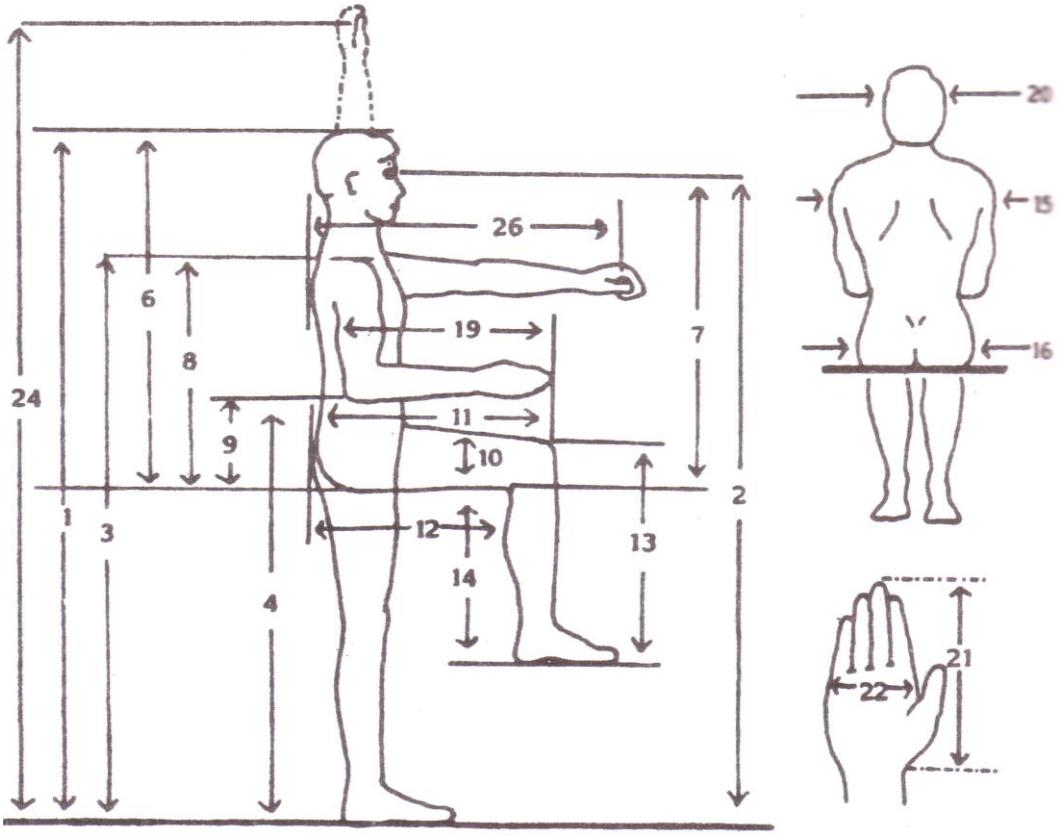
LAMPIRAN 1

DATA ANTHROPOMETRI ORANG INDONESIA MENURUT EKO NURMIANTO

Tabel Data Anthropometri Tubuh Masyarakat Indonesia

DIMENSI TUBUH	PRIA				WANITA			
	5%	X	95%	S.D	5%	X	95%	S.D
1. Tinggi Tubuh Posisi berdiri Tegak	1.532	1.632	1.732	61	1.464	1.563	1.662	60
2. Tinggi Mata	1.425	1.520	1.615	58	1.350	1.446	1.542	58
3. Tinggi Bahu	1.247	1.338	1.429	55	1.184	1.272	1.361	54
4. Tinggi Siku	932	1.003	1.074	43	886	957	1.028	43
5. Tinggi Genggaman Tangan *(Knuckle)* pada Posisi Relaks kebawah	655	718	782	39	646	708	771	38
6. Tinggi Badan pada Posisi Duduk	809	864	919	33	775	834	893	36
7. Tinggi Mata pada Posisi Duduk	694	749	804	33	666	721	776	33
8. Tinggi Bahu pada Posisi Duduk	523	572	621	30	501	550	599	30
9. Tinggi siku pada Posisi Duduk	181	231	282	31	175	229	283	33
10. Tebal Paha	117	140	163	14	115	140	165	15
11. Jarak dari Pantat ke Lutut	500	545	590	27	488	537	586	30
12. Jarak dari Lipat Lutut *(popliteal)* ke Pantat	405	450	495	27	488	537	586	30
13. Tinggi Lutut	448	496	544	29	428	472	516	27
14. Tinggi Lipat Lutut *(popliteal)*	361	403	445	26	337	382	428	28
15. Lebar Bahu *(bideltoid)*	382	424	466	26	342	385	428	26
16. Lebar Panggul	291	331	371	24	298	345	392	29
17. Tebal Dada	174	212	250	23	178	228	278	30
18. Tebal Perut *(abdominal)*	174	228	282	33	175	231	287	34
19. Jarak dari Siku ke Ujung Jari	405	439	473	21	374	409	287	34
20. Lebar Kepala	140	150	160	6	135	146	157	7
21. Panjang Tangan	161	176	191	9	153	168	183	9
22. Lebar Tangan	71	79	87	5	64	71	78	4
23. Jarak Bentang dari Ujung Jari Tangan Kiri ke Kanan	1.520	1.663	1.806	87	1.400	1.523	1.646	75
24. Tinggi Pegangan Tangan *(grip)* pada Posisi Tangan Vertikal ke Atas & Berdiri Tegak	1.795	1.923	2.051	78	1.713	1.841	1.969	79
25. Tinggi Pegangan Tangan *(grip)* pada Posisi Tangan Vertikal ke Atas & Duduk	1.065	1.169	1.273	63	945	1.030	1.115	52
26. Jarak Genggaman Tangan *(grip)* ke Punggung pada Posisi Tangan ke Depan (horisontal)	649	708	767	37	610	661	712	31

Gambar Anthropometri Tubuh Manusia



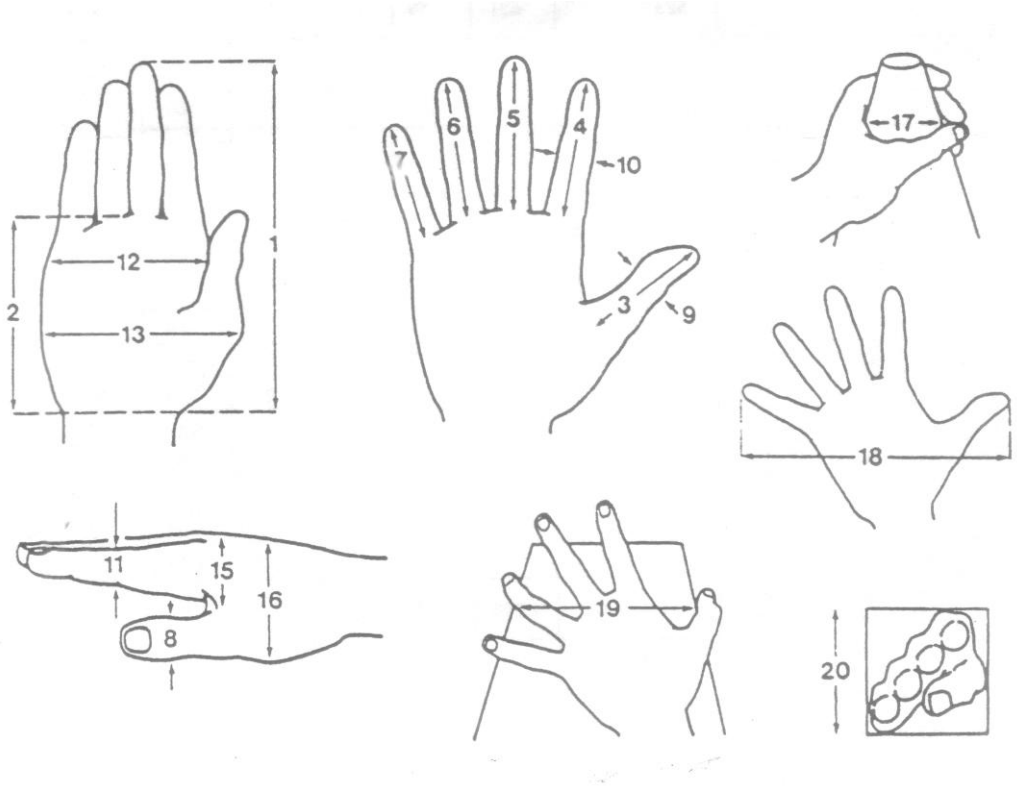
Tabel Data Anthropometri Telapak Tangan Masyarakat Indonesia

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	45	48	51	2	42	45	48	2
4. Panjang Jari Telunjuk	62	67	72	3	60	65	70	3
5. Panjang Jari Tengah	70	77	84	4	69	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 (IPJ)	19	21	23	1	16	18	20	1
9. Tebal Ibu Jari (IPJ)	19	21	23	1	15	17	19	1
10. Lebar Jari Telunjuk (PIPJ)	18	20	22	1	15	17	19	1
11. Tebal Jari Telunjuk (PIPJ)	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 (sampai Ibu Jari)	88	98	108	6	82	89	96	4
14. Lebar Telapak Tangan (Minimum)	68	75	82	4	64	59	74	3
15. Tebal Telapak Tangan (*Metacarpal*)	28	31	34	2	25	27	29	1
16. Tebal Telapak Tangan (sampai 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	192	206	9	169	184	199	9
19. Lebar Fungsional Maksimum (Ibu Jari ke Jari lain)	122	132	142	6	113	123	134	6
20. Segi Empat Minimum 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 ke arah mendekati tubuh).

Gambar Anthropometri Telapak Tangan Manusia



LAMPIRAN 2

GAMBAR ANTHROPOMETRI

DIMENSI TUBUH MANUSIA

LAMPIRAN 3

HANDBOOK OF ERGONOMICS

Table WRKSTN-D5: Recommended Illumination Levels for Interior Lighting[2]

Activity type	Illumination level (lx)
Rough orientation	75
Occasional rough visual tasks	150
Rough assembly	320
Rough toolmaking	550
Office work—simple	750
Bookkeeping—small character size	1,500
Difficult inspection	1,500
Technical drawing	2,200
Precise assembly work	5,000
Prolonged difficult visual task	7,500
Precise and delicate visual work	11,000
Very special visual tasks—extremely low contrast and small object size	15,000

Table WRKSTN-D7: Reflectance Factors for Surface Color[3]

Color	Reflectance	Color	Reflectance
White	85		
Light:		Dark:	
Cream	75	Gray	30
Gray	75	Red	13
Yellow	75	Brown	10
Buff	70	Blue	8
Green	65	Green	7
Blue	55		
Medium:		Wood Finish:	
Yellow	65	Maple	42
Buff	63	Satinwood	34
Gray	55	English Oak	17
Green	52	Walnut	16
Blue	35	Mahogany	12

