# Statistics with R.

## ASSESSMENT - 2

### Question - 1 :

- **Problem :** Find out the Range, standard deviation, quartile deviation & its coefficients from the following data:

| Roll No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Marks | 20 | 28 | 40 | 12 | 30 | 15 | 50 |

- **code & input in R console :**

```
> # RANGE:
> x = c (20, 28, 40, 12, 30, 15, 50)
> x
[1] 20 28 40 12 30 15 50
> summary (x)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  12.00   17.50   28.00   27.86   35.00   50.00
> range = 50-12
> range
[1] 38
>
> # VARIANCE :
> var (x)
[1] 186.8095
>
```

```
> # STANDARD DEVIATION:
> sd = sqrt(var(x))
> sd
[1] 13.66783
>
> # QUARTILE DEVIATION:
> qd = (35-17.50)/2
> qd
[1] 8.75
>
> # COEFFICIENT OF QUARTILE DEVIATION:
> cqd = (35-17.50)/(35+17.50)
> cqd
[1] 0.3333333
>
```

- OUTPUT:

> Range: 38
> standard deviation: 13.66783
> Quartile deviation: 8.75
> Coefficient of Quartile deviation: 0.3333333

## Question - 2 :

**Problem :** Goals scored by two teams in a football match were as follows :-

| no. of goals scored in a football match | No. of football matches played | |
|---|---|---|
| | Team A | Team B |
| 0 | 15 | 20 |
| 1 | 10 | 10 |
| 2 | 07 | 05 |
| 3 | 05 | 04 |
| 4 | 03 | 02 |
| 5 | 02 | 01 |

Calculate coefficient of variation & state which is more consistent.

**Code & Input in R console :-**

```
> # TEAM A
>
> x = c (15, 10, 7, 5, 3, 2)
> mean (x)
[1] 7
> var (x)
[1] 23.6
> sd = sqrt (var (x))
> sd
[1] 4.857983
```

```
> cv = (sd / mean(x)) * 100

> cv
> 69.39976

>
>
> # TEAM B :

>
> y = c(20, 10, 5, 4, 2, 1)
> mean(y)
[1] 7
> var(y)
[1] 50.4
> sd = sqrt(var(y))
> sd
[1] 7.099296
> cv = (sd / mean(y)) * 100
> cv
[1] 101.4185
>
```

Output :-

Team A is more consistent since its coefficient of variation is less.

Sharadindu Adhikari | 19BCE2105

## Question-3 :

- **problem :** Calculate Karl Pearson's coefficient of correlation from the following data and interpret its value :

| Roll no. of students | Marks in Accountancy | Marks in Statistics |
|---|---|---|
| 1 | 48 | 45 |
| 2 | 35 | 20 |
| 3 | 17 | 40 |
| 4 | 23 | 25 |
| 5 | 47 | 45 |

- **Code & Input in R console :**

```
> x = c (48, 35, 17, 23, 47)
> y = c (45, 20, 40, 25, 45)
> var(x)
[1] 194
> var(y)
[1] 137.5
> var(x, y)
[1] 70
```

Sharadindu Adhikari | 19BCE2105

```
> r = var(x,y) / sqrt(var(x) * var(y))
> r
[1] 0.4285937
> cor.test(x,y, method = "pearson")
```

pearson's product-moment correlation

data : x and y

t = 0.82164 , df = 3, p-value = 0.4715

alternative hypothesis : true correlation is not equal to 0

95 percent confidence ~~level~~ interval :

-0.7295343 0.9511849

sample estimates :

cor

0.4285937

Sharadindu Adhikari | 19BCE2105