

## Data Antropometri

No.	PKL	TPT	JAL	JPTD	No.	PKL	TPT	JAL	JPTD	No.	PKL	TPT	JAL	JPTD	No.	PKL	TPT	JAL	JPTD
1	48.0	15.0	32.8	32.0	26	65.5	23.0	44.5	52.0	51	57.0	17.0	36.0	47.0	76	61.0	10.5	41.7	50.8
2	49.0	11.7	31.2	32.5	27	65.5	19.5	42.9	52.0	52	56.0	16.0	37.5	46.5	77	56.0	16.0	38.6	43.6
3	49.0	14.5	33.4	31.0	28	61.0	13.4	38.6	49.0	53	49.0	14.7	32.0	46.0	78	54.0	12.5	33.5	44.0
4	62.0	11.0	36.4	52.0	29	66.0	20.5	40.6	51.0	54	49.0	17.0	32.5	38.0	79	58.0	12.0	34.7	46.0
5	56.5	18.0	36.2	50.0	30	61.0	12.0	37.5	50.0	55	49.5	15.0	31.0	39.2	80	54.7	16.5	35.0	42.5
6	56.0	11.0	38.4	43.4	31	61.0	11.0	36.1	52.0	56	59.0	15.0	37.0	48.5	81	58.0	16.8	34.3	47.3
7	56.0	13.0	35.0	47.0	32	56.0	10.0	33.8	45.6	57	59.0	14.0	39.0	47.0	82	63.0	15.5	38.0	49.8
8	58.0	20.0	34.1	49.0	33	64.5	15.0	42.0	49.5	58	55.4	16.5	46.0	43.6	83	66.0	21.0	44.8	55.0
9	51.7	15.0	30.7	42.8	34	52.0	14.5	35.0	43.5	59	53.0	14.5	39.0	43.0	84	58.0	12.0	35.7	46.5
10	60.0	13.6	38.0	50.6	35	57.0	13.2	36.0	46.5	60	58.0	16.0	39.0	46.5	85	63.5	11.0	42.0	50.5
11	57.5	15.0	34.8	46.2	36	51.0	14.5	33.6	34.0	61	61.0	17.0	37.0	50.2	86	60.5	19.3	39.5	48.7
12	62.5	19.0	40.0	47.0	37	52.0	14.0	34.5	44.1	62	61.0	19.0	44.0	49.7	87	54.0	13.9	36.2	42.0
13	59.6	15.9	39.4	48.1	38	58.0	16.0	40.8	48.0	63	59.0	18.0	40.4	48.0	88	61.0	12.5	38.9	50.0
14	59.2	18.5	42.0	46.0	39	62.0	23.5	40.0	48.0	64	57.0	20.0	37.0	46.0	89	63.0	15.0	34.5	51.2
15	58.0	16.5	36.0	47.0	40	58.0	14.7	36.7	47.1	65	57.0	12.0	36.8	47.5	90	54.0	16.0	36.0	45.1
16	48.0	14.5	29.4	38.0	41	60.0	15.0	42.2	50.6	66	68.0	20.0	36.3	56.7	91	62.0	13.0	40.0	53.9
17	48.0	11.5	32.9	43.0	42	60.0	13.0	39.0	48.0	67	64.0	13.0	40.1	52.2	92	63.0	20.0	37.3	52.6
18	48.0	14.5	30.4	37.1	43	59.0	13.0	37.3	46.3	68	60.0	19.5	41.7	49.0	93	53.0	18.0	34.0	44.0
19	55.0	20.0	37.5	47.0	44	46.7	16.9	27.6	38.0	69	57.0	21.2	38.5	48.0	94	56.5	14.0	37.0	44.9
20	52.0	12.0	34.0	44.0	45	50.1	16.1	31.7	42.9	70	47.0	16.5	36.0	41.5	95	59.5	17.8	36.5	49.5
21	52.0	16.0	34.5	42.8	46	55.5	15.8	33.4	44.3	71	63.0	19.5	39.0	52.0	96	56.0	18.7	38.0	45.3
22	57.5	15.0	37.7	43.6	47	46.5	16.5	28.5	29.1	72	62.0	14.0	37.0	53.2	97	48.3	15.3	30.0	39.7
23	59.0	13.5	39.1	49.0	48	61.0	16.0	41.4	49.5	73	63.0	18.0	41.0	52.8	98	59.6	12.9	35.4	49.2
24	60.0	14.3	43.2	49.0	49	56.0	15.0	37.0	46.1	74	57.0	15.5	37.0	47.2	99	63.7	19.5	43.0	54.5
25	71.0	14.0	48.4	52.1	50	56.0	20.0	35.0	48.3	75	58.0	21.0	32.0	48.0	100	62.0	14.5	38.0	51.8