LAMPIRAN 4

DATA MENTAH ANTHROPOMETRI MAHASISWA TI-UKM

No	Tinggi duduk tegak	Tinggi bahu duduk	Tinggi siku duduk	Tebal paha	Tinggi popliteal	Pantat popliteal	Panjang sandaran	Lebar sandaran	Lebar pinggul	Lebar bahu	Panjang Lengan Bawah	Tinggi Badan Tegak	Pangkal ke Tangan	Lebar Jari	Pjg Jari Tengah	Tebal Dada
1	85.0	58.0	25.2	13.0	42.0	45.0	42.0	23.0	37.2	43.0	24.0	160.0	9.0	8.0	7.5	23.0
2	88.0	59.8	32.5	10.0	48.8	42.5	44.5	19.0	39.6	42.0	28.0	162.5	8.0	7.5	9.0	18.6
3	92.0	57.2	26.0	8.6	43.0	48.0	54.0	24.5	34.2	39.0	26.0	156.3	9.6	6.0	8.0	21.0
4	84.2	62.0	22.0	15.0	46.5	45.2	46.0	18.0	34.3	41.0	26.0	165.2	9.0	5.5	7.0	22.0
5	86.5	53.0	26.2	17.5	46.5	46.8	50.0	20.0	38.5	45.0	26.0	162.5	8.0	6.0	10.0	19.5
6	88.0	65.0	26.5	17.0	45.0	50.0	57.0	17.0	35.0	49.9	22.0	167.0	8.8	7.0	10.0	20.0
7	86.0	57.7	22.8	14.2	45.9	43.0	51.2	14.0	46.0	43.5	24.0	173.0	7.4	8.5	8.0	22.0
8	91.0	56.5	22.0	14.5	40.5	48.6	46.0	22.0	35.4	42.5	25.0	163.0	8.5	7.5	9.0	18.8
9	86.8	59.0	27.5	9.3	47.8	42.5	47.6	15.0	36.7	44.4	27.0	160.0	9.6	8.0	10.0	19.6
10	84.0	61.2	23.0	11.0	44.6	46.0	45.0	19.0	34.5	40.8	26.5	165.0	9.0	7.0	9.5	21.1
11	90.0	60.0	22.5	16.5	41.5	51.5	45.5	21.0	38.7	39.5	28.0	168.0	8.0	8.5	10.0	18.3
12	90.0	55.0	24.0	10.0	39.5	47.0	54.0	28.0	33.4	41.5	23.2	164.0	9.0	8.5	9.8	15.8
13	81.0	59.0	24.5	12.1	42.0	47.8	46.0	17.5	38.4	41.5	25.5	156.4	7.5	7.0	11.7	19.0
14	87.0	60.5	21.5	14.0	45.0	51.0	48.0	20.0	34.0	42.7	28.0	166.0	7.2	8.0	11.5	25.0
15	85.0	57.0	25.0	18.0	43.8	49.0	49.0	14.5	37.0	40.4	27.5	167.0	8.0	7.0	10.4	22.0
16	79.5	63.0	21.1	18.5	46.2	51.0	43.0	15.5	42.0	43.0	27.0	164.0	9.0	7.0	9.5	24.0
17	84.0	56.0	20.0	13.5	45.7	46.3	47.1	21.0	36.0	46.0	27.0	159.0	10.5	7.0	9.5	18.6
18	81.0	61.5	24.4	12.4	43.5	50.3	52.5	16.7	38.8	48.0	27.3	164.0	12.0	6.5	8.5	21.2
19	88.0	58.8	25.0	12.5	44.5	45.0	53.0	19.0	32.0	45.0	27.5	169.0	8.0	7.0	9.0	17.5
20	87.0	59.7	27.5	19.0	38.6	49.7	52.5	15.0	34.5	43.0	27.5	159.0	10.0	6.0	10.4	16.4
21	90.0	59.0	24.5	17.0	45.0	46.0	56.0	14.0	35.6	45.0	25.0	169.0	9.0	7.5	10.4	26.0
22	93.0	63.5	23.0	15.0	43.5	43.0	60.0	22.0	36.9	46.0	28.0	167.0	7.0	7.5	8.0	21.0
23	85.0	65.0	22.5	14.0	48.0	49.0	59.0	17.0	34.0	48.0	24.0	166.0	8.5	7.5	8.5	15.0
24	90.0	58.0	24.5	17.0	46.4	43.5	54.0	23.0	41.3	46.5	28.0	171.0	8.0	6.0	10.0	18.0
25	90.0	55.5	19.0	14.0	43.0	50.0	48.0	19.0	35.5	45.5	29.0	156.5	9.0	7.5	7.5	21.0
26	87.0	54.0	23.0	12.5	39.0	47.0	57.0	21.5	38.5	46.0	25.0	176.5	7.0	6.5	8.5	23.0
27	81.0	62.0	30.8	15.5	40.0	47.5	56.0	22.0	36.0	40.5	26.0	173.0	7.0	7.0	8.5	28.0
28	90.0	56.0	22.5	14.2	48.5	46.6	53.6	26.0	41.2	45.4	21.0	164.5	7.0	6.5	10.0	19.0
29	85.0	54.5	20.5	13.1	39.7	45.5	59.0	17.0	44.0	46.0	22.0	165.0	11.0	8.0	8.0	14.1
30	92.0	55.1	21.8	16.6	43.0	43.8	46.0	19.5	36.4	51.5	28.0	177.2	9.0	7.0	10.0	21.1
31	86.1	58.2	25.4	14.5	41.6	45.5	56.0	20.0	39.6	46.2	24.0	177.3	7.3	7.0	8.4	23.0
32	81.3	60.1	23.1	15.4	45.5	46.8	58.7	26.0	40.0	41.3	29.5	165.6	8.5	10.0	11.0	25.0
33	84.0	56.1	25.3	15.5	45.0	43.5	59.0	18.0	36.9	42.8	27.0	170.3	8.0	6.0	10.5	18.0
34	76.0	61.0	19.1	17.2	43.7	45.5	52.0	24.0	39.5	39.1	23.0	168.6	10.0	7.0	12.0	20.0
35	84.0	63.5	23.0	16.2	41.5	49.2	44.0	16.5	37.0	40.6	26.0	161.4	9.0	7.0	10.5	17.0
36	91.0	57.0	22.2	19.0	40.4	43.2	43.0	15.0	32.5	45.5	26.5	163.2	8.0	7.0	9.9	16.0
37	82.6	62.0	25.6	16.6	42.1	48.0	55.0	17.5	36.1	43.9	23.0	161.0	8.0	10.5	9.6	23.0
38	87.8	58.1	24.0	14.7	44.3	46.3	53.0	21.5	35.2	40.5	24.5	155.0	9.6	9.8	8.6	20.4
39	83.2	64.5	21.5	14.3	48.6	49.9	54.0	16.4	36.0	44.0	25.0	158.0	11.0	7.5	10.0	22.2
40	86.2	59.2	23.3	15.6	47.6	47.3	50.5	18.2	34.5	49.6	24.0	159.4	10.0	7.5	8.9	20.2
41	85.2	60.8	26.3	13.2	38.7	44.1	48.6	16.2	35.2	43.3	23.5	162.3	9.0	9.0	10.0	13.0
42	79.6	62.0	20.4	12.2	41.5	45.8	49.0	14.0	40.5	42.3	25.0	166.5	9.1	9.0	9.7	20.0
43	83.2	60.8	21.6	18.0	37.6	47.4	47.0	23.0	39.2	44.4	26.0	175.0	8.0	8.0	9.3	13.0
44	89.5	61.5	24.0	10.5	42.5	43.9	56.0	14.5	33.5	43.3	25.0	170.0	9.0	8.5	8.4	19.0
45	85.5	54.2	22.1	15.9	42.4	48.5	54.0	19.0	34.2	49.5	27.0	168.0	10.0	9.0	8.3	24.5
46	86.0	60.9	28.4	16.3	43.5	51.1	43.0	18.2	35.8	47.0	25.0	169.0	7.0	7.7	10.2	22.0
47	91.5	56.5	19.0	14.4	44.2	48.4	47.7	24.0	37.8	42.0	27.5	158.5	8.0	9.2	8.8	21.5
48	91.1	57.5	24.0	18.8	40.3	51.2	42.2	17.8	35.8	41.0	27.0	168.0	8.5	7.2	8.5	18.3
49	82.0	57.3	22.2	15.0	39.0	47.5	47.1	15.5	36.0	46.4	25.0	171.5	9.0	7.8	10.5	21.3
50	88.5	55.0	26.7	13.6	42.7	44.1	45.5	23.5	37.8	43.0	24.0	173.0	10.5	9.0	10.1	18.0

No	Tinggi duduk tegak	Tinggi bahu duduk	Tinggi siku duduk	Tebal paha	Tinggi popliteal	Pantat popliteal	Panjang sandaran	Lebar sandaran	Lebar pinggul	Lebar bahu	Panjang Lengan Bawah	Tinggi Badan Tegak	Pangkal ke Tangan	Lebar Jari	Pjg Jari Tengah	Tebal Dada
51	90.0	66.3	20.4	11.0	43.5	48.5	56.5	20.5	40.8	40.5	23.7	164.5	10.5	8.0	9.4	15.0
52	84.2	61.2	22.8	16.1	41.6	42.3	46.0	21.5	39.0	42.5	26.5	169.5	8.0	7.5	10.2	17.0
53	89.2	55.5	19.4	14.5	42.2	47.1	44.0	22.0	35.7	41.8	25.2	159.0	10.5	7.5	9.0	22.0
54	83.0	57.3	22.0	17.6	41.3	42.6	45.0	21.2	34.0	48.4	22.6	168.0	10.0	10.0	9.0	18.0
55	79.0	56.0	23.0	13.5	42.5	50.5	49.0	19.0	40.9	46.5	34.0	165.0	8.0	8.0	9.5	22.0
56	84.4	54.0	30.0	12.0	41.8	46.6	51.0	16.0	33.8	45.0	26.0	170.0	8.0	7.5	9.0	20.2
57	82.1	55.1	21.5	10.3	42.0	44.9	47.8	19.0	32.5	43.0	27.0	168.0	7.0	7.5	9.0	22.3
58	83.5	59.0	25.3	14.8	39.5	47.8	52.0	23.0	35.7	42.0	27.5	177.0	8.0	6.0	13.0	21.5
59	82.0	54.4	27.7	21.8	43.0	52.3	53.0	24.0	44.5	41.7	26.0	160.0	9.5	6.5	11.0	32.0
60	84.0	53.3	20.8	9.6	39.2	43.8	47.0	17.2	37.3	43.0	24.0	173.0	10.5	7.0	9.0	22.0
61	85.0	61.5	27.0	15.0	43.2	49.0	54.0	22.0	40.5	42.5	25.0	161.0	6.0	9.0	9.5	17.2
62	87.0	59.0	24.0	18.5	44.0	51.0	56.0	23.0	33.0	48.2	23.0	175.0	8.0	7.2	9.1	23.4
63	89.5	63.0	27.0	18.3	47.0	50.5	46.5	20.5	37.5	50.0	27.0	173.0	7.4	8.6	9.4	18.0
64	82.2	56.0	26.0	18.2	42.5	46.4	49.6	19.0	38.7	42.2	23.7	174.0	8.5	6.0	11.0	19.0
65	88.9	58.4	24.2	13.2	42.3	46.3	49.9	22.0	34.6	45.6	29.5	164.0	8.5	7.0	9.5	17.0
66	87.8	57.1	22.0	9.2	43.1	43.1	52.7	15.5	36.6	44.4	27.5	168.2	8.0	8.5	9.0	19.5
67	81.0	58.9	26.4	12.7	39.4	48.4	58.7	22.0	37.2	44.8	25.0	173.0	8.0	9.0	8.5	18.6
68	84.6	59.1	25.0	15.8	42.2	44.9	54.0	17.5	33.3	48.8	24.2	172.0	7.0	7.5	9.0	23.5
69	85.3	58.3	23.6	14.1	41.1	47.0	48.4	15.4	32.0	46.5	25.4	160.0	9.0	7.0	9.5	15.0
70	86.0	61.1	25.2	16.4	44.7	46.5	50.5	18.3	39.8	42.0	26.5	176.5	10.0	7.0	8.5	14.0
71	77.8	57.3	21.9	11.7	39.4	48.0	43.0	21.0	37.0	44.3	22.5	176.5	10.5	7.0	9.0	19.0
72	83.0	60.0	25.0	20.0	42.5	46.3	51.6	19.0	40.4	41.5	24.4	165.0	9.5	8.0	10.5	21.8
73	88.5	58.0	28.8	18.5	39.5	49.5	47.0	16.5	31.0	44.4	26.0	173.0	10.5	6.2	12.0	17.1
74	85.0	56.0	24.0	16.0	38.3	46.0	43.5	25.0	38.0	48.5	24.0	171.4	8.0	8.5	9.1	22.0
75	90.0	61.2	23.0	13.4	40.5	47.0	48.0	27.5	33.5	46.7	23.0	168.8	8.0	8.0	10.0	17.5
76	79.5	60.2	19.8	20.5	43.2	49.0	49.0	24.5	44.8	42.9	25.0	175.0	14.0	10.0	8.0	19.0
77	83.1	56.3	20.0	14.7	42.0	44.5	42.0	22.7	34.0	40.5	24.0	162.0	8.0	9.0	7.5	20.0
78	90.3	63.0	26.5	15.8	43.4	46.0	53.0	17.5	36.5	46.0	26.0	167.0	9.0	7.5	8.5	24.0
79	81.0	65.0	24.5	14.7	44.1	48.0	50.2	23.5	41.7	51.0	27.0	166.0	5.0	7.0	10.2	22.5
80	92.0	62.0	24.0	14.5	42.0	50.3	56.2	19.5	34.7	43.2	28.5	171.0	8.0	6.5	10.3	22.0
81	85.5	57.0	28.0	16.5	46.0	49.0	51.0	23.4	40.0	45.2	28.0	168.5	6.5	6.0	11.1	23.0
82	87.0	53.5	27.5	19.5	38.8	48.4	45.0	18.0	36.7	42.0	27.0	163.0	10.0	8.0	9.0	23.0
83	90.0	64.0	24.0	17.0	42.3	46.5	52.9	24.0	33.4	45.0	26.5	167.5	9.0	8.0	10.0	24.0
84	88.0	55.4	26.0	16.2	43.6	47.0	50.0	19.0	43.9	48.7	27.5	169.5	7.0	7.0	10.0	28.0
85	80.0	60.0	24.2	11.8	43.7	49.0	50.3	23.0	37.0	46.0	23.5	163.0	8.5	6.5	9.9	27.0
86	86.0	62.0	26.0	11.2	41.0	48.3	46.0	27.0	35.3	46.0	24.5	158.0	7.0	7.5	8.2	17.0
87	90.0	59.6	27.5	13.5	43.2	41.6	50.0	20.2	44.0	45.2	26.5	173.0	8.0	8.0	9.9	19.0
88	82.0	56.4	22.5	17.0	41.5	46.3	41.5	18.6	35.0	48.5	29.0	162.0	15.0	7.0	11.3	26.0
89	84.5	63.0	23.0	13.3	44.0	41.3	45.5	23.6	43.4	47.0	27.0	164.0	10.0	8.0	10.5	23.0
90	94.0	57.0	24.7	14.3	40.4	51.0	46.0	18.0	37.0	47.1	26.9	162.0	7.5	10.0	9.0	20.5
91	83.4	56.0	26.0	18.0	43.7	44.9	45.0	15.0	37.5	40.7	25.0	171.7	7.5	8.5	11.0	23.0
92	81.5	56.0	22.0	15.1	43.0	46.3	43.0	17.2	42.3	41.5	22.0	164.8	9.5	9.5	10.5	22.0
93	80.0	54.5	27.0	15.7	38.0	44.8	49.0	21.3	36.0	44.7	26.5	165.0	7.3	9.5	10.5	19.0
94	86.0	61.8	24.0	14.5	42.3	45.0	41.0	17.0	40.0	42.0	25.0	175.5	10.0	11.0	10.5	21.0
95	89.5	60.2	22.5	10.5	39.0	43.0	44.0	14.0	34.0	40.0	21.3	159.3	11.0	7.0	10.8	19.9
96	87.5	58.0	21.6	12.0	41.9	48.8	50.0	21.4	35.8	47.0	21.5	158.0	9.0	7.5	11.0	27.1
97	85.4	62.0	22.5	16.4	42.1	47.8	52.5	14.5	34.6	44.5	28.5	161.0	6.5	8.0	11.2	22.8
98	88.2	58.0	26.5	9.5	44.0	41.2	53.6	17.0	36.0	43.2	27.5	159.0	8.0	7.0	10.0	22.7
99	87.0	63.0	23.0	15.1	41.2	48.4	46.5	20.5	37.3	40.2	24.5	163.5	6.5	6.5	11.2	18.0
100	83.0	60.2	30.5	18.0	43.2	48.7	40.0	16.0	39.4	48.3	26.0	171.9	8.0	7.1	10.0	23.0

