

LATIHAN SOAL

Dari data berikut yang disajikan dalam bentuk Tabel, Histogram, Poligon Frekuensi, Ogive positif dan Ogive negatif, Tentukan :

- a). Rata-rata hitung
- b). Median
- c). Modus
- d) Simpangan Baku

1. Tabel

Nilai	f
51-60	4
61-70	7
71-80	16
81-90	10
91-100	3

Jawab :

Nilai	x	f	U	u ²	fu	fu ²	Fk
51-60	55,5	4	-2	4	-8	16	4
61-70	65,5	7	-1	1	-7	7	11
71-80	75,5	16	0	0	0	0	27
81-90	85,5	10	1	1	10	10	37
91-100	95,5	3	2	4	6	12	40
JUMLAH		40			1	45	

Rata-rata :

$$\bar{x} = X_d + \left(\frac{\sum fu}{\sum f} \right) \cdot c$$

$$\bar{x} = 75 \frac{1}{2} + \left(\frac{1}{40} \right) \cdot 10$$

$$\bar{x} = 75 \frac{2}{4} + \frac{1}{4}$$

$$\bar{x} = 75 \frac{3}{4}$$

Median :

$$Me = L + \left(\frac{\frac{1}{2}N - \sum f_2}{f_2} \right) \cdot c$$

$$Me = 70 \frac{1}{2} + \left(\frac{20 - 11}{16} \right) \cdot 10$$

$$Me = 70 \frac{1}{2} + \left(\frac{90}{16} \right)$$

$$Me = 70 \frac{4}{8} + \left(\frac{45}{8} \right) = 70 \frac{49}{8} = 76 \frac{1}{8}$$

Modus :

$$M_o = L + \left(\frac{d_1}{d_1 + d_2} \right) \cdot c$$

$$M_o = 70 \frac{1}{2} + \left(\frac{9}{9 + 6} \right) \cdot 10$$

$$M_o = 70 \frac{1}{2} + \left(\frac{3}{5} \right) \cdot 10$$

$$M_o = 76 \frac{1}{2}$$

Simpangan Baku :

$$\sigma^2 = c^2 \cdot \left\{ \frac{\sum f \cdot u^2}{N} - \left(\frac{\sum f \cdot u}{N} \right)^2 \right\}$$

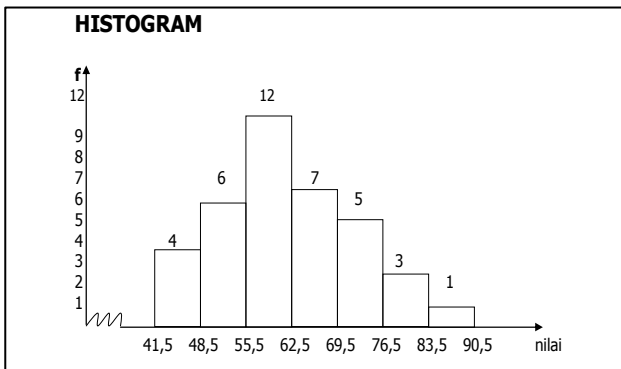
$$\sigma^2 = 100 \cdot \left\{ \frac{45}{40} - \left(\frac{1}{40} \right)^2 \right\}$$

$$\sigma^2 = 100 \cdot \left\{ \frac{40 \cdot 45}{40^2} - \frac{1}{40^2} \right\}$$

$$\sigma^2 = \frac{10^2}{40^2} \cdot (1800 - 1) = \frac{10^2}{40^2} \cdot 1799$$

$$\sigma = \frac{1}{4} \sqrt{1799}$$

2. Histogram



Jawab :

Interval	Nilai	x	f	u	u ²	fu	fu ²	fk
41,5-48,5	42-48	45	4	-2	4	-8	16	4
48,5-55,5	49-55	52	6	-1	1	-6	6	10
55,5-62,5	56-62	59	12	0	0	0	0	22
62,5-69,5	63-69	66	7	1	1	7	7	29
69,5-76,5	70-76	73	5	2	4	10	20	34
76,5-83,5	77-83	80	3	3	9	9	27	37
83,5-90,5	84-90	87	1	4	16	4	16	38
JUMLAH			38			16	92	

Rata-rata :

$$\bar{x} = X_d + \left(\frac{\sum fu}{\sum f} \right) \cdot c$$

$$\bar{x} = 59 + \left(\frac{16}{38} \right) \cdot 7$$

$$\bar{x} = 59 + \left(\frac{8}{19} \right) \cdot 7$$

$$\bar{x} = 59 + \left(\frac{56}{19} \right)$$

$$\bar{x} = 59 + 2 \frac{18}{19} = \mathbf{61 \frac{18}{19}}$$

Median :

$$Me = L + \left(\frac{\frac{1}{2}N - \sum f_2}{f_2} \right) \cdot c$$

$$Me = 55 \frac{1}{2} + \left(\frac{19 - 10}{12} \right) \cdot 7$$

$$Me = 55 \frac{6}{12} + \left(\frac{63}{12} \right)$$

$$Me = 55 \frac{69}{12} = \mathbf{60 \frac{3}{4}}$$

Modus :

