

**SIDDHI SINGH**

**17BIT0028**

12/11/17

### PROBLEM: 1

```
> x = c(18, 19, 19, 19, 19, 20, 20, 20, 20, 20, 21, 21, 21, 21,
        22, 23, 24, 27, 30, 36)
> mean(x)
[1] 22
> median(x)
[1] 20.5
> y = x[x < 25]
> md = median(y)
> md
[1] 20
> xr = table(x)
> mode = which(xr == max(xr))
> mode
20
3
```

### PROBLEM 2

```
> x = c(0, 1, 2, 3)
> f = c(8, 11, 5, 1)
> y = rep(x, f)
> mean = (sum(y)) / (length(y))
> mean
[1] 0.96
> median(y)
[1] 1
```



## PROBLEM 3:

```
> mid = seq(147.5, 182.5, 5)
```

```
> mid
```

```
[1] 147.5 152.5 157.5 162.5 167.5 172.5 177.5 182.5
```

```
> f = c(4, 6, 28, 58, 64, 30, 5, 5)
```

```
> fr.ditr = data.frame(mid, f)
```

```
> fr.ditr
```

	mid	f
1	147.5	4
2	152.5	6
3	157.5	28
4	162.5	58
5	167.5	64
6	172.5	30
7	177.5	5
8	182.5	5

Mean :-

```
> mean = (sum(mid*f))/sum(f)
```

```
> mean
```

```
[1] 165.175
```

Median :-

```
> midn = seq(147.5, 182.5, 5)
```

```
> frequency = c(4, 6, 28, 58, 64, 30, 5, 5)
```

```
> fr.ditr <- data.frame(midn, frequency)
```

```
> fr.ditr
```

	midn	frequency
1	147.5	4
2	152.5	6
3	157.5	28

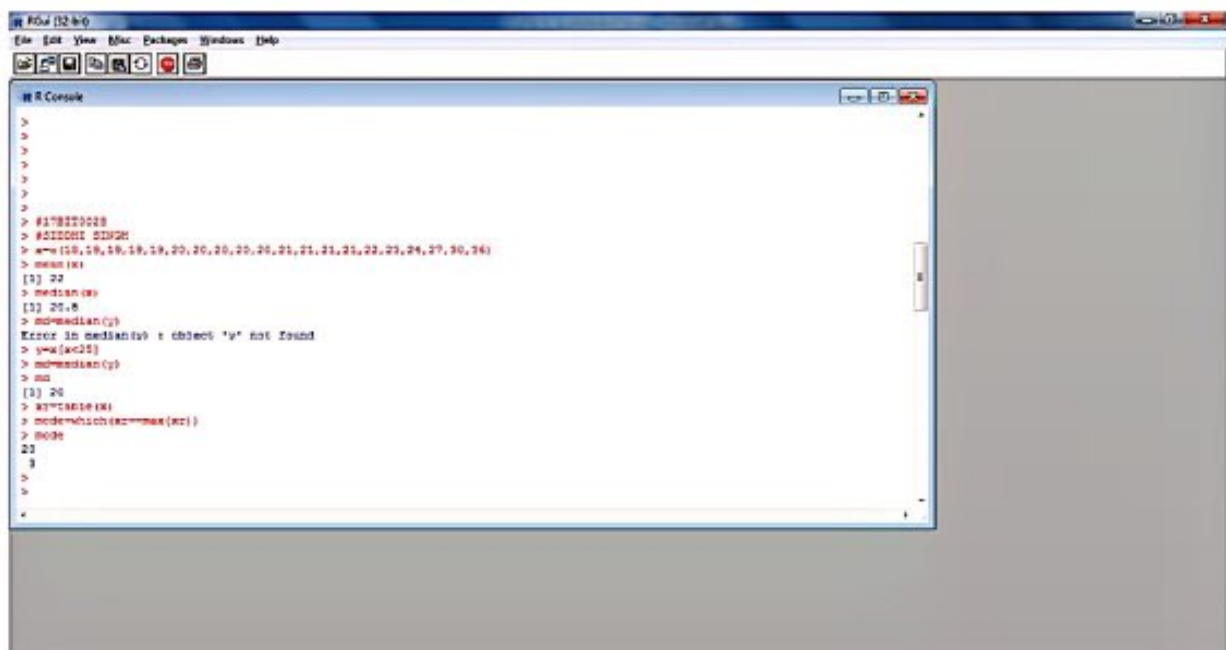
```
RStudio [32-bit] - R Console
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> #170210020
> #SIDHVI SINGH
> data=read.csv("C:\\Users\\170210020\\Downloads\\Exercise 1 and 4 dataset.csv")
> data
  SUBJECT AGE GENDER MARRIED INCOME6 HEALTHC CHILDC LITERS6C SEX DRUGS MEDIC FINISH LITERS6C TOBACC
1      1  16      0      0      0      30      0      17 17      1      30      1      22  26
2      2  28      1      0      0      35      0      18 23      1      39      1      20  35
3      3  16      1      1      16      22      1      39 43      0      20      1      42  16
4      4  23      1      0      6      31      0      22 33      0      60      1      45  13
5      5  18      0      1      7      52      0      25 32      0      52      0      20  14
6      6  30      0      1      25      49      2      33 36      1      39      0      39  38
7      7  19      0      1      19      36      0      28 43      0      51      1      39  45
8      8  19      1      0      0      32      2      17 52      0      35      1      21  16
9      9  34      0      0      29      60      2      23 56      0      28      1      28  64
10     10 16      1      0      0      33      0      21 27      0      29      0      37  19
11     11 13 28      1      0      8      39      0      18 34      1      61      1      40  56
12     12 16      1      1      1      42      0      31 29      1      58      1      35  10
13     13 16      0      0      0      43      0      15 28      1      39      1      32  11
14     14 16      0      1      18      54      1      24 38      0      40      0      37  44
15     15 16      1      0      0      32      0      23 38      0      27      1      35  25
16     16 32      1      1      28      44      1      39 37      0      30      0      47  38
17     17 19      0      0      0      46      0      17 23      0      36      1      26  39
18     18 17      1      1      10      39      2      48 33      0      43      0      42   6
19     19 24      0      0      17      22      0      16 36      0      54      1      20  15
20     20 26      1      1      12      37      1      39 43      0      32      1      42  67

> save.image("C:\\Users\\170210020\\Desktop\\exp01ab")
>
```