LAMPIRAN 5

UJI NORMAL, SERAGAM, DAN KECUKUPAN DATA

Pengujian Kenormalan, Keseragaman, dan Kecukupan Data

1. Tinggi Duduk Tegak

- Uji Normal
  - k = 3.3 log n + 1

    = 3.3 log 100 + 1 = 7.6 ≈ 8 kelas
  - c = (Xmax – Xmin) / k

    = (94 – 76) / 7.6 = 2.37 ≈ 2.4

Batas Kelas	oi	Z1	Z2	P(Z1)	P (Z2)	P(Z2) - P(Z1)	ei	ei gab	oi gab	χ^2
< 75.95	0	- ∞	-2.634	0	0.004	0.004	0.422			
75.95 – 78.35	2	-2.634	-1.991	0.004	0.023	0.019	1.901	8.874	8	0.086
78.35 – 80.75	6	-1.991	-1.349	0.023	0.089	0.066	6.551			
80.75 – 83.15	17	-1.349	-0.706	0.089	0.240	0.151	15.135	15.135	17	0.230
83.15 – 85.55	25	-0.706	-0.063	0.240	0.475	0.235	23.461	23.461	25	0.101
85.55 – 87.95	18	-0.063	0.579	0.475	0.719	0.244	24.403	24.403	18	1.680
87.95 – 90.35	23	0.579	1.222	0.719	0.889	0.170	17.034	17.034	23	2.090
90.35 – 92.75	7	1.222	1.864	0.889	0.969	0.080	7.978			
92.75 – 95.15	2	1.864	2.507	0.969	0.994	0.025	2.506	11.092	9	0.395
> 95.15	0	2.507	∞	0.994	1	0.006	0.609			
	100					1	100	100	100	4.581

Tabel uji normal

v = k – r – 1

v = 6 – 2 – 1 = 3

α = 0.05

$\chi^2_{(v,\alpha)}$ = 7.815

χ^2 hasil perhitungan = 4.581

χ^2 hasil perhitungan < $\chi^2_{(v,\alpha)}$ → sehingga mengikuti distribusi normal

- Uji Seragam

Subgroup	1	2	3	4	5	6	7	8	9	10	Rata-rata
1	85.0	90.0	90.0	86.1	85.2	90.0	85.0	77.8	85.5	83.4	85.8
2	88.0	90.0	93.0	81.3	79.6	84.2	87.0	83.0	87.0	81.5	85.46
3	92.0	81.0	85.0	84.0	83.2	89.2	89.5	88.5	90.0	80.0	86.24
4	84.2	87.0	90.0	76.0	89.5	83.0	82.2	85.0	88.0	86.0	85.09
5	86.5	85.0	90.0	84.0	85.5	79.0	88.9	90.0	80.0	89.5	85.84
6	88.0	79.5	87.0	91.0	86.0	84.4	87.8	79.5	86.0	87.5	85.67
7	86.0	84.0	81.0	82.6	91.5	82.1	81.0	83.1	90.0	85.4	84.67
8	91.0	81.0	90.0	87.8	91.1	83.5	84.6	90.3	82.0	88.2	86.95
9	86.8	88.0	85.0	83.2	82.0	82.0	85.3	81.0	84.5	87.0	84.48
10	84.0	87.0	92.0	86.2	88.5	84.0	86.0	92.0	94.0	83.0	87.67
									Rata-rata		85.79

$\bar{\bar{x}} = 85.79$

$\sigma = 3.74$

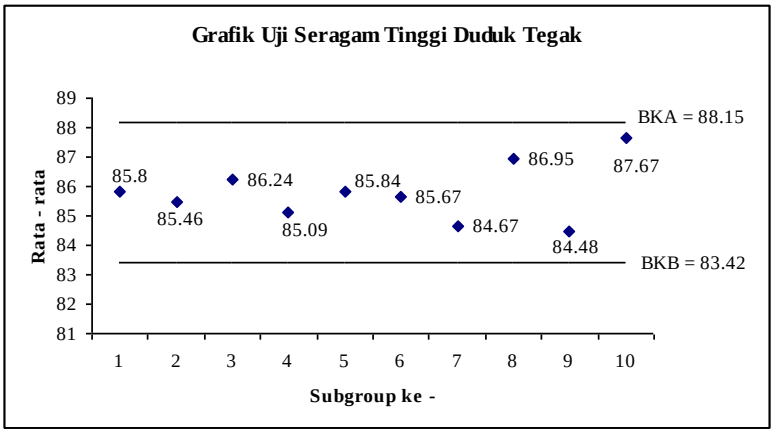
$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{3.74}{\sqrt{10}} = 1.18$$

$$BKB = \bar{\bar{x}} - c(\sigma_x)$$

$= 85.79 - 2(1.18) = 83.42$

$$BKA = \bar{\bar{x}} + c(\sigma_x)$$

$= 85.79 + 2(1.18) = 88.15$



Berdasarkan grafik di atas, dapat disimpulkan bahwa data seragam karena berada dalam batas BKA dan BKB.

- Uji Cukup

  $\sum Xi^2 = 85^2 + 88^2 + ... + 83^2 = 737322.15$

  $(\sum Xi)^2 = (85+ 88 + ... + 83)^2 = (8578.70)^2 = 73594093.69$

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

$$= \left[\frac{2/0.1\sqrt{100(737322.15) - 73594093.69}}{8578.70} \right]^2 = 0.75$$

N = 100

N' < N → data yang diperoleh sudah cukup

2. Tinggi Bahu Duduk

- Uji Normal
  - k = 3.3 log n + 1

    = 3.3 log 100 + 1 = 7.6 ≈ 8 kelas
  - c = (Xmax – Xmin) / k

    = (66.3 – 53) / 7.6 = 1.75 ≈ 1.8

Batas Kelas	oi	Z1	Z2	P(Z1)	P (Z2)	P(Z2) - P(Z1)	ei	ei gab	oi gab	χ^2
< 52.95	0	- ∞	-1.925	0	0.027	0.027	2.710	8.971	9	0.000
54.75 – 54.75	9	-1.925	-1.343	0.027	0.090	0.063	6.260			
54.75 – 56.55	19	-1.343	-0.760	0.090	0.224	0.134	13.393	13.393	19	2.347
56.55 – 58.35	19	-0.760	-0.177	0.224	0.430	0.206	20.597	20.597	19	0.124
58.35 – 60.15	17	-0.177	0.405	0.430	0.657	0.228	22.774	22.774	17	1.464
60.15 – 61.95	16	0.405	0.988	0.657	0.838	0.181	18.104	18.104	16	0.244
61.95 – 63.75	14	0.988	1.570	0.838	0.942	0.103	10.346	10.346	14	1.290
63.75 – 65.55	5	1.570	2.153	0.942	0.984	0.042	4.250	5.816	6	0.006
65.55 – 67.35	1	2.153	2.736	0.984	0.997	0.013	1.255			
> 67.35	0	2.736	∞	0.997	1	0.003	0.311			
	100					1	100	100	100	5.476

Tabel uji normal

v = k – r – 1

v = 7 – 2 – 1 = 4

α = 0.05

$\chi^2_{(v,\alpha)}$ = 9.488

χ^2 hasil perhitungan = 5.476

χ^2 hasil perhitungan < $\chi^2_{(v,\alpha)}$ → sehingga mengikuti distribusi normal

- Uji Seragam

Subgroup	1	2	3	4	5	6	7	8	9	10	Rata-rata
1	58.0	60.0	59.0	58.2	60.8	66.3	61.5	57.3	57.0	56.0	59.41
2	59.8	55.0	63.5	60.1	62.0	61.2	59.0	60.0	53.5	56.0	59.01
3	57.2	59.0	65.0	56.1	60.8	55.5	63.0	58.0	64.0	54.5	59.31
4	62.0	60.5	58.0	61.0	61.5	57.3	56.0	56.0	55.4	61.8	58.95
5	53.0	57.0	55.5	63.5	54.2	56.0	58.4	61.2	60.0	60.2	57.53
6	65.0	63.0	54.0	57.0	60.9	54.0	57.1	60.2	62.0	58.0	59.12
7	57.7	56.0	62.0	62.0	56.5	55.1	58.9	56.3	59.6	62.0	58.61
8	56.5	61.5	56.0	58.1	57.5	59.0	59.1	63.0	56.4	58.0	58.51
9	59.0	58.8	54.5	64.5	57.3	54.4	58.3	65.0	63.0	63.0	59.78
10	61.2	59.7	55.1	59.2	55.0	53.3	61.1	62.0	57.0	60.2	58.38
									Rata-rata		58.86

$\bar{\bar{x}}$ = 58.86

σ = 3.1

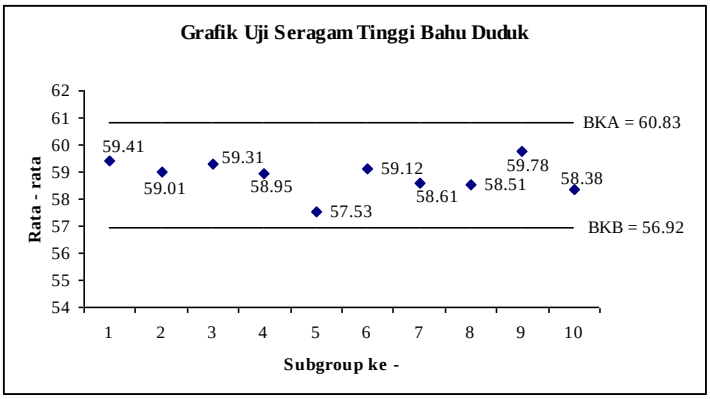
$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{3.1}{\sqrt{10}} = 0.98$$

$$BKB = \bar{\bar{x}} - c(\sigma_x)$$

= 58.86 – 2(0.98) = 56.92

$$BKA = \bar{\bar{x}} + c(\sigma_x)$$

= 58.86 + 2(0.98) = 60.83



Berdasarkan grafik di atas, dapat disimpulkan bahwa data seragam karena berada dalam batas BKA dan BKB.

- Uji Cukup

  $\sum Xi^2 = 58^2 + 59.8^2 + ... + 60.2^2 = 347842.46$

  $(\sum Xi)^2 = (58 + 59.8 + ... + 60.2)^2 = (5828.60)^2 = 33972577.96$

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

$$= \left[\frac{2/0.1 \sqrt{100(347842.46) - 33972577.96}}{5828.6} \right]^2 = 9.56$$

N = 100

N’ < N → data yang diperoleh sudah cukup

3. Tinggi Siku Duduk

- Uji Normal
  - k = 3.3 log n + 1

    = 3.3 log 100 + 1 = 7.6 ≈ 8 kelas
  - c = (Xmax – Xmin) / k

    = (32.5 – 19) / 7.6 = 1.78 ≈ 1.8

Batas Kelas	oi	Z1	Z2	P(Z1)	P (Z2)	P(Z2) - P(Z1)	ei	ei gab	oi gab	χ^2
< 18.95	0	- ∞	-1.904	0	0.028	0.028	2.847	10.819	10	0.062
18.95 – 20.75	10	-1.904	-1.236	0.028	0.108	0.080	7.972			
20.75 – 22.55	23	-1.236	-0.569	0.108	0.285	0.177	17.663	17.663	23	1.613
22.55 – 24.35	24	-0.569	0.099	0.285	0.539	0.255	25.462	25.462	24	0.084
24.35 – 26.15	21	0.099	0.767	0.539	0.778	0.239	23.891	23.891	21	0.350
26.15 – 27.95	15	0.767	1.434	0.778	0.924	0.146	14.590	14.590	15	0.012
27.95 – 29.75	3	1.434	2.102	0.924	0.982	0.058	5.797	7.575	7	0.044
29.75 – 31.55	3	2.102	2.769	0.982	0.997	0.015	1.497			
31.55 – 33.35	1	2.769	3.437	0.997	1.000	0.003	0.251			
> 33.35	0	3.437	∞	1.000	1	0.000	0.029			
	100					1	100	100	100	2.164

Tabel uji normal

v = k – r – 1

v = 6 – 2 – 1 = 3

α = 0.05

$\chi^2_{(v,\alpha)}$ = 7.815

χ^2 hasil perhitungan = 2.164

χ^2 hasil perhitungan < $\chi^2_{(v,\alpha)}$ → sehingga mengikuti distribusi normal

- Uji Seragam

Subgroup	1	2	3	4	5	6	7	8	9	10	rata - rata
1	25.2	22.5	24.5	25.4	26.3	20.4	27.0	21.9	28.0	26.0	24.72
2	32.5	24.0	23.0	23.1	20.4	22.8	24.0	25.0	27.5	22.0	24.43
3	26.0	24.5	22.5	25.3	21.6	19.4	27.0	28.8	24.0	27.0	24.61
4	22.0	21.5	24.5	19.1	24.0	22.0	26.0	24.0	26.0	24.0	23.31
5	26.2	25.0	19.0	23.0	22.1	23.0	24.2	23.0	24.2	22.5	23.22
6	26.5	21.1	23.0	22.2	28.4	30.0	22.0	19.8	26.0	21.6	24.06
7	22.8	20.0	30.8	25.6	19.0	21.5	26.4	20.0	27.5	22.5	23.61
8	22.0	24.4	22.5	24.0	24.0	25.3	25.0	26.5	22.5	26.5	24.27
9	27.5	25.0	20.5	21.5	22.2	27.7	23.6	24.5	23.0	23.0	23.85
10	23.0	27.5	21.8	23.3	26.7	20.8	25.2	24.0	24.7	30.5	24.75
									Rata-rata		24.08

$\bar{\bar{x}} = 24.08$

$\sigma = 2.69$

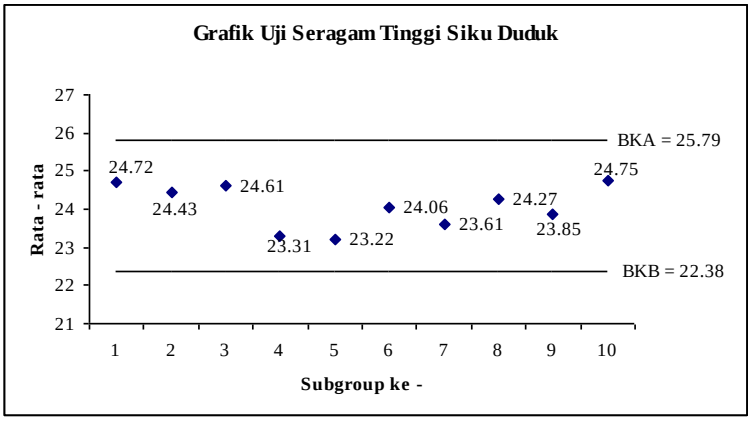
$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{2.69}{\sqrt{10}} = 0.85$$

$$BKB = \bar{\bar{x}} - c(\sigma_x)$$

$= 24.08 - 2(0.85) = 22.38$

$$BKA = \bar{\bar{x}} + c(\sigma_x)$$

$= 24.08 + 2(0.85) = 25.79$



Berdasarkan grafik di atas, dapat disimpulkan bahwa data seragam karena berada dalam batas BKA dan BKB.

