MAT5007 – Applied Statistical Methods

Embedded Lab – R Statistical Software

FALL SEMESTER – 2022~2023 L25+L26 SLOT

E-RECORD

Assignment No.: 1

Submitted By

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MCA– I Year

SITE

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Date: 01/12/2022

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Experiment 1:

Collect at least 60 students and analyse the data by using descriptive statistics and interpret the results.

38 7 10 41 21 28 38 50 10 17 20 49 28 46 26 34 43 11 15 25 31 6 37 28 21 50 27 4 39 2 47 2 28 0 10 40 21 0 48 21 45 11 45 19 41 37 38 11 37 6 32 37 12 12 20 50 35 12 31 50

```
> marks = c(38, 7, 10, 41, 21, 28, 38, 50, 10, 17, 20, 49, 28, 46, 26, 34, 43,
11, 15, 25, 31, 6, 37, 28, 21, 50, 27, 4, 39, 2, 47, 2, 28, 0, 10, 40, 21, 0, 48,
21, 45, 11, 45, 19, 41, 37, 38, 11, 37, 6, 32, 37, 12, 12, 20, 50, 35, 12, 31,
50)
```

```
> marks = c(38, 7, 10, 41, 21, 28, 38, 50, 10, 17, 20, 49, 28, 46,
 26, 34, 43, 11, 15, 25, 31, 6, 37, 28, 21, 50, 27, 4, 39, 2, 47,
 2, 28, 0, 10, 40, 21, 0, 48, 21, 45, 11, 45, 19, 41, 37, 38, 11,
 37, 6, 32, 37, 12, 12, 20, 50, 35, 12, 31, 50)
> marks
 [1] 38  7 10 41 21 28 38 50 10 17 20 49 28 46 26 34 43 11 15
[20] 25 31  6 37 28 21 50 27  4 39  2 47  2 28  0 10 40 21  0
[39] 48 21 45 11 45 19 41 37 38 11 37  6 32 37 12 12 20 50 35
[58] 12 31 50
```

```
> summary(marks)
```

```
> summary(marks)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   0.00   12.00   28.00   26.67   38.25   50.00
```

Mean

```
> mean(marks)
```

```
> mean(marks)
[1] 26.66667
```

Interpretation: Therefore, the mean/average marks of the class is 26.66667

Median

```
> media(marks)
```

```
> median(marks)
[1] 28
```

Interpretation: Therefore, the median marks of the class is 28

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Mode

```
> marksTable = table(marks)
> mode = marksTable[marksTable == max(marksTable)]
> mode
```

```
> marksTable = table(marks)
> mode = marksTable[marksTable == max(marksTable)]
> mode
marks
21 28 37 50
 4  4  4  4
```

Interpretation: Here we observe four-mark values have the same highest frequency of 4 in the marks data set. So, this is a multimodal dataset with 21, 28, 37 and 50 as mode.

Range

```
> maxMarks = max(marks)
> minMarks = min(marks)
> range = maxMarks - minMarks
> range
```

```
> maxMarks = max(marks)
> minMarks = min(marks)
> range = maxMarks - minMarks
> range
[1] 50
```

Interpretation: Since the range is difference between largest value - 50 marks in this data and the smallest value - 0 mark in this data, the range is 50.

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Quartile Deviation

```
> Q1 = quantile(marks, 0.25)
> Q3 = quantile(marks, 0.75)
> quartileDeviation = (Q3 - Q1) / 2
> quartileDeviation
```

```
> Q1 = quantile(marks, 0.25)
> Q3 = quantile(marks, 0.75)
> quartileDeviation = (Q3 - Q1) / 2
> quartileDeviation
    75%
13.125
```

Coefficient of Quartile Deviation

```
> coeffOfQD = (Q3 - Q1) / (Q3 + Q1)
> coeffOfQD
```

```
> coeffofQD = (Q3 - Q1) / (Q3 + Q1)
> coeffofQD
       75%
0.5223881
```

Mean Deviation about Mean

```
> meanMarks = mean(marks)
> mdAboutmean = sum(abs(marks - meanMarks)) / length(marks)
> mdAboutmean
```

```
> meanMarks = mean(marks)
> mdAboutmean = sum(abs(marks - meanMarks)) / length(marks)
> mdAboutmean
[1] 13.15556
```

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Mean Deviation about Median

```
> medianMarks = median(marks)
> mdAboutMedian = sum(abs(marks - medianMarks)) / length(marks)
> mdAboutMedian
```

```
> medianMarks = median(marks)
> mdAboutMedian = sum(abs(marks - medianMarks)) / length(marks)
> mdAboutMedian
[1] 13.1
```

Standard Deviation

```
> sd(marks)
```

```
> sd(marks)
[1] 15.2523
```

Variance

```
> var(marks)
```

```
> var(marks)
[1] 232.6328
```

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