## Pengujian Kenormalan Data, Keseragaman Data, dan Kecukupan Data

### Pantat Ke Lutut (PKL)

- Jumlah kelas ( k )

$$k = 1 + 3,3 \log n$$

$$= 1 + 3,3 \log 100$$

$$= 7,6 \approx 8$$

- Lebar kelas ( c )

$$C = \frac{\text{data.max} - \text{data.min}}{k}$$

$$C = \frac{71 - 34}{7,6} = 3,224$$

- Uji Goodness of Fit

Interval kelas	Batas kelas	Z1	Z2	PZ1	PZ2	PZ2-PZ1	oi	ei	oi gab	ei gab	$\frac{(\text{oi gab} - \text{ei gab})^2}{\text{ei gab}}$
< 34	< 46,4995		-2.10947	0	0.017452	0.0174519	0	1.74519	12	6.94653	3.676305301
46.5 - 49.72	46.4995 - 49.7235	-2.1095	-1.47979	0.017452	0.069465	0.0520134	12	5.201339			
49.72 - 52.95	49.7235 - 52.9475	-1.4798	-0.8501	0.069465	0.197635	0.1281701	9	12.81701	9	12.817	1.13673676
52.95 - 56.17	52.9475 - 56.1715	-0.8501	-0.22041	0.197635	0.412776	0.2151405	16	21.51405	16	21.514	1.413249454
56.17 - 59.4	56.1715 - 59.3955	-0.2204	0.409277	0.412776	0.658832	0.2460561	24	24.60561	24	24.6056	0.014905499
59.4 - 62.62	59.3955 - 62.6195	0.40928	1.038965	0.658832	0.850589	0.1917575	22	19.17575	22	19.1758	0.415961406
62.62 - 65.84	62.6195 - 65.8435	1.03896	1.668652	0.850589	0.952407	0.1018174	10	10.18174			
65.84 - 69.07	65.8435 - 69.0675	1.66865	2.29834	0.952407	0.989229	0.0368219	3	3.682192			
69.07 - 72.05	69.0675 - 72.0475	2.29834	2.880371	0.989229	0.998014	0.0087852	4	0.878519	17	14.9411	0.283732132
> 72.06	> 72.0475	2.88037		0.998014	1	0.001986	0	0.198604			
							100				6.940890551

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

$$\left. \begin{array}{l} V = k - r - 1 = 6 - 2 - 1 = 3 \\ \alpha = 0,05 \end{array} \right\} \chi^2_{(\alpha,v)} = 7.814$$

Karena  $\chi^2 > \chi^2_{(\alpha,v)}$ , maka data normal pada tingkat kepercayaan 95 %.

- Uji Keseragaman Data

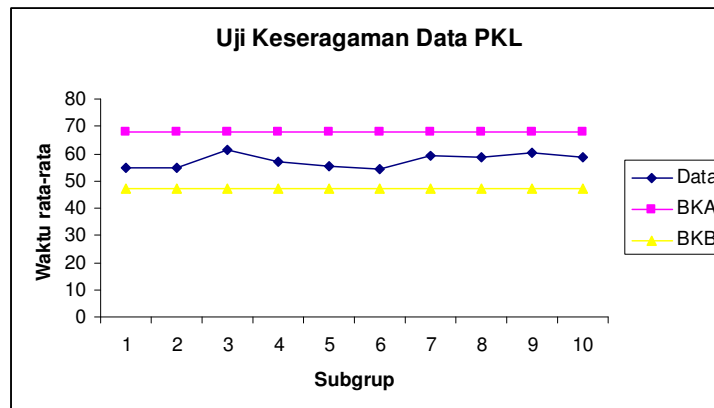
Sub Grup	1	2	3	4	5	6	7	8	9	10	Waktu Rata-Rata
1	48	49	49	62	56.5	56	56	58	51.7	60	54.62
2	57.5	62.5	59.6	59.2	58	48	48	48	55	52	54.78
3	52	57.5	59	60	71	65.5	65.5	61	66	61	61.42857
4	61	56	64.5	52	57	51	52	58	62	58	57.15
5	60	60	59	46.7	50.1	55.5	46.5	61	56	56	55.08
6	57	56	49	49	49.5	59	59	55.4	53	58	54.49
7	61	61	59	57	57	68	64	60	57	47	59.1
8	63	62	63	57	58	61	56	54	58	54.7	58.67
9	58	63	66	58	63.5	60.5	54	61	63	54	60.1
10	62	63	53	56.5	59.5	56	48.3	59.6	63.7	62	58.36
											57.37786

