Variance :-

$$s^2 = \sum_{i=1}^{n} \frac{(x_i - \bar{x})^2}{n-1}$$

$x = \{1, 2, 3, 3, 4, 6\}$

x_i	$\bar{x}$	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$
1	3.16	-2.16	4.6656
2	3.16	-1.16	1.3456
3	3.16	-0.16	0.0256
3	3.16	-0.16	0.0256
4	3.16	0.84	0.7056
6	3.16	2.84	8.0656
3.16			14.8333

$$s^2 = \frac{14.8333}{6-1} = \frac{14.8333}{5}$$

$$s^2 = 2.966$$

Mean, Median :

Age	Salary
23	40,000
24	41,000
28.	72,000
27.	NaN.
NAN	18,000
31	24,000
58	10,00,00
NAN.	50,000

$$Age\ \mu = \frac{23 + 24 + 28 + 27 + 31 + 58}{6}$$

$$= \frac{191}{6}$$

$$= 31.83$$

Median : If no. of elements are even we find the
Age — average of central elements.

$$= \frac{27 + 31.8}{2} = 29.4$$

$$Salary\ \mu = \frac{40,000 + 41000 + 72000 + 18,000 + 24,000 + 10,00,00 + 50,000}{7}$$

$$= \frac{345000}{7} = 49285.714$$

$$= 49.285$$

Median of salary = If no. of elements are even we find the average of central elements.

$$= \frac{49285.7 + 18000}{2}$$

$$= \frac{67285.7}{2}$$

$$= 33642$$

<u>five number summary:</u>

<u>Dataset:</u>

1, 2, 2, 2, 3, 3, 4, 4, 5, 5, 6, 7, 8, 9, 10, 11, 11, 12, 13, 14, 68

$Q_1 = 25\% \Rightarrow \frac{\text{percentile}}{100} \times (n+1)$ $\quad n = 21$

$$= \frac{25}{100} \times (21+1)$$

$$= \cancel{\frac{25}{100} \times (22)} \Rightarrow \frac{25}{100} \times (22)$$

$$= 0.25\,(22)$$

$$= 5.5 \text{ index}$$

Avg (5+6) index $= \frac{3+3}{2} = \frac{6}{2} = 3$

$Q_3 (75\%) = \frac{75}{100} (n+1)$

$= \frac{75}{100} \times (21+1)$

$= \frac{75}{100} \times 22$

$= 0.75 \times 22$

$= 16.5$ index

Avg
(16+17) index : $\frac{11+11}{2} = \frac{22}{2} = 11$

$Q_3 - Q_1 = 11 - 3 = 8$

Lower fence $= Q_1 - 1.5(IQR)$

$= 3 - 1.5(8)$

$= 3 - 12$

$= -9$

Higher fence $= Q_3 + 1.5(IQR)$

$= 11 + 1.5(8)$

$= 11 + 12$

$= 23$

$[-9 \longleftrightarrow 23]$

68 is a ~~ot~~ outlier

1. Minimum = 1

2. $Q_1 = 3$

3. Median = 6

4. $Q_3 = 11$

5. Maximum = 14

Box plot.