- <u>Uji Cukup</u>

  $\sum Xi^2 = 25.2^2 + 32.5^2 + ... + 30.5^2 = 58718.75$

  $(\sum Xi)^2 = (25.2 + 32.5 + ... + 30.5)^2 = (2408.30)^2 = 5799908.89$

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

$$= \left[\frac{2/0.1 \sqrt{100(58718.75) - 5799908.89}}{2408.30} \right]^2 = 4.96$$

N = 100

N' < N → data yang diperoleh sudah cukup

4. Tinggi Popliteal

- Uji Normal
  - k = 3.3 log n + 1
    = 3.3 log 100 + 1 = 7.6 ≈ 8 kelas
  - c = (Xmax – Xmin) / k
    = (48.8 – 37.6) / 7.6 = 1.47 ≈ 1.5

Batas Kelas	oi	Z1	Z2	P(Z1)	P (Z2)	P(Z2) - P(Z1)	ei	ei gab	oi gab	χ^2
< 37.55	0	- ∞	-2.057	0	0.020	0.020	1.985	7.133	9	0.489
37.55 – 39.05	9	-2.057	-1.466	0.020	0.071	0.051	5.148			
39.05 – 40.55	13	-1.466	-0.875	0.071	0.191	0.119	11.944	11.944	13	0.093
40.55 – 42.05	17	-0.875	-0.284	0.191	0.388	0.197	19.737	19.737	17	0.379
42.05 – 43.55	28	-0.284	0.307	0.388	0.620	0.232	23.233	23.233	28	0.978
43.55 – 45.05	18	0.307	0.898	0.620	0.815	0.195	19.483	19.483	18	0.113
45.05 – 46.55	8	0.898	1.488	0.815	0.932	0.116	11.639	11.639	8	1.138
46.55 – 48.05	4	1.488	2.079	0.932	0.981	0.050	4.952	6.831	7	0.004
48.05 – 49.55	3	2.079	2.670	0.981	0.996	0.015	1.500			
> 49.55	0	2.670	∞	0.996	1	0.004	0.379			
	100					1	100	100	100	3.194

Tabel uji normal

v = k – r – 1

v = 7 – 2 – 1 = 4

α = 0.05

$\chi^2_{(v,\alpha)}$ = 9.488

χ^2 hasil perhitungan = 3.194

χ^2 hasil perhitungan < $\chi^2_{(v,\alpha)}$ → sehingga mengikuti distribusi normal

- Uji Seragam

Subgroup	1	2	3	4	5	6	7	8	9	10	rata - rata
1	42.0	41.5	45.0	41.6	38.7	43.5	43.2	39.4	46.0	43.7	42.46
2	48.8	39.5	43.5	45.5	41.5	41.6	44.0	42.5	38.8	43.0	42.91
3	43.0	42.0	48.0	45.0	37.6	42.2	47.0	39.5	42.3	38.0	42.79
4	46.5	45.0	46.4	43.7	42.5	41.3	42.5	38.3	43.6	42.3	43.21
5	46.5	43.8	43.0	41.5	42.4	42.5	42.3	40.5	43.7	39.0	42.52
6	45.0	46.2	39.0	40.4	43.5	41.8	43.1	43.2	41.0	41.9	42.51
7	45.9	45.7	40.0	42.1	44.2	42.0	39.4	42.0	43.2	42.1	42.66
8	40.5	43.5	48.5	44.3	40.3	39.5	42.2	43.4	41.5	44.0	42.77
9	47.8	44.5	39.7	48.6	39.0	43.0	41.1	44.1	44.0	41.2	43.30
10	44.6	38.6	43.0	47.6	42.7	39.2	44.7	42.0	40.4	43.2	42.60
									Rata-rata		42.77

$\bar{\bar{x}} = 42.77$

$\sigma = 2.54$

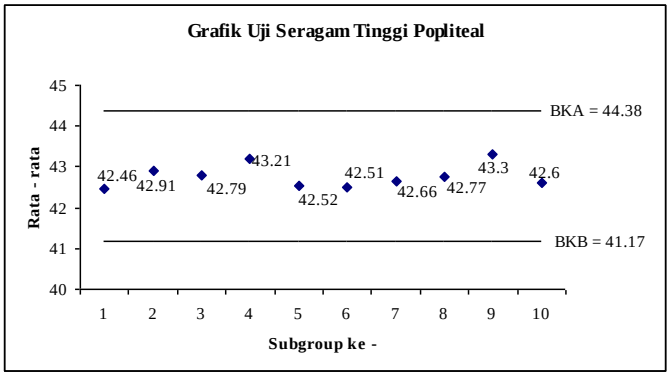
$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{2.54}{\sqrt{10}} = 0.80$$

$$BKB = \bar{\bar{x}} - c(\sigma_x)$$

$= 42.77 - 2(0.80) = 41.17$

$$BKA = \bar{\bar{x}} + c(\sigma_x)$$

$= 42.77 + 2(0.80) = 44.38$



Berdasarkan grafik di atas, dapat disimpulkan bahwa data seragam karena berada dalam batas BKA dan BKB.

- Uji Cukup

  $\sum Xi^2 = 42^2 + 48.8^2 + ... + 43.2^2 = 183272.32$

  $(\sum Xi)^2 = (42+ 48.8 + ... + 43.2)^2 = (4191.60)^2 = 17569510.56$

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

$$= \left[\frac{2/0.1\sqrt{100(183272.32) - 17569510.56}}{4191.60} \right]^2 = 17.25$$

N = 100

N' < N → data yang diperoleh sudah cukup

5. Tebal Paha

- Uji Normal
  - k = 3.3 log n + 1

    = 3.3 log 100 + 1 = 7.6 ≈ 8 kelas
  - c = (Xmax – Xmin) / k

    = (21.8 – 8.6) / 7.6 = 1.74 ≈ 1.7

Batas Kelas	oi	Z1	Z2	P(Z1)	P (Z2)	P(Z2) - P(Z1)	ei	ei gab	oi gab	χ^2
< 8.55	0	- ∞	-2.267	0	0.012	0.012	1.170			
8.55 – 10.25	7	-2.267	-1.646	0.012	0.050	0.038	3.821	15.275	15	0.005
10.25 – 11.95	8	-1.646	-1.025	0.050	0.153	0.103	10.284			
11.95 – 13.65	18	-1.025	-0.404	0.153	0.343	0.190	19.047	19.047	18	0.058
13.65 – 15.35	24	-0.404	0.217	0.343	0.586	0.243	24.281	24.281	24	0.003
15.35 – 17.05	24	0.217	0.838	0.586	0.799	0.213	21.306	21.306	24	0.341
17.05 – 18.75	12	0.838	1.459	0.799	0.928	0.129	12.869	12.869	12	0.059
18.75 – 20.45	5	1.459	2.080	0.928	0.981	0.053	5.349			
20.45 – 22.15	2	2.080	2.701	0.981	0.997	0.015	1.529	7.223	7	0.007
> 22.15	0	2.701	∞	0.997	1	0.003	0.345			
	100					1	100	100	100	0.472

Tabel uji normal

$v = k - r - 1$

$v = 6 - 2 - 1 = 3$

$\alpha = 0.05$

$\chi^2_{(v,\alpha)} = 7.815$

χ^2 hasil perhitungan = 0.472

χ^2 hasil perhitungan < $\chi^2_{(v,\alpha)}$ → sehingga mengikuti distribusi normal

- Uji Seragam

Subgroup	1	2	3	4	5	6	7	8	9	10	rata - rata
1	13.0	16.5	17.0	14.5	13.2	11.0	15.0	11.7	16.5	18.0	14.64
2	10.0	10.0	15.0	15.4	12.2	16.1	18.5	20.0	19.5	15.1	15.18
3	8.6	12.1	14.0	15.5	18.0	14.5	18.3	18.5	17.0	15.7	15.22
4	15.0	14.0	17.0	17.2	10.5	17.6	18.2	16.0	16.2	14.5	15.62
5	17.5	18.0	14.0	16.2	15.9	13.5	13.2	13.4	11.8	10.5	14.51
6	17.0	18.5	12.5	19.0	16.3	12.0	9.2	20.5	11.2	12.0	14.19
7	14.2	13.5	15.5	16.6	14.4	10.3	12.7	14.7	13.5	16.4	14.18
8	14.5	12.4	14.2	14.7	18.8	14.8	15.8	15.8	17.0	9.5	14.75
9	9.3	12.5	13.1	14.3	15.0	21.8	14.1	14.7	13.3	15.1	14.32
10	11.0	19.0	16.6	15.6	13.6	9.6	16.4	14.5	14.3	18.0	14.86
									Rata-rata		14.75

$\bar{\bar{x}} = 14.75$

$\sigma = 2.74$

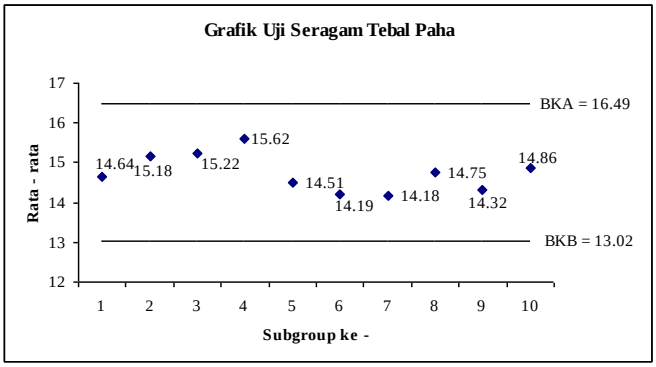
$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{2.74}{\sqrt{10}} = 0.87$$

$$BKB = \bar{\bar{x}} - c(\sigma_x)$$

$= 14.75 - 2(0.87) = 13.02$

$$BKA = \bar{\bar{x}} + c(\sigma_x)$$

$= 14.75 + 2(0.87) = 16.49$



Berdasarkan grafik di atas, dapat disimpulkan bahwa data seragam karena berada dalam batas BKA dan BKB.

- Uji Cukup

$\sum Xi^2 = 13^2 + 10^2 + ... + 18^2 = 22662.55$

$(\sum Xi)^2 = (13+ 10 + ... + 18)^2 = (1446)^2 = 2090916$

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

$$= \left[\frac{2/0.1\sqrt{100(2090916) - 17569510.56}}{1446} \right]^2 = 33.54$$

N = 100

N’ < N → data yang diperoleh sudah cukup

6. Pantat Popliteal

- Uji Normal
  - k = 3.3 log n + 1
    = 3.3 log 100 + 1 = 7.6 ≈ 8 kelas
  - c = (Xmax – Xmin) / k
    = (52.3 – 41.2) / 7.6 = 1.46 ≈ 1.5

Batas Kelas	oi	Z1	Z2	P(Z1)	P (Z2)	P(Z2) - P(Z1)	ei	ei gab	oi gab	χ^2
< 41.15	0	- ∞	-2.185	0	0.014	0.014	1.445	5.381	7	0.487
41.15 – 42.65	7	-2.185	-1.609	0.014	0.054	0.039	3.936			
42.65 – 44.15	12	-1.609	-1.033	0.054	0.151	0.097	9.699	9.699	12	0.546
44.15 – 45.65	12	-1.033	-0.457	0.151	0.324	0.173	17.301	17.301	12	1.624
45.65 – 47.15	24	-0.457	0.119	0.324	0.547	0.224	22.350	22.350	24	0.122
47.15 – 48.65	19	0.119	0.695	0.547	0.756	0.209	20.910	20.910	19	0.175
48.65 – 50.15	14	0.695	1.271	0.756	0.898	0.142	14.168	14.168	14	0.002
50.15 – 51.65	11	1.271	1.847	0.898	0.968	0.070	6.951	10.191	12	0.321
51.65 – 53.15	1	1.847	2.423	0.968	0.992	0.025	2.469			
> 53.15	0	2.423	∞	0.992	1	0.008	0.770			
	100					1	100	100	100	3.277

Tabel uji normal

v = k – r – 1

v = 7 – 2 – 1 = 4

α = 0.05

$\chi^2_{(v,\alpha)}$ = 9.488

χ^2 hasil perhitungan = 3.277

χ^2 hasil perhitungan < $\chi^2_{(v,\alpha)}$ → sehingga mengikuti distribusi normal

- <u>Uji Seragam</u>

Subgroup	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**rata - rata**
1	45.0	51.5	46.0	45.5	44.1	48.5	49.0	48.0	49.0	44.9	47.15
2	42.5	47.0	43.0	46.8	45.8	42.3	51.0	46.3	48.4	46.3	45.94
3	48.0	47.8	49.0	43.5	47.4	47.1	50.5	49.5	46.5	44.8	47.18
4	45.2	51.0	43.5	45.5	43.9	42.6	46.4	46.0	47.0	45.0	45.61
5	46.8	49.0	50.0	49.2	48.5	50.5	46.3	47.0	49.0	43.0	47.93
6	50.0	51.0	47.0	43.2	51.1	46.6	43.1	49.0	48.3	48.8	47.81
7	43.0	46.3	47.5	48.0	48.4	44.9	48.4	44.5	41.6	47.8	46.04
8	48.6	50.3	46.6	46.3	51.2	47.8	44.9	46.0	46.3	41.2	46.92
9	42.5	45.0	45.5	49.9	47.5	52.3	47.0	48.0	41.3	48.4	46.74
10	46.0	49.7	43.8	47.3	44.1	43.8	46.5	50.3	51.0	48.7	47.12
									Rata-rata		46.84

$\bar{\bar{x}}$ = 46.84

σ = 2.6

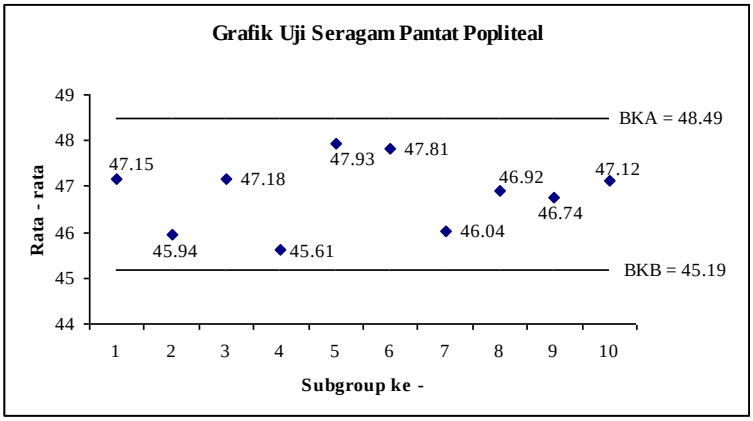
$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{2.6}{\sqrt{10}} = 0.82$$

$$BKB = \bar{\bar{x}} - c(\sigma_x)$$

$$= 46.84 - 2(0.82) = 45.19$$

$$BKA = \bar{\bar{x}} + c(\sigma_x)$$

$$= 46.84 + 2(0.82) = 48.49$$



Berdasarkan grafik di atas, dapat disimpulkan bahwa data seragam karena berada dalam batas BKA dan BKB.