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

$$BKB = 57.37786 - 2(5.165) = 47.05$$

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

$$BKA = 57.37786 + 2(5.165) = 67.71$$



Kesimpulan : Data seragam.

- Uji Kecukupan Data

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

$$N' = \left[ \frac{\left( \frac{2}{0,1} \right) \sqrt{100 * 332400.1 - 30841362.25}}{5553.5} \right]^2$$

$$N' = 31.109 \approx 32$$

Karena  $N' < N \longrightarrow$  data cukup

**Tebal Pantat (TPT)**

- Jumlah kelas ( k )

$$k = 1 + 3,3 \log n$$

$$= 1 + 3,3 \log 100$$

$$= 7,6 \approx 8$$

- Lebar kelas ( c )

$$C = \frac{\text{data. max} - \text{data. min}}{k}$$

$$C = \frac{23.5 - 10.5}{7,6} = 1.382$$

- Uji Goodness of Fit

Interval kelas	Batas kelas	Z1	Z2	PZ1	PZ2	PZ2-PZ1	oi	ei	oi gab	ei gab	$\frac{(oi\ gab - ei\ gab)^2}{ei\ gab}$
< 10.5	< 10.4995		-1.75724	0	0.039439	0.0394386	0	3.943863			
10.5 - 11.88	10.4995 - 11.8815	-1.7572	-1.29734	0.039439	0.097257	0.0578189	7	5.781887	7	9.72575	0.763921717
11.88 - 13.26	11.8815 - 13.2635	-1.2973	-0.83744	0.097257	0.201173	0.1039158	14	10.39158	14	10.3916	1.253002633
13.26 - 14.65	13.2635 - 14.6455	-0.8374	-0.37754	0.201173	0.352887	0.1517138	12	15.17138	12	15.1714	0.662936037
14.65 - 16.03	14.6455 - 16.0275	-0.3775	0.082363	0.352887	0.532821	0.1799337	24	17.99337	24	17.9934	2.00515795
16.03 - 17.41	16.0275 - 17.4095	0.08236	0.542263	0.532821	0.706181	0.1733604	14	17.33604	14	17.336	0.641967897
17.41 - 18.79	17.4095 - 18.7915	0.54226	1.002163	0.706181	0.841868	0.1356863	7	13.56863	17	13.5686	0.867759858
18.79 - 20.17	18.7915 - 20.1735	1.00216	1.462063	0.841868	0.928138	0.0862705	13	8.627048	13	8.62705	2.216599335
20.17 - 23.15	20.1735 - 23.1535	1.46206	2.453744	0.928138	0.992931	0.0647931	9	6.479306	9	7.18619	0.457807198
>23.16	> 23.1535	2.45374		0.992931	1	0.0070689	0	0.706888			
							100				8.869152625

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

$$\left. \begin{matrix} V = k - r - 1 = 8 - 2 - 1 = 5 \\ \alpha = 0,05 \end{matrix} \right\} \chi^2_{(\alpha,v)} = 11.07$$

Karena  $\chi^2 > \chi^2_{(\alpha,v)}$ , maka data normal pada tingkat kepercayaan 95 %.

