**WEEK 5 ASSIGNMENT**

**Measure of Central Tendency**

Calculate the mean, median, and mode for the following dataset: [5, 7, 2, 8, 5, 3, 7].

SOLUTION

1. MEAN = ∑x/n = 5 + 7 +2 + 8 +5+ 3 + 7/3 = 12.3

2. MEDIAN = 2,3,5,5,7,7,8 = 5

3. MODE = 5 & 7

**Measures of Dispersion**

Compute the range, variance, and standard deviation for the dataset: [12, 15, 18, 22, 25].

1. RANGE = Max – Min = 25-12 = 13
2. VARIANCE:

Mean: x = 18.4

|  |  |  |  |
| --- | --- | --- | --- |
| Ser. | x | x- x | (x- x)2 |
| 1. | 12 | -6.4 | 40.96 |
| 2. | 15 | -3.4 | 11.56 |
| 3. | 18 | -0.4 | 0.16 |
| 4. | 22 | 3.6 | 12.96 |
| 5. | 25 | 6.6 | 43.56 |
| Sum |  |  | 109.2 |

Variance =  *= 109.2/5= 21.84*

3. STANDARD DEVIATION:

S.D = = 4.673

**Outlier Detection**

Identify any outliers in the dataset [17, 20, 21, 18, 95, 22, 19, 23] using the IQR method. Explain your process.

Higher Fence = Q3 + 1.5(IQR)

Lower Fence = Q1 -1.5(IQR)

Arrange dataset in ascending order = 17, 18, 19, 20, 21, 22, 23, 95

Q1 = 18 + 19 =37/2 =18.5, Q3 = 22 + 23/2 = 22.5

IQR = Q3-Q1 = 4

Higher Fence = 22.5 + 1.5(4) = 28.5

Lower Fence = 18.5 – 1.5(4) = 12.5

The outliers are values below 12.5 or greater than 28.5

**Normal Distribution and Z-Score**

A population has a mean of 75 and a standard deviation of 10. Calculate the Z- score for a value of 85.

Z-Score = = 10/10 = 1

**Covariance and Correlation:**Calculate the covariance and correlation coefficient between two variables X and Y

with the following data:

X: [15, 20, 25, 30, 35] Y: [10, 18, 22, 28, 40]

Mean of X (X) = = 25

Mean of Y (Y) = = 23.6

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| S/No | X | X-X | (X-X)2 | Y | Y-Y | (Y-Y)2 | (X-X) (Y-Y) |
| 1 | 15 | -10 | 100 | 10 | -13.6 | 185 | 136 |
| 2 | 20 | -5 | 25 | 18 | -5.6 | 31.36 | 28 |
| 3 | 25 | 0 | 0 | 22 | -1.6 | 2.56 | 0 |
| 4 | 30 | 5 | 25 | 28 | 4.4 | 19.36 | 22 |
| 5 | 35 | 10 | 100 | 40 | 16.4 | 268.96 | 164 |
|  |  |  | 250 |  |  | 507.24 | 350 |
|  |  |  |  |  |  |  |  |

Covariance = = 350/5 = 70

Correlation co-efficient = = = 350/356 = 0.98