$$M_o = L + \left(\frac{d_1}{d_1 + d_2} \right) \cdot c$$

$$M_o = 55 \frac{1}{2} + \left(\frac{6}{6 + 5} \right) \cdot 7$$

$$M_o = 55 \frac{1}{2} + \left(\frac{42}{11} \right)$$

$$M_o = 55 \frac{11}{22} + \left(\frac{84}{22} \right)$$

$$M_o = 55 \frac{95}{22} = \mathbf{59 \frac{7}{22}}$$

Simpangan Baku :

$$\sigma^2 = c^2 \cdot \left\{ \frac{\sum f \cdot u^2}{N} - \left(\frac{\sum f \cdot u}{N} \right)^2 \right\}$$

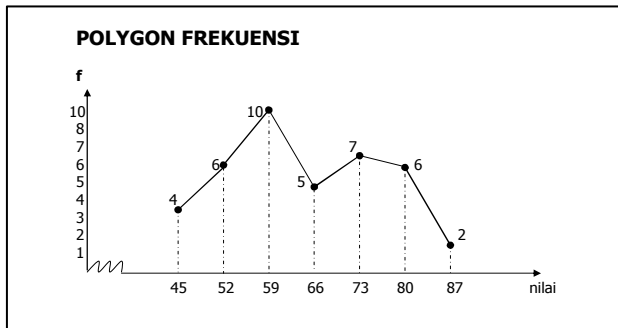
$$\sigma^2 = 49 \cdot \left\{ \frac{92}{38} - \left(\frac{16}{38} \right)^2 \right\}$$

$$\sigma^2 = 49 \cdot \left\{ \frac{38 \cdot 92}{38^2} - \frac{256}{38^2} \right\}$$

$$\sigma^2 = \frac{7^2}{38^2} \cdot (3496 - 256)$$

$$\sigma = \frac{7}{38} \sqrt{\mathbf{3240}}$$

3. Poligon Frekuensi



Jawab :

Nilai	x	f	u	u ²	fu	fu ²	fk
42-48	45	4	-2	4	-8	16	4
49-55	52	6	-1	1	-6	6	10
56-62	59	10	0	0	0	0	20
63-69	66	5	1	1	5	5	25
70-76	73	7	2	4	14	28	32
77-83	80	6	3	9	18	54	38
84-90	87	2	4	16	8	32	40
JUMLAH		40			31	141	

Rata-rata :

$$\bar{x} = X_d + \left(\frac{\sum fu}{\sum f} \right) \cdot c$$

$$\bar{x} = 59 + \left(\frac{31}{40} \right) \cdot 7$$

$$\bar{x} = 59 + \left(\frac{217}{40} \right)$$

$$\bar{x} = 59 + 5 \frac{17}{40}$$

$$\bar{x} = 64 \frac{17}{40}$$

Median :

$$Me = L + \left(\frac{\frac{1}{2}N - \sum f_2}{f_2} \right) \cdot c$$

$$Me = 55 \frac{1}{2} + \left(\frac{20 - 10}{10} \right) \cdot 7$$

$$Me = 55 \frac{1}{2} + \left(\frac{10}{10} \right) \cdot 7$$

$$Me = 62 \frac{1}{2}$$

Modus :

$$M_o = L + \left(\frac{d_1}{d_1 + d_2} \right) \cdot c$$

$$M_o = 55 \frac{1}{2} + \left(\frac{4}{4 + 5} \right) \cdot 7$$

$$M_o = 55 \frac{1}{2} + \left(\frac{28}{9} \right)$$

$$M_o = 55 \frac{18}{36} + 3 \frac{2}{18}$$

$$M_o = 58 \frac{11}{18}$$

Simpangan Baku :

$$\sigma^2 = c^2 \cdot \left\{ \frac{\sum f \cdot u^2}{N} - \left(\frac{\sum f \cdot u}{N} \right)^2 \right\}$$

$$\sigma^2 = 49 \cdot \left\{ \frac{141}{40} - \left(\frac{31}{40} \right)^2 \right\}$$

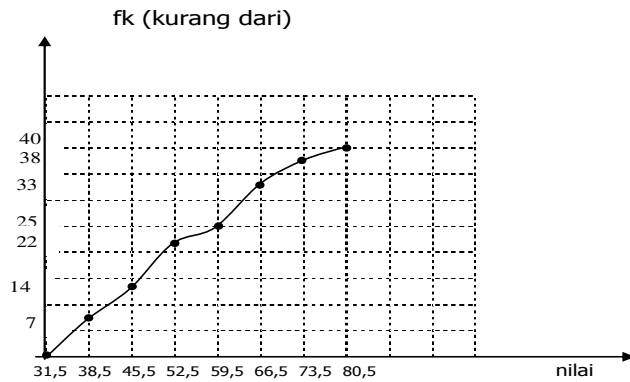
$$\sigma^2 = 49 \cdot \left\{ \frac{40 \cdot 141}{40^2} - \frac{961}{40^2} \right\}$$

$$\sigma^2 = \frac{7^2}{40^2} \cdot (5640 - 961)$$

$$\sigma = \frac{7}{40} \sqrt{4679}$$

4. Ogive positif

KURVA OGIVE POSITIF



Jawab :