- Uji Keseragaman Data

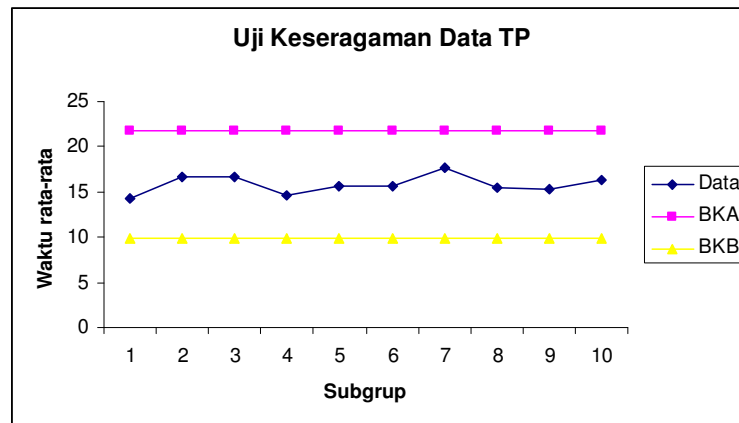
Sub Grup	1	2	3	4	5	6	7	8	9	10	Waktu Rata-Rata
1	15	11.7	14.5	11	18	11	13	20	15	13.6	14.28
2	15	19	15.9	18.5	16.5	14.5	11.5	14.5	20	12	16.7
3	16	15	13.5	14.3	14	23	19.5	13.4	20.5	12	16.5833
4	11	10	15	14.5	13.2	14.5	14	16	23.5	14.7	14.64
5	15	13	13	16.9	16.1	15.8	16.5	16	15	20	15.73
6	17	16	14.7	17	15	15	14	16.5	14.5	16	15.57
7	17	19	18	20	12	20	13	19.5	21.2	16.5	17.62
8	19.5	14	18	15.5	21	10.5	16	12.5	12	16.5	15.55
9	16.8	15.5	21	12	11	19.3	13.9	12.5	15	16	15.3
10	13	20	18	14	17.8	18.7	15.3	12.9	19.5	14.5	16.37
											15.8343

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

$$BKB = 15.8343 - 2(2.944) = 9.946$$

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

$$BKA = 15.8343 + 2(2.944) = 21.72$$



Kesimpulan : Data seragam.

- Uji Kecukupan Data

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

$$N' = \left[ \frac{\left( \frac{2}{0,1} \right) \sqrt{100 * 25477,5 - 2152089}}{1467} \right]^2$$

$$N' = 73,53 \approx 74$$

Karena  $N' < N \longrightarrow$  data cukup

**Jarak Antar Lutut (JAL)**

- Jumlah kelas ( k )

$$k = 1 + 3,3 \log n$$

$$= 1 + 3,3 \log 100$$

$$= 7,6 \approx 8$$

- Lebar kelas ( c )

$$C = \frac{\text{data. max} - \text{data. min}}{k}$$

$$C = \frac{48.4 - 27.6}{7,6} = 2.736$$

- Uji Goodness of Fit

Interval kelas	Batas kelas	Z1	Z2	PZ1	PZ2	PZ2-PZ1	oi	ei	oi gab	ei gab	$\frac{(\text{oi gab} - \text{ei gab})^2}{\text{ei gab}}$
< 27.6	< 27.5995		-2.40329	0	0.008124	0.0081242	0	0.81242			
27.6 - 30.34	27.5995 - 30.3355	-2.4033	-1.70604	0.008124	0.044	0.0358761	4	3.587613	14	15.6537	0.174705178
30.34 - 33.07	30.3355 - 33.0715	-1.706	-1.00879	0.044	0.156537	0.1125368	10	11.25368			
33.07 - 35.81	33.0715 - 35.8075	-1.0088	-0.31154	0.156537	0.377693	0.2211562	20	22.11562	20	22.1156	0.202384593
35.81 - 38.54	35.8075 - 38.5435	-0.3115	0.385703	0.377693	0.650142	0.2724484	32	27.24484	32	27.2448	0.829938866
38.54 - 41.28	38.5435 - 41.2795	0.3857	1.082951	0.650142	0.860585	0.2104431	19	21.04431	19	21.0443	0.198590931
41.28 - 44.02	41.2795 - 44.0155	1.08295	1.780199	0.860585	0.962478	0.1018934	11	10.18934			
44.02 - 46.75	44.0155 - 46.7515	1.7802	2.477446	0.962478	0.993384	0.0309054	3	3.090541			
46.75 - 49.73	46.7515 - 49.7315	2.47745	3.236876	0.993384	0.999396	0.0060121	1	0.601208	15	13.9415	0.080364859
> 49.74	> 49.7315	3.23688		0.999396	1	0.0006042	0	0.060423			
							100				1.485984426

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

$$\alpha = 0,05$$

$$\chi^2_{(\alpha, v)} = 5.99$$

Karena  $\chi^2 > \chi^2_{(\alpha, v)}$ , maka data normal pada tingkat kepercayaan 95 %.