- <u>Uji Cukup</u>

  $\sum Xi^2 = 45^2 + 42.5^2 + ... + 48.7^2 = 220323.31$

  $(\sum Xi)^2 = (45 + 42.5 + ... + 48.7)^2 = (4637.2)^2 = 21503623.84$

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

  $$= \left[\frac{2/0.1 \sqrt{100(220323.31) - 21503623.84}}{4637.2} \right]^2 = 9.83$$

  N = 100

  N' < N → data yang diperoleh sudah cukup

7. Panjang Sandaran

- Uji Normal
  - $k = 3.3 \log n + 1$

    $= 3.3 \log 100 + 1 = 7.6 \approx 8$ kelas
  - $c = (Xmax – Xmin) / k$

    $= (60 – 40) / 7.6 = 2.632 \approx 2.6$

Batas Kelas	oi	Z1	Z2	P(Z1)	P (Z2)	P(Z2) - P(Z1)	ei	ei gab	oi gab	χ^2
< 39.95	0	- ∞	-1.986	0	0.024	0.024	2.352	7.311	6	0.235
39.95 – 42.55	6	-1.986	-1.453	0.024	0.073	0.050	4.960			
42.55 – 45.15	14	-1.453	-0.920	0.073	0.179	0.106	10.568	10.568	14	1.114
45.15 – 47.75	19	-0.920	-0.387	0.179	0.349	0.171	17.061	17.061	19	0.220
47.75 – 50.35	19	-0.387	0.146	0.349	0.558	0.209	20.867	20.867	19	0.167
50.35 – 52.95	13	0.146	0.679	0.558	0.751	0.193	19.339	19.339	13	2.078
52.95 – 55.55	14	0.679	1.212	0.751	0.887	0.136	13.580	13.580	14	0.013
55.55 – 58.15	9	1.212	1.745	0.887	0.960	0.072	7.225	11.273	15	1.232
58.15 – 60.75	6	1.745	2.278	0.960	0.989	0.029	2.912			
> 60.75	0	2.278	∞	0.989	1	0.011	1.136			
	100					1	100	100	100	5.060

Tabel uji normal

$v = k – r – 1$

$v = 7 – 2 – 1 = 4$

$\alpha = 0.05$

$\chi^2_{(v,\alpha)} = 9.488$

χ^2 hasil perhitungan = 5.060

χ^2 hasil perhitungan < $\chi^2_{(v,\alpha)}$ → sehingga mengikuti distribusi normal

- Uji Seragam

Subgroup	1	2	3	4	5	6	7	8	9	10	rata - rata
1	42.0	45.5	56.0	56.0	48.6	56.5	54.0	43.0	51.0	45.0	49.76
2	44.5	54.0	60.0	58.7	49.0	46.0	56.0	51.6	45.0	43.0	50.69
3	54.0	46.0	59.0	59.0	47.0	44.0	46.5	47.0	52.9	49.0	50.44
4	46.0	48.0	54.0	52.0	56.0	45.0	49.6	43.5	50.0	41.0	48.51
5	50.0	49.0	48.0	44.0	54.0	49.0	49.9	48.0	50.3	44.0	48.62
6	57.0	43.0	57.0	43.0	43.0	51.0	52.7	49.0	46.0	50.0	49.17
7	51.2	47.1	56.0	55.0	47.7	47.8	58.7	42.0	50.0	52.5	50.80
8	46.0	52.5	53.6	53.0	42.2	52.0	54.0	53.0	41.5	53.6	50.14
9	47.6	53.0	59.0	54.0	47.1	53.0	48.4	50.2	45.5	46.5	50.43
10	45.0	52.5	46.0	50.5	45.5	47.0	50.5	56.2	46.0	40.0	47.92
									Rata-rata		49.65

$\bar{\bar{x}} = 49.65$

$\sigma = 4.88$

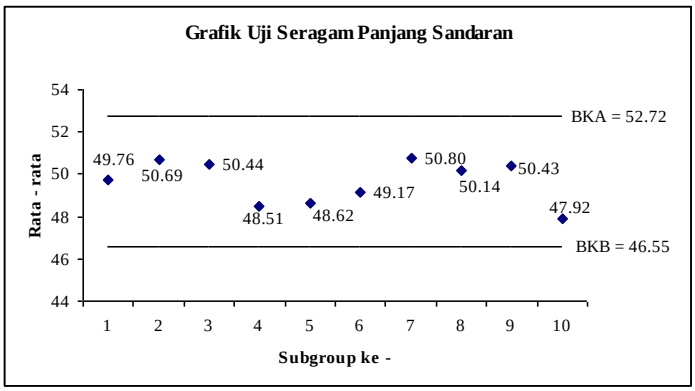
$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{4.88}{\sqrt{10}} = 1.54$$

$$BKB = \bar{\bar{x}} - c(\sigma_x)$$

$= 49.65 - 2(1.54) = 46.55$

$$BKA = \bar{\bar{x}} + c(\sigma_x)$$

$= 49.65 + 2(1.54) = 52.72$



Berdasarkan grafik di atas, dapat disimpulkan bahwa data seragam karena berada dalam batas BKA dan BKB.

- Uji Cukup

  $\sum Xi^2 = 42^2 + 44.5^2 + ... + 40^2 = 248917.31$

  $(\sum Xi)^2 = (42+ 44.5 + ... + 40)^2 = (4914.10)^2 = 24148378.81$

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

$$= \left[\frac{2/0.1\sqrt{100(248917.31) - 24148378.81}}{4914.10} \right]^2 = 12.31$$

N = 100

N' < N → data yang diperoleh sudah cukup

8. Lebar Pinggul

- Uji Normal
  - k = 3.3 log n + 1

    = 3.3 log 100 + 1 = 7.6 ≈ 8 kelas
  - c = (Xmax – Xmin) / k

    = (46 – 31) / 7.6 = 1.974 ≈ 2

Batas Kelas	oi	Z1	Z2	P(Z1)	P (Z2)	P(Z2) - P(Z1)	ei	ei gab	oi gab	χ^2
< 30.95	0	- ∞	-1.948	0	0.026	0.026	2.569	9.323	5	2.004
30.95 – 32.95	5	-1.948	-1.321	0.026	0.093	0.068	6.754			
32.95 – 34.95	21	-1.321	-0.694	0.093	0.244	0.151	15.062	15.062	21	2.341
34.95 – 36.95	27	-0.694	-0.067	0.244	0.473	0.230	22.952	22.952	27	0.714
36.95 – 38.95	20	-0.067	0.560	0.473	0.712	0.239	23.902	23.902	20	0.637
38.95 – 40.95	15	0.560	1.188	0.712	0.882	0.170	17.011	17.011	15	0.238
40.95 – 42.95	5	1.188	1.815	0.882	0.965	0.083	8.272	11.751	12	0.005
42.95 – 44.95	6	1.815	2.442	0.965	0.993	0.027	2.748			
44.95 – 46.95	1	2.442	3.069	0.993	0.999	0.006	0.623			
> 46.95	0	3.069	∞	0.999	1	0.001	0.107			
	100					1	100	100	100	5.939

Tabel uji normal

$v = k - r - 1$

$v = 6 - 2 - 1 = 3$

$\alpha = 0.05$

$\chi^2_{(v,\alpha)} = 7.815$

χ^2 hasil perhitungan = 5.939

χ^2 hasil perhitungan < $\chi^2_{(v,\alpha)}$ → sehingga mengikuti distribusi normal

- Uji Seragam

Subgroup	1	2	3	4	5	6	7	8	9	10	rata - rata
1	37.2	38.7	35.6	39.6	35.2	40.8	40.5	37.0	40.0	37.5	38.21
2	39.6	33.4	36.9	40.0	40.5	39.0	33.0	40.4	36.7	42.3	38.18
3	34.2	38.4	34.0	36.9	39.2	35.7	37.5	31.0	33.4	36.0	35.63
4	34.3	34.0	41.3	39.5	33.5	34.0	38.7	38.0	43.9	40.0	37.72
5	38.5	37.0	35.5	37.0	34.2	40.9	34.6	33.5	37.0	34.0	36.22
6	35.0	42.0	38.5	32.5	35.8	33.8	36.6	44.8	35.3	35.8	37.01
7	46.0	36.0	36.0	36.1	37.8	32.5	37.2	34.0	44.0	34.6	37.42
8	35.4	38.8	41.2	35.2	35.8	35.7	33.3	36.5	35.0	36.0	36.29
9	36.7	32.0	44.0	36.0	36.0	44.5	32.0	41.7	43.4	37.3	38.36
10	34.5	34.5	36.4	34.5	37.8	37.3	39.8	34.7	37.0	39.4	36.59
									Rata-rata		37.16

$\bar{\bar{x}} = 37.16$

$\sigma = 3.19$

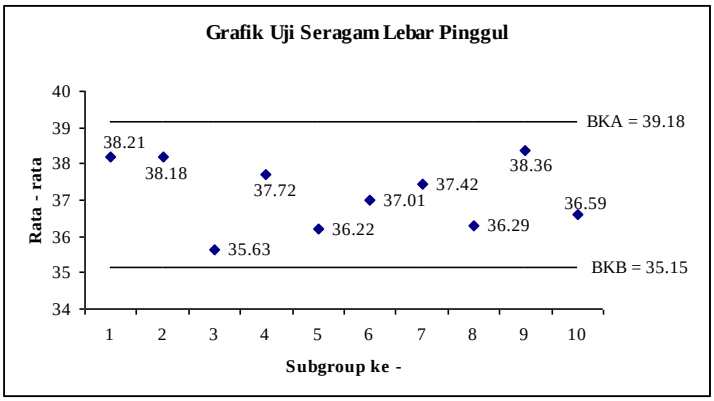
$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{3.19}{\sqrt{10}} = 1.008$$

$$BKB = \bar{\bar{x}} - c(\sigma_x)$$

$= 37.16 - 2(1.008) = 35.15$

$$BKA = \bar{\bar{x}} + c(\sigma_x)$$

$= 37.16 + 2(1.008) = 39.18$



Berdasarkan grafik di atas, dapat disimpulkan bahwa data seragam karena berada dalam batas BKA dan BKB.

