUHU



The dry bulb temperature and humidity combinations that are comfortable for most people doing sedentary or light work are shown as the shaded area on the psychometric chart. The dry bulb temperature range is from 19° to 26°C (66° to 79°F), and relative humidities (shown as parallel curves) range from 20 to 85 percent, with 35 to 65 percent being the most common values in the comfort zone. On this chart ambient dry bulb temperature (A) is plotted on the horizontal axis and indicated as parallel vertical lines; water vapor pressure (B) is on the vertical axis. Wet bulb temperatures (C) are shown as parallel lines with a negative slope; they intersect the dry bulb temperature lines and relative humidity curves (D) on the chart. In the definition of the thermal comfort zone, assumptions were made about the work load, air velocity, radiant heat, and clothing insulation levels. These assumptions are given in the top left corner of the chart.