- Uji Keseragaman Data

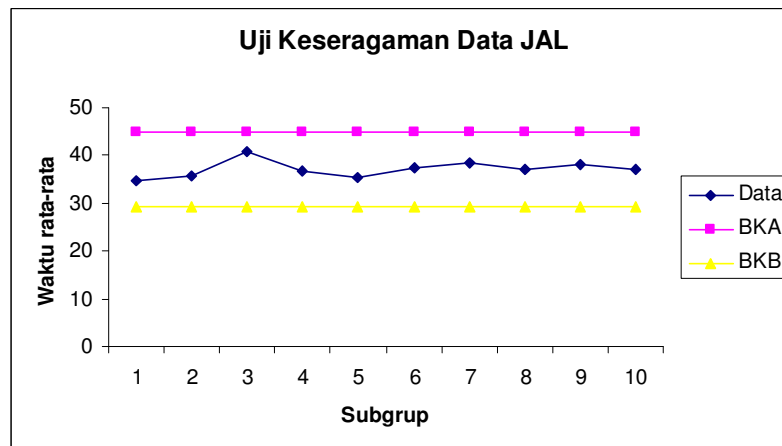
Sub Grup	1	2	3	4	5	6	7	8	9	10	Waktu Rata-Rata
1	32.8	31.2	33.4	36.4	36.2	38.4	35	34.1	30.7	38	34.62
2	34.8	40	39.4	42	36	29.4	32.9	30.4	37.5	34	35.64
3	34.5	37.7	39.1	43.2	48.4	44.5	42.9	38.6	40.6	37.5	40.7
4	36.1	33.8	42	35	36	33.6	34.5	40.8	40	36.7	36.85
5	42.2	39	37.3	27.6	31.7	33.4	28.5	41.4	37	35	35.31
6	36	37.5	32	32.5	31	37	39	46	39	39	37.3889
7	37	44	40.4	37	36.8	36.3	40.1	41.7	38.5	36	38.5333
8	39	37	41	37	32	41.7	38.6	33.5	34.7	35	36.95
9	34.3	38	44.8	35.7	42	39.5	36.2	38.9	34.5	36	37.99
10	40	37.3	34	37	36.5	38	30	35.4	43	38	36.92
											37.0902

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

$$BKB = 37.0902 - 2(3.924) = 44.94$$

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

$$BKA = 37.0902 + 2(3.924) = 29.24$$



Kesimpulan : Data seragam.

- Uji Kecukupan Data

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

$$N' = \left[ \frac{\left( \frac{2}{0,1} \right) \sqrt{100 * 138891 - 12372806,25}}{3517,5} \right]^2$$

$$N' = 49,02 \approx 50$$

Karena  $N' < N \longrightarrow$  data cukup

**Jarak Pantat dengan Ujung Tempat Duduk (JPTD)**

- Jumlah kelas ( k )

$$k = 1 + 3,3 \log n$$

$$= 1 + 3,3 \log 100$$

$$= 7,6 \approx 8$$

- Lebar kelas ( c )