- Uji Cukup

$\sum Xi^2 = 37.2^2 + 39.6^2 + ... + 39.4^2 = 139115.61$

$(\sum Xi)^2 = (37.2 + 39.6 + ... + 39.4)^2 = (3716.30)^2 = 13810885.69$

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

$$= \left[\frac{2/0.1 \sqrt{100(139115.61) - 13810885.69}}{3716.30} \right]^2 = 2.92$$

N = 100

N' < N → data yang diperoleh sudah cukup

9. Lebar Bahu

- Uji Normal
  - k = 3.3 log n + 1

    = 3.3 log 100 + 1 = 7.6 ≈ 8 kelas
  - c = (Xmax – Xmin) / k

    = (51.5 – 39) / 7.6 = 1.645 ≈ 1.7

Batas Kelas	oi	Z1	Z2	P(Z1)	P (Z2)	P(Z2) - P(Z1)	ei	ei gab	oi gab	χ^2
< 38.95	0	- ∞	-1.832	0	0.033	0.033	3.350	10.696	11	0.009
38.95 – 40.65	11	-1.832	-1.243	0.033	0.107	0.073	7.347			
40.65 – 42.35	19	-1.243	-0.654	0.107	0.257	0.150	14.961	14.961	19	1.090
42.35 – 44.05	19	-0.654	-0.065	0.257	0.474	0.217	21.750	21.750	19	0.348
44.05 – 45.75	19	-0.065	0.524	0.474	0.700	0.226	22.574	22.574	19	0.566
45.75 – 47.45	17	0.524	1.113	0.700	0.867	0.167	16.728	16.728	17	0.004
47.45 – 49.15	9	1.113	1.702	0.867	0.956	0.088	8.850	13.291	15	0.220
49.15 – 50.85	4	1.702	2.291	0.956	0.989	0.033	3.342			
50.85 – 52.55	2	2.291	2.879	0.989	0.998	0.009	0.900			
> 52.55	0	2.879	∞	0.998	1	0.002	0.199			
	100					1	100	100	100	2.237

Tabel uji normal

v = k – r – 1

v = 6 – 2 – 1 = 3

α = 0.05

$\chi^2_{(v,\alpha)}$ = 7.815

χ^2 hasil perhitungan = 2.237

χ^2 hasil perhitungan < $\chi^2_{(v,\alpha)}$ → sehingga mengikuti distribusi normal

- <u>Uji Seragam</u>

Subgroup	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**rata - rata**
1	43.0	39.5	45.0	46.2	43.3	40.5	42.5	44.3	45.2	40.7	42.78
2	42.0	41.5	46.0	41.3	42.3	42.5	48.2	41.5	42.0	41.5	42.88
3	39.0	41.5	48.0	42.8	44.4	41.8	50.0	44.4	45.0	44.7	44.16
4	41.0	42.7	46.5	39.1	43.3	48.4	42.2	48.5	48.7	42.0	43.77
5	45.0	40.4	45.5	40.6	49.5	46.5	45.6	46.7	46.0	40.0	44.58
6	49.9	43.0	46.0	45.5	47.0	45.0	44.4	42.9	46.0	47.0	45.67
7	43.5	46.0	40.5	43.9	42.0	43.0	44.8	40.5	45.2	44.5	43.39
8	42.5	48.0	45.4	40.5	41.0	42.0	48.8	46.0	48.5	43.2	44.59
9	44.4	45.0	46.0	44.0	46.4	41.7	46.5	51.0	47.0	40.2	45.22
10	40.8	43.0	51.5	49.6	43.0	43.0	42.0	43.2	47.1	48.3	45.15
									Rata-rata		44.22

$\bar{\bar{x}}$ = 44.22

σ = 2.87

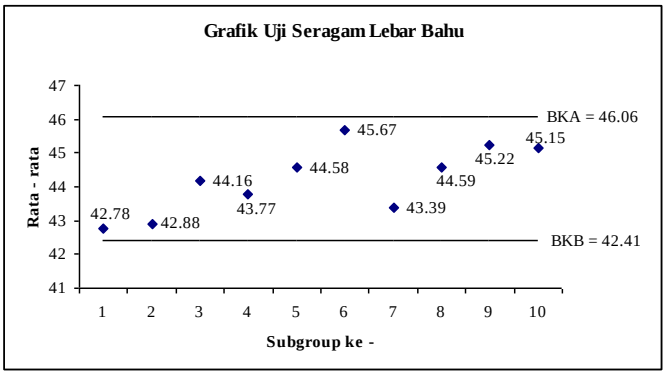
$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{2.87}{\sqrt{10}} = 0.91$$

$$BKB = \bar{\bar{x}} - c(\sigma_x)$$

$$= 44.22 - 2(0.91) = 42.41$$

$$BKA = \bar{\bar{x}} + c(\sigma_x)$$

$$= 44.22 + 2(0.91) = 46.06$$



Berdasarkan grafik di atas, dapat disimpulkan bahwa data seragam karena berada dalam batas BKA dan BKB.

- Uji Cukup

$\sum Xi^2 = 43^2 + 42^2 + ... + 48.3^2 = 196987.56$

$(\sum Xi)^2 = (43 + 42 + ... + 48.3)^2 = (4429.00)^2 = 19616041$

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

$$= \left[\frac{2/0.1 \sqrt{100(196987.56) - 19616041}}{4429.00} \right]^2 = 1.67$$

N = 100

N' < N → data yang diperoleh sudah cukup

10. Panjang Lengan Bawah

- Uji Normal
  - k = 3.3 log n + 1

    = 3.3 log 100 + 1 = 7.6 ≈ 8 kelas
  - c = (Xmax – Xmin) / k

    = (34 – 21) / 7.6 = 1.711≈ 1.7

Batas Kelas	oi	Z1	Z2	P(Z1)	P (Z2)	P(Z2) - P(Z1)	ei	ei gab	oi gab	χ^2
< 20.95	0	- ∞	-2.254	0	0.012	0.012	1.209	7.380	8	0.052
20.95 - 22.65	8	-2.254	-1.448	0.012	0.074	0.062	6.171			
22.65 - 24.35	19	-1.448	-0.642	0.074	0.260	0.187	18.664	18.664	19	0.006
24.35 - 26.05	31	-0.642	0.164	0.260	0.565	0.305	30.472	30.472	31	0.009
26.05 - 27.75	28	0.164	0.970	0.565	0.834	0.269	26.885	26.885	28	0.046
27.75 - 29.45	11	0.970	1.776	0.834	0.962	0.128	12.814	16.600	14	0.407
29.45 - 31.15	2	1.776	2.582	0.962	0.995	0.033	3.294			
31.15 - 32.85	0	2.582	3.388	0.995	1.000	0.005	0.456			
32.85 - 34.55	1	3.388	4.194	1.000	1.000	0.000	0.034			
> 34.55	0	4.194	∞	1.000	1	0.000	0.001			
	100					1	100	100	100	0.521

Tabel uji normal

v = k – r – 1

v = 5 – 2 – 1 = 2

α = 0.05

$\chi^2_{(v,\alpha)}$ = 5.991

χ^2 hasil perhitungan = 0.521

χ^2 hasil perhitungan < $\chi^2_{(v,\alpha)}$ → sehingga mengikuti distribusi normal

- Uji Seragam

Subgroup	1	2	3	4	5	6	7	8	9	10	rata - rata
1	24.0	28.0	25.0	24.0	23.5	23.7	25.0	22.5	28.0	25.0	24.87
2	28.0	23.2	28.0	29.5	25.0	26.5	23.0	24.4	27.0	22.0	25.66
3	26.0	25.5	24.0	27.0	26.0	25.2	27.0	26.0	26.5	26.5	25.97
4	26.0	28.0	28.0	23.0	25.0	22.6	23.7	24.0	27.5	25.0	25.28
5	26.0	27.5	29.0	26.0	27.0	34.0	29.5	23.0	23.5	21.3	26.68
6	22.0	27.0	25.0	26.5	25.0	26.0	27.5	25.0	24.5	21.5	25.00
7	24.0	27.0	26.0	23.0	27.5	27.0	25.0	24.0	26.5	28.5	25.85
8	25.0	27.3	21.0	24.5	27.0	27.5	24.2	26.0	29.0	27.5	25.90
9	27.0	27.5	22.0	25.0	25.0	26.0	25.4	27.0	27.0	24.5	25.64
10	26.5	27.5	28.0	24.0	24.0	24.0	26.5	28.5	26.9	26.0	26.19
									Rata-rata		25.70

$\bar{\bar{x}} = 25.704$

$\sigma = 2.109$

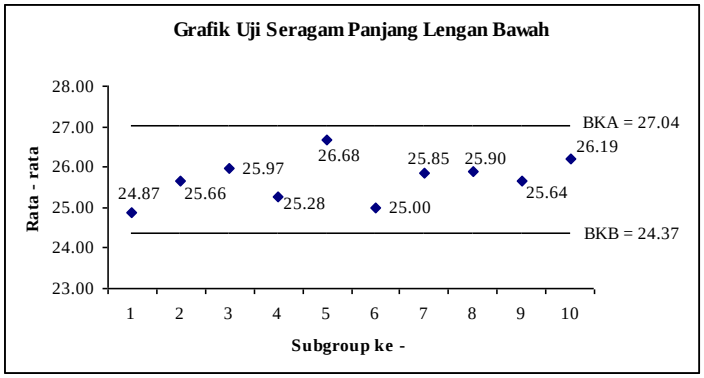
$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{2.109}{\sqrt{10}} = 0.67$$

$$BKB = \bar{\bar{x}} - c(\sigma_x)$$

$= 25.704 - 2(0.67) = 24.37$

$$BKA = \bar{\bar{x}} + c(\sigma_x)$$

$= 25.704 + 2(0.67) = 27.04$



Berdasarkan grafik di atas, dapat disimpulkan bahwa data seragam karena berada dalam batas BKA dan BKB.

- Uji Cukup

  $\sum Xi^2 = 24^2 + 28^2 + ... + 26^2 = 66509.92$

  $(\sum Xi)^2 = (24+ 28 + ... + 26)^2 = (2570.4)^2 = 6606956.16$

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

$$= \left[\frac{2/0.1 \sqrt{100(66509.92) - 6606956.16}}{2570.4} \right]^2 = 2.67$$

  N = 100

  N' < N → data yang diperoleh sudah cukup

11. Tinggi Badan Tegak

- Uji Normal
  - k = 3.3 log n + 1

    = 3.3 log 100 + 1 = 7.6 ≈ 8 kelas
  - c = (Xmax – Xmin) / k

    = (177.3 – 155) / 7.6 = 2.934 ≈ 2.9

Batas Kelas	oi	Z1	Z2	P(Z1)	P (Z2)	P(Z2) - P(Z1)	ei	ei gab	oi gab	χ^2
< 154.95	0	- ∞	-2.008	0	0.022	0.022	2.233	6.705	4	1.091
154.95 - 157.85	4	-2.008	-1.498	0.022	0.067	0.045	4.472			
157.85 - 160.75	14	-1.498	-0.988	0.067	0.161	0.094	9.443	9.443	14	2.200
160.75 - 163.65	15	-0.988	-0.479	0.161	0.316	0.155	15.460	15.460	15	0.014
163.65 - 166.55	19	-0.479	0.031	0.316	0.512	0.196	19.630	19.630	19	0.020
166.55 - 169.45	17	0.031	0.541	0.512	0.706	0.193	19.329	19.329	17	0.281
169.45 - 172.35	12	0.541	1.050	0.706	0.853	0.148	14.759	14.759	12	0.516
172.35 - 175.25	12	1.050	1.560	0.853	0.941	0.087	8.739	8.739	12	1.217
175.25 - 178.15	7	1.560	2.070	0.941	0.981	0.040	4.013	5.936	7	0.191
> 178.5	0	2.070	∞	0.981	1	0.019	1.923			
	100					1	100	100	100	5.528

Tabel uji normal

v = k – r – 1

v = 8 – 2 – 1 = 5

α = 0.05

$\chi^2_{(v,\alpha)}$ = 11.07

χ^2 hasil perhitungan = 5.528

χ^2 hasil perhitungan < $\chi^2_{(v,\alpha)}$ → sehingga mengikuti distribusi normal

- Uji Seragam

Subgroup	1	2	3	4	5	6	7	8	9	10	rata - rata
1	160.0	168.0	169.0	177.3	162.3	164.5	161.0	176.5	168.5	171.7	167.88
2	162.5	164.0	167.0	165.6	166.5	169.5	175.0	165.0	163.0	164.8	166.29
3	156.3	156.4	166.0	170.3	175.0	159.0	173.0	173.0	167.5	165.0	166.15
4	165.2	166.0	171.0	168.6	170.0	168.0	174.0	171.4	169.5	175.5	169.76
5	162.5	167.0	156.5	161.4	168.0	165.0	164.0	168.8	163.0	159.3	162.97
6	167.0	164.0	176.5	163.2	169.0	170.0	168.2	175.0	158.0	158.0	166.89
7	173.0	159.0	173.0	161.0	158.5	168.0	173.0	162.0	173.0	161.0	166.15
8	163.0	164.0	164.5	155.0	168.0	177.0	172.0	167.0	162.0	159.0	165.15
9	160.0	169.0	165.0	158.0	171.5	160.0	160.0	166.0	164.0	163.5	163.70
10	165.0	159.0	177.2	159.4	173.0	173.0	176.5	171.0	162.0	171.9	168.80
									Rata-rata		166.37

$\bar{\bar{x}}$ = 166.37

σ = 5.69

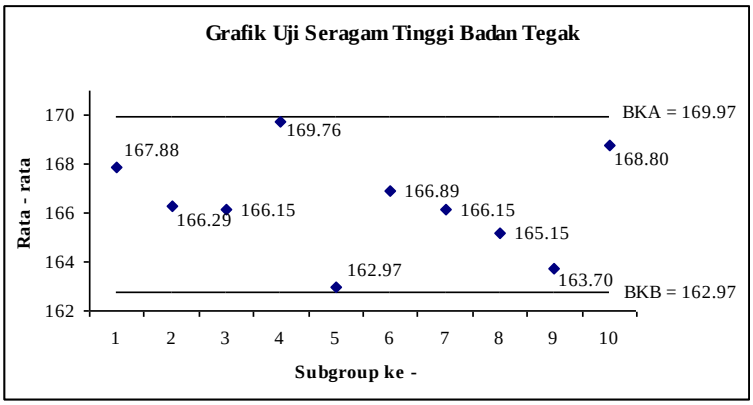
$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{5.69}{\sqrt{10}} = 1.78$$

$$BKB = \bar{\bar{x}} - c(\sigma_x)$$

= 166.37 – 2(1.78) = 162.97

$$BKA = \bar{\bar{x}} + c(\sigma_x)$$

= 10.26 + 2(1.78) = 169.97



Berdasarkan grafik di atas, dapat disimpulkan bahwa data seragam karena berada dalam batas BKA dan BKB.

