

## Central Tendencies

i) a) 9, 7, 11, 13, 2, 4, 5, 5

$$\text{Mean} = \frac{9+7+11+13+2+4+5+5}{8}$$

$$= \frac{56}{8} = 7$$

b) 2.2, 10.2, 14.7, 5.9, 4.9, 11.1, 10.5

$$\text{Mean} = \frac{2.2 + 10.2 + 14.7 + 5.9 + 4.9 + 11.1 + 10.5}{7}$$

$$= \frac{59.5}{7} = 8.50$$

c)  $1\frac{1}{4} + 2\frac{1}{2} + 5\frac{1}{2}, 3\frac{1}{4}, 2\frac{1}{2}$

$$\Rightarrow \frac{5}{4}, \frac{5}{2}, \frac{11}{2}, \frac{13}{4}, \frac{5}{2}$$

$$\text{Mean} = \frac{\frac{5}{4} + \frac{5}{2} + \frac{11}{2} + \frac{13}{4} + \frac{5}{2}}{5}$$

$$= \frac{1.25 + 2.5 + 5.5 + 3.25 + 2.5}{5}$$

$$= \frac{15}{5} = 3$$

2) first = 0

second = 1

for i in range(10):

if (i == 0):

fib = first

print(fib)

else (i == 1):

fib = second

print(fib)

else:

fib = first + second

first = second

second = fib

print(fib)

O/P:- 0, 1, 1, 2, 3, 5, 8, 13, 21, 34.

$$\text{Mean} = \frac{0+1+1+2+3+5+8+13+21+34}{10}$$

$$= \frac{88}{10} = 8.8$$

3) first 5 prime numbers - Mean & Median.

2, 3, 5, 7, 11

- P.T.O -

$$\text{Mean} = \frac{2+3+5+7+11}{5}$$

$$= \frac{28}{5} = 5.6$$

Median = for <sup>odd</sup> numbers of elements in the array,  
median is  $\frac{n+1}{2}$  where "n" = no. of elements

$$= \frac{5+1}{2} = \frac{6}{2} = 3$$

$$\therefore \text{Median} = \underline{\underline{5}}$$

4) Array = 8, 11, 6, 14,  $x$ , 13.

$$\text{Mean} = 66.$$

$$\text{Mean} = \frac{\sum x}{n}$$

$$66 = \frac{8+11+6+14+x+13}{6}$$

$$66(6) = 52 + x$$

$$x = 396 - 52$$

$$x = 344$$

$\therefore 6, 8, 11, 13, 14, 344$  is the array &

344 is an outlier.

$$5) \text{ Array} = 6, 8, x+2, 10, 2x-1, 2$$

$$\text{Mean} = 9$$

$$9 = \frac{6 + 8 + (x+2) + 10 + (2x-1) + 2}{6}$$

$$54 = 27 + 3x$$

$$3x = 27$$

$$x = 9$$

Array = 2, 6, 8, 10, 11, 18

$$Q_1 = \frac{6 + 1^{\text{st}}}{4} = 1.75 \approx 2^{\text{nd}}$$

$$\frac{\frac{2}{1} \cdot 1.75 \times 3}{5 \cdot 2.5} \approx 5$$

$$Q_1 = 6$$

$$Q_3 = 5^{\text{th}} \text{ element} = 11$$

$$\frac{8.3 + 3(2\text{QR})}{2}$$

$$\frac{2}{1.5 \times 5} \cdot 7.5$$

$$2\text{QR} = Q_3 - Q_1 = 11 - 6 = 5$$

$$\begin{aligned} &= Q_3 + 1.5(2\text{QR}) \\ &= 11 + 7.5 \\ &= 17.5 \end{aligned}$$

$(x+2) \Rightarrow 11$  is the 3<sup>rd</sup> quartile i.e; it is ~~outlier~~ falls below inner fence.

$(2x-1) \Rightarrow 18$  is the outlier as it lies <sup>suspected</sup> between inner fence & outer fence.

~~$$\text{Profit} := Q_3 + 1.5(2\text{QR})$$~~

$$11 + 1.5(5) = 17.5$$

6) a) Age of 20 Boys -

Age (Yrs)	12	10	15	14	8
No. of boys	5	3	2	6	4

$$\text{Mean} = \frac{\sum(n_i f_i)}{N}$$

$$\text{Mean} = \frac{(12 \times 5) + (10 \times 3) + (15 \times 2) + (14 \times 6) + (8 \times 4)}{20}$$

$$= \frac{60 + 30 + 30 + 84 + 32}{20}$$

$$= \frac{236}{20}$$

$$= 11.80$$

b) Marks obtained by 40 students -

Marks	25	30	15	20	24
No. of students	8	12	10	6	4

$$\text{Mean} = \frac{(25 \times 8) + (30 \times 12) + (15 \times 10) + (20 \times 6) + (24 \times 4)}{40}$$

$$= \frac{200 + 360 + 150 + 120 + 96}{40}$$

$$= \frac{926}{40} = 23.15$$

7) a) Mode for data = 12, 8, 4, 8, 1, 8, 9, 11, 9, 10, 12, 8

Mode for data = 1, 4, 8, 8, 8, 8, 9, 9, 10, 11, 12, 12.

Mode = 8.

b) 15, 22, 17, 19, 22, 17, 29, 24, 17, 15.

15, 15, 17, 17, 17, 19, 22, 22, 24, 29

Mode = 17

c) 0, 3, 2, 1, 3, 5, 4, 3, 42, 1, 2, 0

0, 0, 1, 1, 2, 2, 3, 3, 3, 4, 5, 42

Mode = 3.

d) 1, 7, 2, 4, 5, 9, 8, 3

1, 2, 3, 4, 5, 7, 8, 9

Mode =  $\emptyset$  [ $\because$  mode of the data set/array

is the most frequent appeared number. As there is no such number  $\Rightarrow$  no mode.]

8) 17, x, 24, x+7, 35, 36, 46.

Median = 25.

Median for odd number of elements in data set

$$\text{set} = \frac{(n+1)}{2}^{\text{middle}}$$

$$= \frac{7+1}{2}$$

$$= \frac{8}{2}$$

$$= \underline{4^{\text{th}} \text{ element}}$$

$$\therefore \text{Median} = x + 7 = 25$$

$$\Rightarrow x = \underline{18}$$

$\therefore$  Data set = 17, 18, 24, 25, 35, 36, 46.

9)

$$3\text{Median} = 2\text{Mean} + \text{Mode}$$

$$3(25) = 2 \left( \frac{17+2+24+7+7+35+36+46}{7} \right) + 0$$

$$3(25) = 2/7 (2x + 165)$$

$$3(25)(7) = 4x + 330$$

$$4x = 525 - 330$$

$$x = \frac{195}{4}$$

$$x = \underline{48.75}$$

$$\therefore x = 25 \text{ or } 48.75.$$

10) - Mode is used to find the most common favourite color of students.

a) Mean - Using mean will be the best choice to find the typical day.

As the avg changes, the change in weather can be noticed each day noon.

b) Yes, we can use mean in all the cases.

c) In soccer game, to find the typical height (Average height) we use mean.

d) Here, more frequently used/repeated fav color of students can be ~~said by~~ identified by Mode

(8)

We can count the no. of times each color is said & the highest numbered color will be most common (General answer without logics)