Interval	fk <	Nilai	x	f	u	u ²	fu	fu ²	u	u ²	fu	fu ²
31,5-38,5	0	32-38	35	7	-4	16	-28	112	-2	4	-14	28
38,5-45,5	7	39-45	42	7	-3	9	-21	63	-1	1	-7	7
45,5-52,5	14	46-52	49	8	-2	4	-16	32	0	0	0	0
52,5-59,5	22	53-59	56	3	-1	1	-3	3	1	1	3	3
59,5-66,5	25	60-66	63	8	0	0	0	0	2	4	16	32
66,5-73,5	33	67-73	70	5	1	1	5	5	3	9	15	45
73,5-80,5	38	74-80	77	2	2	4	4	8	4	16	8	32
80,5-87,5	40	81-87										
JUMLAH				40			-59	233			21	147

Rata-rata 1 (dengan $X_d = 63$)

$$\bar{x} = X_d + \left(\frac{\sum fu}{\sum f} \right) \cdot c$$

$$\bar{x} = 63 + \left(\frac{-59}{40} \right) \cdot 7$$

$$\bar{x} = 63 + \left(\frac{-413}{40} \right)$$

$$\bar{x} = 63 - 10 \frac{13}{40}$$

$$\bar{x} = 52 \frac{27}{40}$$

Rata-rata 2 (dengan $X_d = 49$)

$$\bar{x} = X_d + \left(\frac{\sum fu}{\sum f} \right) \cdot c$$

$$\bar{x} = 49 + \left(\frac{21}{40} \right) \cdot 7$$

$$\bar{x} = 49 + \left(\frac{147}{40} \right)$$

$$\bar{x} = 49 + 3 \frac{27}{40}$$

$$\bar{x} = 52 \frac{27}{40}$$

Median :

$$Me = L + \left(\frac{\frac{1}{2}N - \sum f_2}{f_2} \right) \cdot c$$

$$Me = 45 \frac{1}{2} + \left(\frac{20 - 14}{8} \right) \cdot 7$$

$$Me = 45 \frac{1}{2} + \left(\frac{6}{8} \right) \cdot 7$$

$$Me = 45 \frac{1}{2} + \left(\frac{42}{8} \right)$$

$$Me = 45 \frac{1}{2} + 5 \frac{1}{4} = 50 \frac{3}{4}$$

Modus 1 (dengan $X_d = 63$)

$$M_o = L + \left(\frac{d_1}{d_1 + d_2} \right) \cdot c$$

$$M_o = 59 \frac{1}{2} + \left(\frac{5}{5 + 3} \right) \cdot 7$$

$$M_o = 59 \frac{1}{2} + \left(\frac{35}{8} \right)$$

$$M_o = 59 \frac{4}{8} + 4 \frac{3}{8}$$

$$M_o = 63 \frac{7}{8}$$

Modus 2 (dengan $X_d = 49$)

$$M_o = L + \left(\frac{d_1}{d_1 + d_2} \right) \cdot c$$

$$M_o = 45 \frac{1}{2} + \left(\frac{1}{1 + 5} \right) \cdot 7$$

$$M_o = 45 \frac{1}{2} + \left(\frac{7}{6} \right)$$

$$M_o = 45 \frac{7}{14} + 1 \frac{2}{14}$$

$$M_o = 46 \frac{9}{14}$$

Simpangan Baku 1 (dengan $X_d = 63$)

$$\sigma^2 = c^2 \cdot \left\{ \frac{\sum f \cdot u^2}{N} - \left(\frac{\sum f \cdot u}{N} \right)^2 \right\}$$

$$\sigma^2 = 49 \cdot \left\{ \frac{233}{40} - \left(\frac{-59}{40} \right)^2 \right\}$$

$$\sigma^2 = 49 \cdot \left\{ \frac{40 \cdot 233}{40^2} - \frac{3481}{40^2} \right\}$$

$$\sigma^2 = \frac{7^2}{40^2} \cdot (9320 - 3481)$$

$$\sigma = \frac{7}{40} \sqrt{5839}$$

Simpangan Baku 2 (dengan $X_d = 49$)

$$\sigma^2 = c^2 \cdot \left\{ \frac{\sum f \cdot u^2}{N} - \left(\frac{\sum f \cdot u}{N} \right)^2 \right\}$$

$$\sigma^2 = 49 \cdot \left\{ \frac{147}{40} - \left(\frac{21}{40} \right)^2 \right\}$$

$$\sigma^2 = 49 \cdot \left\{ \frac{40 \cdot 147}{40^2} - \frac{441}{40^2} \right\}$$

$$\sigma^2 = \frac{7^2}{40^2} \cdot (5880 - 441)$$

$$\sigma = \frac{7}{40} \sqrt{5439}$$