- Uji Cukup

  $\sum Xi^2 = 160^2 + 162.5^2 + ... + 171.9^2 = 2773664$

  $(\sum Xi)^2 = (160 + 162.5 + ... + 171.9)^2 = (16304.60)^2 = 265839981.16$

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

  $$= \left[\frac{2/0.1 \sqrt{100(2773664) - 265839981.16}}{16304.6} \right]^2 = 17.34$$

  N = 100

  N’ < N → data yang diperoleh sudah cukup

12. Pangkal ke Tangan

- Uji Normal
  - k = 3.3 log n + 1

    = 3.3 log 100 + 1 = 7.6 ≈ 8 kelas
  - c = (Xmax – Xmin) / k

    = (15 – 5) / 7.6 = 1.316 ≈ 1.3

Batas Kelas	oi	Z1	Z2	P(Z1)	P (Z2)	P(Z2) - P(Z1)	ei	ei gab	oi gab	χ^2
< 4.95	0	- ∞	-2.472	0	0.007	0.007	0.671	5.342	2	2.091
4.95 - 6.25	2	-2.472	-1.613	0.007	0.053	0.047	4.671			
6.25 - 7.55	20	-1.613	-0.753	0.053	0.226	0.172	17.239	17.239	20	0.442
7.55 - 8.85	33	-0.753	0.107	0.226	0.543	0.317	31.686	31.686	33	0.055
8.85 - 10.15	32	0.107	0.967	0.543	0.833	0.291	29.057	29.057	32	0.298
10.15 - 11.45	10	0.967	1.827	0.833	0.966	0.133	13.291	16.677	13	0.811
11.45 - 12.75	1	1.827	2.687	0.966	0.996	0.030	3.025			
12.75 - 14.05	1	2.687	3.547	0.996	1.000	0.003	0.341			
14.05 - 15.35	1	3.547	4.406	1.000	1.000	0.000	0.019			
> 15.35	0	4.406	∞	1.000	1	0.000	0.001			
	100					1	100	100	100	3.696

Tabel uji normal

v = k – r – 1

v = 5 – 2 – 1 = 2

α = 0.05

$\chi^2_{(v,\alpha)}$ = 5.991

χ^2 hasil perhitungan = 3.696

χ^2 hasil perhitungan < $\chi^2_{(v,\alpha)}$ → sehingga mengikuti distribusi normal

- Uji Seragam

Subgroup	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**rata - rata**
1	9.0	8.0	9.0	7.3	9.0	10.5	6.0	10.5	6.5	7.5	8.33
2	8.0	9.0	7.0	8.5	9.1	8.0	8.0	9.5	10.0	9.5	8.66
3	9.6	7.5	8.5	8.0	8.0	10.5	7.4	10.5	9.0	7.3	8.63
4	9.0	7.2	8.0	10.0	9.0	10.0	8.5	8.0	7.0	10.0	8.67
5	8.0	8.0	9.0	9.0	10.0	8.0	8.5	8.0	8.5	11.0	8.80
6	8.8	9.0	7.0	8.0	7.0	8.0	8.0	14.0	7.0	9.0	8.58
7	7.4	10.5	7.0	8.0	8.0	7.0	8.0	8.0	8.0	6.5	7.84
8	8.5	12.0	7.0	9.6	8.5	8.0	7.0	9.0	15.0	8.0	9.26
9	9.6	8.0	11.0	11.0	9.0	9.5	9.0	5.0	10.0	6.5	8.86
10	9.0	10.0	9.0	10.0	10.5	10.5	10.0	8.0	7.5	8.0	9.25
									Rata-rata		8.69

$\bar{\bar{x}}$ = 8.69

σ = 1.51

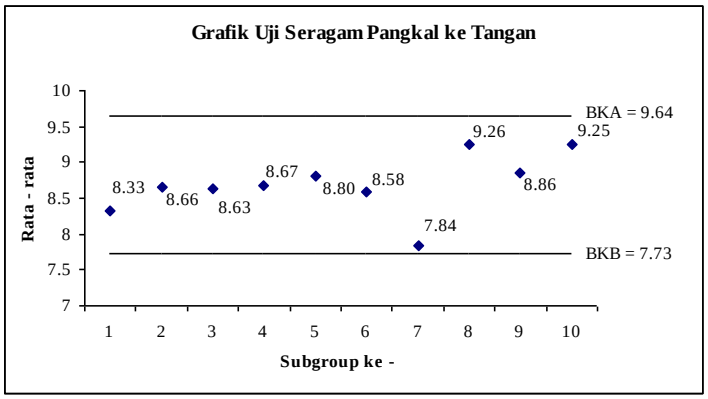
$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{1.51}{\sqrt{10}} = 0.48$$

$$BKB = \bar{\bar{x}} - c(\sigma_x)$$

$$= 8.69 - 2(0.48) = 7.73$$

$$BKA = \bar{\bar{x}} + c(\sigma_x)$$

$$= 8.69 + 2(0.48) = 9.64$$



Berdasarkan grafik di atas, dapat disimpulkan bahwa data seragam karena berada dalam batas BKA dan BKB.

- <u>Uji Cukup</u>

  $\sum Xi^2 = 9^2 + 8^2 + ... + 8^2 = 7774.42$

  $(\sum Xi)^2 = (9+ 8 + ... + 9)^2 = (868.80)^2 = 754813.44$

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

  $$= \left[\frac{2/0.1 \sqrt{100(7774.42) - 754813.44}}{868.80} \right]^2 = 11.99$$

  N = 100

  N’ < N → data yang diperoleh sudah cukup

13. Lebar Jari

- Uji Normal
  - k = 3.3 log n + 1
    = 3.3 log 100 + 1 = 7.6 ≈ 8 kelas
  - c = (Xmax – Xmin) / k
    = (11 – 5.5) / 7.6 = 0.724 ≈ 0.7

Batas Kelas	oi	Z1	Z2	P(Z1)	P (Z2)	P(Z2) - P(Z1)	ei	ei gab	oi gab	χ^2
< 5.45	0	- ∞	-1.970	0	0.024	0.024	2.439	8.919	9	0.001
5.45 - 6.15	9	-1.970	-1.346	0.024	0.089	0.065	6.479			
6.15 - 6.85	8	-1.346	-0.721	0.089	0.235	0.146	14.624	14.624	8	3.001
6.85 - 7.55	28	-0.721	-0.096	0.235	0.462	0.226	22.618	22.618	28	1.281
7.55 - 8.25	25	-0.096	0.528	0.462	0.701	0.240	23.975	23.975	25	0.044
8.25 - 8.95	15	0.528	1.153	0.701	0.876	0.174	17.419	17.419	15	0.336
8.95 - 9.65	8	1.153	1.778	0.876	0.962	0.087	8.673	12.445	15	0.525
9.65 - 10.35	5	1.778	2.402	0.962	0.992	0.030	2.958			
10.35 - 11.05	2	2.402	3.027	0.992	0.999	0.007	0.691			
> 11.05	0	3.027	∞	0.999	1	0.001	0.123			
	100					1	100	100	100	5.186

Tabel uji normal

v = k – r – 1

v = 6 – 2 – 1 = 3

α = 0.05

$\chi^2_{(v,\alpha)}$ = 7.815

χ^2 hasil perhitungan = 5.186

χ^2 hasil perhitungan < $\chi^2_{(v,\alpha)}$ → sehingga mengikuti distribusi normal

- Uji Seragam

Subgroup	1	2	3	4	5	6	7	8	9	10	rata - rata
1	8.0	8.5	7.5	7.0	9.0	8.0	9.0	7.0	6.0	8.5	7.85
2	7.5	8.5	7.5	10.0	9.0	7.5	7.2	8.0	8.0	9.5	8.27
3	6.0	7.0	7.5	6.0	8.0	7.5	8.6	6.2	8.0	9.5	7.43
4	5.5	8.0	6.0	7.0	8.5	10.0	6.0	8.5	7.0	11.0	7.75
5	6.0	7.0	7.5	7.0	9.0	8.0	7.0	8.0	6.5	7.0	7.30
6	7.0	7.0	6.5	7.0	7.7	7.5	8.5	10.0	7.5	7.5	7.62
7	8.5	7.0	7.0	10.5	9.2	7.5	9.0	9.0	8.0	8.0	8.37
8	7.5	6.5	6.5	9.8	7.2	6.0	7.5	7.5	7.0	7.0	7.25
9	8.0	7.0	8.0	7.5	7.8	6.5	7.0	7.0	8.0	6.5	7.33
10	7.0	6.0	7.0	7.5	9.0	7.0	7.0	6.5	10.0	7.1	7.41
									Rata-rata		7.66

$\bar{\bar{x}} = 7.658$

$\sigma = 1.12$

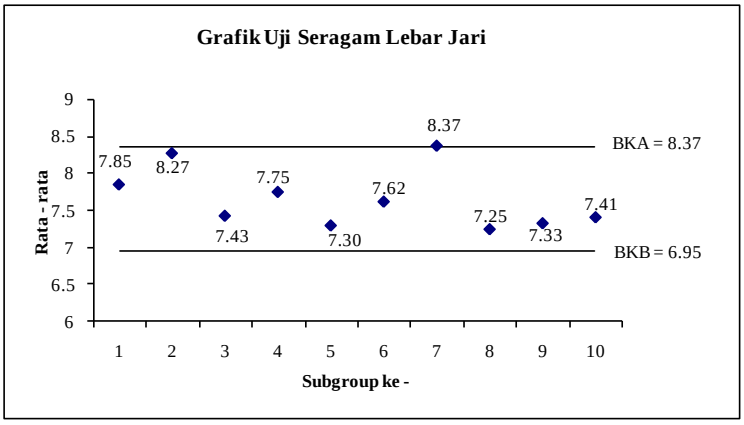
$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{1.12}{\sqrt{10}} = 0.35$$

$$BKB = \bar{\bar{x}} - c(\sigma_x)$$

$= 7.658 - 2(0.35) = 6.95$

$$BKA = \bar{\bar{x}} + c(\sigma_x)$$

$= 7.658 + 2(0.35) = 8.37$



Berdasarkan grafik di atas, dapat disimpulkan bahwa data seragam karena berada dalam batas BKA dan BKB.

- Uji Cukup

  $\sum Xi^2 = 8^2 + 7.5^2 + ... + 7.1^2 = 7774.42$

  $(\sum Xi)^2 = (8+ 7.5 + ... + 7.1)^2 = (868.80)^2 = 754813.44$

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

$$= \left[\frac{2/0.1\sqrt{100(7774.42) - 754813.44}}{868.80} \right]^2 = 11.99$$

N = 100

N' < N → data yang diperoleh sudah cukup

14. Tebal Dada

- Uji Normal
  - k = 3.3 log n + 1

    = 3.3 log 100 + 1 = 7.6 ≈ 8 kelas
  - c = (Xmax – Xmin) / k

    = (32 – 13) / 7.6 = 2.5

Batas Kelas	oi	Z1	Z2	P(Z1)	P (Z2)	P(Z2) - P(Z1)	ei	ei gab	oi gab	χ^2
< 12.95	0	- ∞	-2.218	0	0.013	0.013	1.329	6.846	9	0.678
12.95 - 15.45	7	-2.218	-1.487	0.013	0.068	0.055	5.517			
15.45 - 17.95	11	-1.487	-0.757	0.068	0.224	0.156	15.603	15.603	8	3.704
17.95 - 20.45	31	-0.757	-0.027	0.224	0.489	0.265	26.478	26.478	28	0.087
20.45 - 22.95	27	-0.027	0.703	0.489	0.759	0.270	26.980	26.980	25	0.145
22.95 - 25.45	17	0.703	1.434	0.759	0.924	0.165	16.508	16.508	15	0.138
25.45 - 27.95	4	1.434	2.164	0.924	0.985	0.061	6.061	7.585	15	7.248
27.95 - 30.45	2	2.164	2.894	0.985	0.998	0.013	1.334			
30.45 - 32.95	1	2.894	3.624	0.998	1.000	0.002	0.176			
> 32.95	0	3.624	∞	1.000	1	0.000	0.014			
	100					1	100	100	100	12.00

Tabel uji normal

$v = k - r - 1$

$v = 6 - 2 - 1 = 3$

$\alpha = 0.05$

$\chi^2_{(v,\alpha)} = 7.815$

χ^2 hasil perhitungan = 12

χ^2 hasil perhitungan < $\chi^2_{(v,\alpha)}$ → sehingga mengikuti distribusi normal

- Uji Seragam

Subgroup	1	2	3	4	5	6	7	8	9	10	rata - rata
1	23.0	18.3	26.0	23.0	13.0	15.0	17.2	19.0	23.0	23.0	20.37
2	18.6	15.8	21.0	25.0	20.0	17.0	23.4	21.8	23.0	22.0	20.47
3	21.0	19.0	15.0	18.0	13.0	22.0	18.0	17.1	24.0	19.0	18.61
4	22.0	25.0	18.0	20.0	19.0	18.0	19.0	22.0	28.0	21.0	21.20
5	19.5	22.0	21.0	17.0	24.5	22.0	17.0	17.5	27.0	19.9	20.74
6	20.0	24.0	23.0	16.0	22.0	20.2	19.5	19.0	17.0	27.1	20.84
7	22.0	18.6	28.0	23.0	21.5	22.3	18.6	20.0	19.0	22.8	21.50
8	18.8	21.2	19.0	20.4	18.3	21.5	23.5	24.0	26.0	22.7	21.54
9	19.6	17.5	14.1	22.2	21.3	32.0	15.0	22.5	23.0	18.0	20.52
10	21.1	16.4	21.1	20.2	18.0	22.0	14.0	22.0	20.5	23.0	19.83
									Rata-rata		20.56

$\bar{\bar{x}} = 20.54$

$\sigma = 3.42$

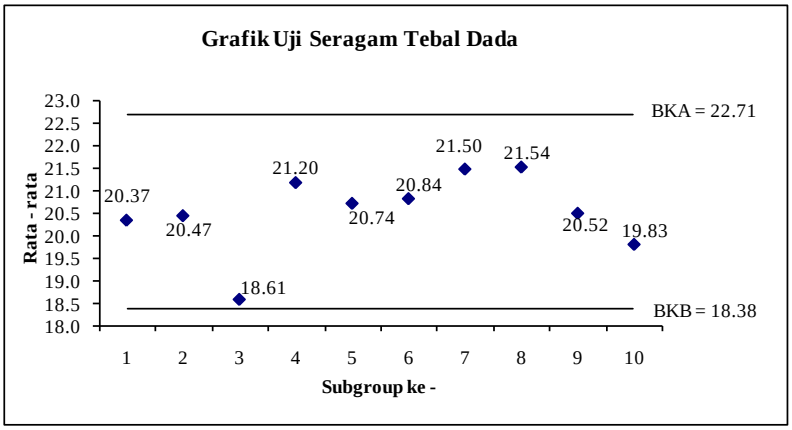
$$\sigma_{\bar{\bar{x}}} = \frac{\sigma}{\sqrt{n}} = \frac{3.42}{\sqrt{10}} = 1.08$$

$$BKB = \bar{\bar{x}} - c(\sigma_x)$$

$= 20.54 - 2(1.08) = 18.38$

$$BKA = \bar{\bar{x}} + c(\sigma_x)$$

$= 20.54 + 2(1.08) = 22.71$



Berdasarkan grafik di atas, dapat disimpulkan bahwa data seragam karena berada dalam batas BKA dan BKB.

