Central tendency

MEAN

The average value of observations

Formulae = $\frac{\text{sum of all observations}}{\text{Total number of observations}}$

MEDIAN

The mid point value of the observations or the samples

Example = (1 , 4, 7) , the number 4 is in the middle.

Mode

The most common value of the samples/observations

Example ={ 4 , 2, 4, 3, 2, 2} is 2 because it occurs three times

Standard deviation

standard deviation = square root of the variance

Step 1: Find the mean.

Step 2: For each data point, find the square of its distance to the mean.

Step 3: Sum the values from Step 2.

Step 4: Divide by the number of data points.

$$\sigma = \sqrt{\frac{\sum (x_i - \mu)^2}{N}}$$

PYTHON CODE

```
import statistics

statistics.stdev(x) # X is sample x = 7 ,11,16, 14, 11, 13, 19, 13,13
```

Assignment

a) 7 ,11,16, 14, 11, 13, 19, 13,13 Mean = 117/9 = 13 SD = 3.354

b) 16, 15, 16, 17, 19, 12, 14, 9 Mean = 118/8 = 14.75 SD = 3.105

c) 27, 66, 24, 81, 50, 40, 74, 81, 97 Mean = 540/9 = 60 SD = 25.903

Variance

a) 7 ,11,16, 14, 11, 13, 19, 13,13

Variance = (7-13)2+(11-13)2+(1613)2+(14-13)2+(11-13)2+(13-13)2+(19-13)2+(13-13)2+(13-13)2/9 = 11.25

b) 16, 15, 16, 17, 19, 12, 14, 9

Variance=(16-14.75)2+(15-14.75)2+(16-14.75)2+(17-14.75)2+(19-14.75)2+(12-14.75)2+(14-14.75)2+(9-14.75)2/8 = 9.64

c) 27, 66, 24, 81, 50, 40, 74, 81, 97

Variance=(27-60)2+(66-60)2+(24-60)2+(81-60)2+(50-60)2+(40-60)2+(74-60)2+(97-60)2/9 = 670.96