CENTRAL TENDENCIES ASSIGNMENT

1) Find the mean of the following data using hand and compare with numpy.mean()

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

$$\mu = \frac{9+7+11+13+2+4+5+5}{8} = \frac{56}{8} = 7$$

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

$$\mu = \frac{2.2+10.2+14.7+5.9+4.9+11.1+10.5}{7} = \frac{59.5}{7}$$

$$\boxed{\mu = 8.5}$$

c) 1 1/4, 2 1/2, 5 1/2, 3 1/4, 2 1/2

$$\mu = \frac{2.75+10.5+25.5+7.75+10.5}{5} = \frac{57}{5}$$

$$\boxed{\mu = 11.4}$$

2) Find the mean of first 10 Fibonacci numbers

```
x = np.array([0,1])
for i in range(2,10):
    y = x[i-2] + x[i-1]
    x = np.append(x, y)
print(x)
```

$x = 0, 1, 1, 2, 3, 5, 8, 13, 21, 34$

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

Find the mean & median of first 5 prime numbers.

$x = 2, 3, 5, 7, 11$

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

$\text{median} = \frac{n+1}{2} = \frac{5+1}{2} = 3\text{rd item} = 5$

The mean of 8, 11, 6, 14, x and 13 is 66.
Find the value of the observation x

$\mu = \frac{8+11+6+14+x}{5} = 66$

$8+11+6+14+x = 66 \times 5 = 330$

3
66
5
330

5) The mean of 6, 8, x+2, 10, 2x-1 and 2 is 9

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

$$6+8+x+2+10+2x-1+2 = 54$$

$$3x + 27 = 54$$

$$3x = 54 - 27 = 27$$

$$x = \frac{27}{3} = 9$$

$x+2 = 11$

$2x-1 = 17$

6, 8, 11, 10, 17, 2

6) a) The age of 20 boys in a locality is given below

Age in Years	12	10	15	14	8	TOTAL
Number of Boys	5	3	2	6	4	20
Age × frequency	60	30	30	84	32	236

$$\mu = \frac{236}{20} = 11.8$$

6) b) Marks obtained by 40 students in an exam are given below

Marks	25	30	15	20	24	Total
No of Student	8	12	10	6	4	40
marks & frequency	200	360	150	120	96	926

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

7) Find the mode of the following data

a) 12, 8, 4, 8, 1, 8, 9, 11, 9, 10, 12, 8

Sort by ascending

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

7) 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

Sort by ascending

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

8) The following observation are arranged in ascending order. The median of the data is 25. find the value of x.

17, x, 24, $x+7$, 35, 36, 46

$$\text{median} = \frac{n+1}{2} = \frac{8}{2} = 4 \text{ th element}$$

$$x + 7 = 25$$

$$x = 25 - 7$$

$$\boxed{x = 18}$$

17, 18, 24, 25, 35, 36, 46

9) In the above problem, how would you approach the problem if the numbers are not in ascending order?

if the problem is not in ascending order means we can find x value by placing the given mean in $\frac{n+1}{2}$ position. So as per the position x will be the same as previous one.

So there is only one possible value for x for the given mean. if the mean is different then x would be different.

10) In which of these situations would you use the mode to measure the central tendency of the data.

A) Can't use Mode for this case

B) No we can't use the mean in all the given situation

C) Can't use Mode for this.

D) Can use Mode for this.