- Uji Cukup

$\sum Xi^2 = 23^2 + 18.6^2 + ... + 23^2 = 43400.69$

$(\sum Xi)^2 = (23+ 18.6 + ... + 23)^2 = (1951.5)^2 = 3808352.25$

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

$$= \left[\frac{2/0.1\sqrt{100(43400.69) - 3808352.25}}{1951.5} \right]^2 = 55.85$$

N = 100

N’ < N → data yang diperoleh sudah cukup

15. Panjang Jari Tengah

- Uji Normal
  - k = 3.3 log n + 1
    = 3.3 log 100 + 1 = 7.6 ≈ 8 kelas
  - c = (Xmax – Xmin) / k
    = (13 – 7) / 7.6 = 0.8

Batas Kelas	oi	Z1	Z2	P(Z1)	P (Z2)	P(Z2) - P(Z1)	ei	ei gab	oi gab	χ^2
< 6.95	0	- ∞	-2.413	0	0.008	0.008	0.791			
6.95 - 7.75	4	-2.413	-1.692	0.008	0.045	0.037	3.743	16.584	21	1.176
7.75 - 8.55	17	-1.692	-0.971	0.045	0.166	0.120	12.050			
8.55 - 9.35	19	-0.971	-0.250	0.166	0.401	0.236	23.558	23.558	19	0.882
9.35 - 10.15	30	-0.250	0.471	0.401	0.681	0.280	27.990	27.990	30	0.144
10.15 - 10.95	16	0.471	1.192	0.681	0.883	0.202	20.214	20.214	16	0.878
10.95 - 11.75	11	1.192	1.914	0.883	0.972	0.089	8.870			
11.75 - 12.55	2	1.914	2.635	0.972	0.996	0.024	2.363	11.654	14	0.472
12.55 - 13.35	1	2.635	3.356	0.996	1.000	0.004	0.382			
> 13.35	0	3.356	∞	1.000	1	0.000	0.040			
	100					1	100	100	100	3.553

Tabel uji normal

$v = k - r - 1$

$v = 5 - 2 - 1 = 2$

$\alpha = 0.05$

$\chi^2_{(v,\alpha)} = 5.991$

χ^2 hasil perhitungan = 3.553

χ^2 hasil perhitungan < $\chi^2_{(v,\alpha)}$ → sehingga mengikuti distribusi normal

- Uji Seragam

Subgroup	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**rata - rata**
1	7.5	10.0	10.4	8.4	10.0	9.4	9.5	9.0	11.1	11.0	9.63
2	9.0	9.8	8.0	11.0	9.7	10.2	9.1	10.5	9.0	10.5	9.68
3	8.0	11.7	8.5	10.5	9.3	9.0	9.4	12.0	10.0	10.5	9.89
4	7.0	11.5	10.0	12.0	8.4	9.0	11.0	9.1	10.0	10.5	9.85
5	10.0	10.4	7.5	10.5	8.3	9.5	9.5	10.0	9.9	10.8	9.64
6	10.0	9.5	8.5	9.9	10.2	9.0	9.0	8.0	8.2	11.0	9.33
7	8.0	9.5	8.5	9.6	8.8	9.0	8.5	7.5	9.9	11.2	9.05
8	9.0	8.5	10.0	8.6	8.5	13.0	9.0	8.5	11.3	10.0	9.64
9	10.0	9.0	8.0	10.0	10.5	11.0	9.5	10.2	10.5	11.2	9.99
10	9.5	10.4	10.0	8.9	10.1	9.0	8.5	10.3	9.0	10.0	9.57
									Rata-rata		9.63

$\bar{\bar{x}} = 9.63$

$\sigma = 1.11$

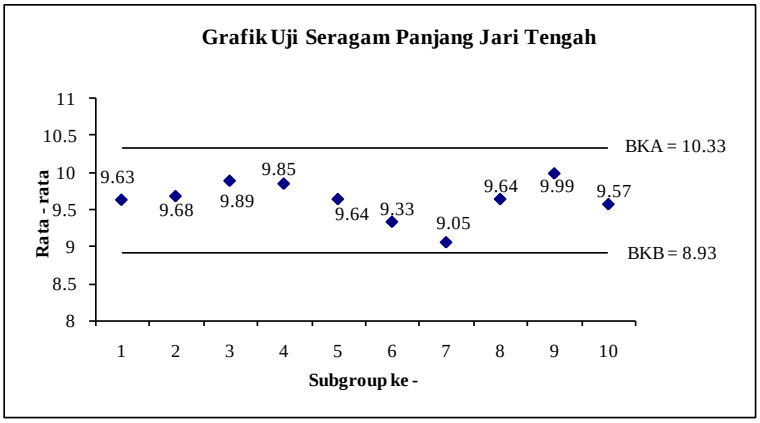
$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{1.11}{\sqrt{10}} = 0.35$$

$$BKB = \bar{\bar{x}} - c(\sigma_x)$$

$$= 9.63 - 2(0.35) = 8.93$$

$$BKA = \bar{\bar{x}} + c(\sigma_x)$$

$$= 9.63 + 2(0.35) = 10.33$$



Berdasarkan grafik di atas, dapat disimpulkan bahwa data seragam karena berada dalam batas BKA dan BKB.

- Uji Cukup

$\sum Xi^2 = 7.5^2 + 9^2 + ... + 10^2 = 9389.77$

$(\sum Xi)^2 = (7.5 + 9 + ... + 10)^2 = (962.7)^2 = 926791.29$

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

$$= \left[\frac{2/0.1 \sqrt{100(9389.77) - 926791.29}}{962.7} \right]^2 = 5.26$$

N = 100

N’ < N → data yang diperoleh sudah cukup

LAMPIRAN 6

TABEL Z

LAMPIRAN 7

ALAT PERTOLONGAN PERTAMA PADA KECELAKAAN

ALAT PERTOLONGAN PERTAMA PADA KECELAKAAN

TABEL JUMLAH PETUGAS P3K BERDASARKAN JUMLAH PEKERJA

KATEGORI RESIKO	JUMLAH NAKER	PETUGAS P3K
Resiko Rendah Toko, kantor/office, perpustakaan	• < 50 pekerja • diantara 50 dan 200 pekerja • > 200 pekerja	Orang yang ditunjuk paling sedikit 1 (satu) orang. Paling tidak 1 (satu) orang untuk 200 pekerja.
Resiko Menengah Teknik ringan, Gudang/warehouse, Proses Makanan	• < 20 pekerja • diantara 20 dan 100 orang pekerja • > 100 pekerja	Orang yang ditunjuk paling sedikit 1 (satu) orang. Sedikitnya 1 (satu) orang untuk 100 pekerja
Resiko Tinggi Industri berat, industri kimia, slaughter houses	• < 5 pekerja • diantara 5 dan 50 pekerja • > 50 pekerja	Orang yang ditunjuk paling sedikit 1 (satu) orang. Sedikitnya 1 (satu) orang untuk 50 pekerja. Sedikitnya 1 (satu) orang petugas P3K telah dilatih untuk kondisi darurat.

Sumber: HSE (First Aid) ISBN 0-7176-0426-8

Jumlah Naker	Tempat Kerja Dg Sedikit Kemungkinan Terjadi Kecelakaan	Tempat Kerja Dg Ada Kemungkinan Terjadi Kecelakaan	Tempat Kerja Dg Banyak Kemungkinan Terjadi Kecelakaan
0 s/d 25	Kotak P3K Bentuk I	Kotak P3K Bentuk I&II	Kotak P3K Bentuk II
25 s/d 100	I	II	III
100 s/d 500	II	III	III + Kotak Dokter
> 500	II Setiap 500 naker	III + Kotak Dokter Setiap 500 naker Kotak Dokter	III Setiap 500 naker + Kotak Dokter

Daftar Isi Kotak P3K menurut bentuknya masing-masing:

a. Kotak Bentuk I berisi:

• 10 gram kapas putih • 1 rol pembalut gulung lebar 2.5 cm • 1 rol pembalut gulung lebar 5 cm • 1 pembalut segitiga (mitella) • 1 pembalut cepat steril/snelverband • 10 buah kassa steril ukuran 5x5 cm • 1 rol plester lebar 2.5 cm	• 10 buah plester cepat (mis. Tensoplast, dll.) • 1 buah gunting • 1 buku catatan • 1 buku pedoman P3K • 1 daftar isi kotak P3K

Obat-obatan untuk Kotak P3K Bentuk I

• Obat pelawan rasa sakit (mis. Antalgin, Acetosai, dll) • Obat sakit perut (mis. Paverin, enterovioform, dll) • Norit • Obat anti alergi	• Obat merah • Soda Kue • Obat tetes mata • Obat gosok

b. Kotak Bentuk II berisi:

• 50 gram kapas putih • 100 gram kapas gemuk • 3 rol pembalut gulung lebar 2.5 cm • 2 rol pembalut gulung lebar 5 cm • 2 rol pembalut gulung lebar 7.5 cm • 2 pembalut segitiga (mitella) • 2 pembalut cepat steril/snelverband • 10 buah kassa steril ukuran 5x5 cm • 10 buah kassa steril ukuran 7.5x7.5 cm • 1 rol plester lebar 1 cm • 20 buah plester lebar 1 cm • 20 buah plester cepat (mis. Tensoplast)	• 1 buah bidal • 1 buah gunting pembalut • 1 buah sabun • 1 dos kertas pembersih (*cleansing tissue* • 1 pinset • 1 lampu senter • 1 buku catatan • 1 buku pedoman P3K • 1 daftar isi kotak P3K

Obat-obatan untuk Kotak P3K Bentuk II

• Obat pelawan rasa sakit (mis. Antalgin, Acetosai, dll) • Obat sakit perut (mis. Paverin, enterovioform, dll) • Norit • Obat anti alergi • Soda Kue, garam dapur • Merculochrom • Obat tetes mata	• Obat gosok • Salep anti histamimka • Salep sulfa atau S.A. powder • Boor zalif • Sofratulle • Larutan rivanol 1/10 500 cc • Amoniak cair 25% 100 cc

c. Kotak Bentuk III berisi:

• 300 gram kapas putih • 300 gram kapas gemuk • 6 rol pembalut gulung lebar 2.5 cm • 8 rol pembalut gulung lebar 5 cm • 2 rol pembalut gulung lebar 10 cm • 4 pembalut segitiga (mitella) • 2 pembalut cepat steril/snelverband • 20 buah kassa steril ukuran 5x5 cm • 40 buah kassa steril ukuran 7.5x7.5 cm • 1 rol plester lebar 1 cm • 20 buah plester cepat (mis. Tensoplast)	• 1 rol plester lebar 2.5 cm • 3 bidal • 1 gunting pembalut • 1 buah sabun • 2 dos kertas pembersih (*cleansing tissue* • 1 pinset • 1 lampu senter • 1 buku catatan • 1 buku pedoman P3K • 1 daftar isi kotak P3K

Obat-obatan untuk Kotak P3K Bentuk III sama dengan obat-obatan untuk Kotak P3K Bentuk II

d. Kotak Khusus Dokter berisi:

● 1 set alat-alat minor surgery lengkap ● 1 botol Alcohol 70% isi 100cc ● 1 botol Aquadest isi 100 cc ● 1 botol Betadine solution 60 cc ● 1 botol Lysol isi 100 cc ● 5 spnit injection diskosable 2 ½ cc ● 5 spnit injection diskosable 5 cc ● 20 lidi kapas ● 2 flakon ATS injection isi 100 cc (disimpan ditempat sejuk) ● 5 flakon P.S. 4:½ atau 4:1 atau PP injectie ● Ampul morphine injectie ● 2 flakon antihistamine injectie	● 2 flakon anti panas injectie ● 5 ampul adrenaline injectie ● 1 flakon cartison injectie ● 2 ampul cardizol injectie ● 2 ampul aminophyline injectie ● 10 sulfas atropine injectie 0.25 g ● 10 sulfas atropine injectie 0.5 g ● 5 ampul anti spascodik injectie ● 2 handuk ● 1 tempat cuci tangan ● 1 mangkok bengkok ● 1 buku catatan ● 1 buku pedoman P3K ● 1 daftar isi

Sumber: SNI-19-3994-1995

LAMPIRAN 8

TABEL *CHI-SQUARE*

KOMENTAR DOSEN PENGUJI

Nama Mahasiswa : Lydia Angelina

NRP : 0623067

Judul Tugas Akhir : "Perancangan Ulang Fasilitas Fisik dan Tata Letak Ruang Visual di Laboratorium APK&E Teknik Industri UKM Ditinjau dari Segi Ergonomi"

Komentar-komentar dosen penguji :

1. Perbaiki kalimat halaman 5-49.
2. Pada pembatasan masalah tambahkan fasilitas fisik apa saja yang dirancang.

DATA PENULIS

Nama	:	Lydia Angelina
Tempat Tanggal Lahir	:	Jakarta, 22 Desember 1987
Alamat di Bandung	:	Jl. Babakan Jeruk Indah 2 no. 2
Alamat Asal	:	Jl. Anggrek Bulan 1 blok F2 no. 3 Taman Galaxi Indah. Bekasi Selatan - 17147
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Pendidikan	:	TK Penabur, Jakarta TK Regina Frobel, Bekasi SD Maria Fransiska, Bekasi SMP Pax Ecclesia, Bekasi SMU Marsudirini, Bekasi Jurusan Teknik Industri - Universitas Kristen Maranatha, Bandung
Nilai Tugas Akhir	:	A
Tanggal USTA	:	5 Februari 2010