$$C = \frac{\text{data.max} - \text{data.min}}{k}$$

$$C = \frac{56.7 - 29.1}{7,6} = 3.631$$

- Uji Goodness of Fit

Interval kelas	Batas kelas	Z1	Z2	PZ1	PZ2	PZ2-PZ1	oi	ei	oi gab	ei gab	$\frac{(oi\ gab - ei\ gab)^2}{ei\ gab}$
< 29.1	< 29.0995		-3.28874	0	0.000503	0.0005032	0	0.050319			
29.1 - 32.73	29.0995 - 32.7305	-3.2887	-2.59328	0.000503	0.004753	0.0042501	4	0.425012	11	11.4613	0.018565362
32.73 - 36.36	32.7305 - 36.3615	-2.5933	-1.89782	0.004753	0.02886	0.0241068	1	2.410682			
36.36 - 39.99	36.3615 - 39.9925	-1.8978	-1.20236	0.02886	0.114613	0.0857527	6	8.575271			
39.99 - 43.62	39.9925 - 43.6235	-1.2024	-0.5069	0.114613	0.306114	0.1915013	13	19.15013	13	19.1501	1.9751368
43.62 - 47.25	43.6235 - 47.2545	-0.5069	0.188565	0.306114	0.574783	0.2686691	27	26.86691	27	26.8669	0.000659274
47.26 - 50.89	47.2545 - 50.8855	0.18857	0.884026	0.574783	0.811659	0.2368756	32	23.68756	32	23.6876	2.916998048
50.89 - 54.52	50.8855 - 54.5165	0.88403	1.579487	0.811659	0.942888	0.1312288	15	13.12288	15	13.1229	0.268505283
54.52 - 57.5	54.5165 - 57.4965	1.57949	2.150259	0.942888	0.984233	0.0413448	2	4.134485	2	5.71122	2.41159871
> 57.51	> 57.4965	2.15026		0.984233	1	0.0157674	0	1.576738			
							100				7.591463476

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

$$\left. \begin{matrix} V = k - r - 1 = 6 - 2 - 1 = 3 \\ \alpha = 0,05 \end{matrix} \right\} \chi^2_{(\alpha,v)} = 7.814$$

Karena  $\chi^2 > \chi^2_{(\alpha,v)}$ , maka data normal pada tingkat kepercayaan 95 %.

- Uji Keseragaman Data

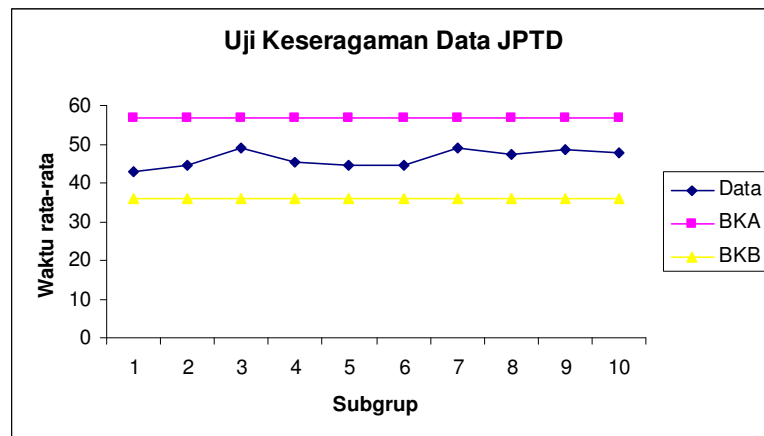
Sub Grup	1	2	3	4	5	6	7	8	9	10	Waktu Rata-Rata
1	32	32.5	31	52	50	43.4	47	49	42.8	50.6	43.03
2	46.2	47	48.1	46	47	38	43	37.1	47	44	44.34
3	42.8	43.6	49	49	52.1	52	52	49	51	50	49.05
4	52	45.6	49.5	43.5	46.5	34	44.1	48	48	47.1	45.42
5	50.6	48	46.3	38	42.9	44.3	29.1	49.5	46.1	48.3	44.31
6	47	46.5	46	38	39.2	48.5	47	43.6	43	46.5	44.53
7	50.2	49.7	48	46	47.5	56.7	52.2	49	48	41.5	48.88
8	52	53.2	52.8	47.2	48	50.8	43.6	44	46	42.5	47.48
9	47.3	49.8	55	46.5	50.5	48.7	42	50	51.2	45.1	48.47
10	53.9	52.6	44	44.9	49.5	45.3	39.7	49.2	54.5	51.8	47.88
											46.34

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

$$BKB = 46.34 - 2(5.221) = 56.78$$

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

$$BKA = 46.34 + 2(5.221) = 35.9$$



Kesimpulan : Data seragam.

- Uji Kecukupan Data

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

$$N' = \left[ \frac{\left( \frac{2}{0,1} \right) \sqrt{100 * 219003.1 - 18519251.6}}{4303.4} \right]^2$$

$$N' = 73.02 \approx 74$$

Karena  $N' < N \longrightarrow$  data cukup