*Problem 1: Twenty students , graduates and undergraduates, were enrolled in a statistics course. Their ages were 18,19,19,19,19,20,20,20,20,20,21,21,21,21,22,23,24,27,30,36.*

- a) Find Mean and Median of all students*
- b) Find median age of all students under 25 years.*
- c) Find modal age of all students*



```
R #0.9 (32-bit)
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R Console
> 
> 
> 
> 
> 
> 
> #178220028
> #010001 010028
> x=c(18,19,19,19,19,20,20,20,20,20,21,21,21,21,22,23,24,27,30,36)
> mean(x)
[1] 22
> median(x)
[1] 20.5
> m=median(y)
Error in median(x) : object 'y' not found
> y=x[ac25]
> m=median(y)
> m
[1] 20
> as.vector(x)
> mode=which.max(table(x))
> mode
[1] 3
> 
> 
>
```

*Problem 2 : A survey of 25 faculty members is taken in a college to study their Vocational mobility. They were asked the question “In addition to your present Position, at how many educational institutes have served on the Faculty? Following is the frequency distribution of their responses.*

<i>X</i>	0	1	2	3
<i>f</i>	8	11	5	1

*Find mean and median of the distribution*

The screenshot shows an R Studio window with the following code in the console:

```

> x=c(0,1,2,3)
> f=c(8,11,5,1)
> y=x*f
> mean=(sum(y))/(length(y))
> mean
[1] 0.96
> median(y)
[1] 1
> |
  
```

The window title is "RStudio (32-bit)". The menu bar includes File, Edit, View, Misc, Packages, Windows, and Help. The toolbar contains icons for file operations and running code. The status bar at the bottom shows the time as 3:05 PM on 1/8/2018.



### Problem 3: Compute mean, median and mode of for the following frequency Distribution:

Height in Cm	145-150	150-155	155-160	160-165	165-170	170-175	175-180	180-185
No. of Adult men	4	6	28	58	64	30	5	5

```

RStudio (32-bit) - R Console
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[Icons]

> mid=seq(147.5,182.5,5)
> mid
[1] 147.5 152.5 157.5 162.5 167.5 172.5 177.5 182.5
> f=c(4,6,28,58,64,30,5,5)
> fr.data<-data.frame(mid,f)
> fr.data
  mid f
1 147.5 4
2 152.5 6
3 157.5 28
4 162.5 58
5 167.5 64
6 172.5 30
7 177.5 5
8 182.5 5
> mean=(sum(mid*f))/sum(f)
> mean
[1] 165.175
> mid=seq(147.5,182.5,5)
> frequency=c(4,6,28,58,64,30,5,5)
> fr.data<-data.frame(mid,frequency)
> fr.data
  mid frequency
1 147.5      4
2 152.5      6
3 157.5     28
4 162.5     58
5 167.5     64
6 172.5     30
7 177.5      5
8 182.5      5
> c1=column(frequency)
> c1
[1] 4 30 38 86 160 190 195 200
> n=length(frequency)
Error: object 'frequency' not found
> n=length(frequency)
> n
[1] 8

```

```

RStudio (32-bit)
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[Icons]

> c1=column(frequency)
> c1
[1] 4 30 38 86 160 190 195 200
> sum(frequency)
Error: object 'frequency' not found
> n=length(frequency)
> n
[1] 200
> sum(frequency)/sum(frequency)
[1] 0
> n=length(frequency)
> n
[1] 8
> f=frequency[n]
> f
[1] 64
> c1=c1[-1]
> c1
[1] 4
> sum(f)/n
[1] 165
> median=1+(160/2)-(5/2)*n
> median
[1] 165.125
> mode=c1[frequency==max(frequency)]
> mode
[1] 5
> f=frequency[n]
> f
[1] 64
> f1=frequency[n-1]
> f2=frequency[n+1]
> f1
[1] 58
> f2
[1] 30
> 1+max(f1,f2)
[1] 58
> mode=1+(160/2)-(5/2)*n
> mode
[1] 165.125
>

```

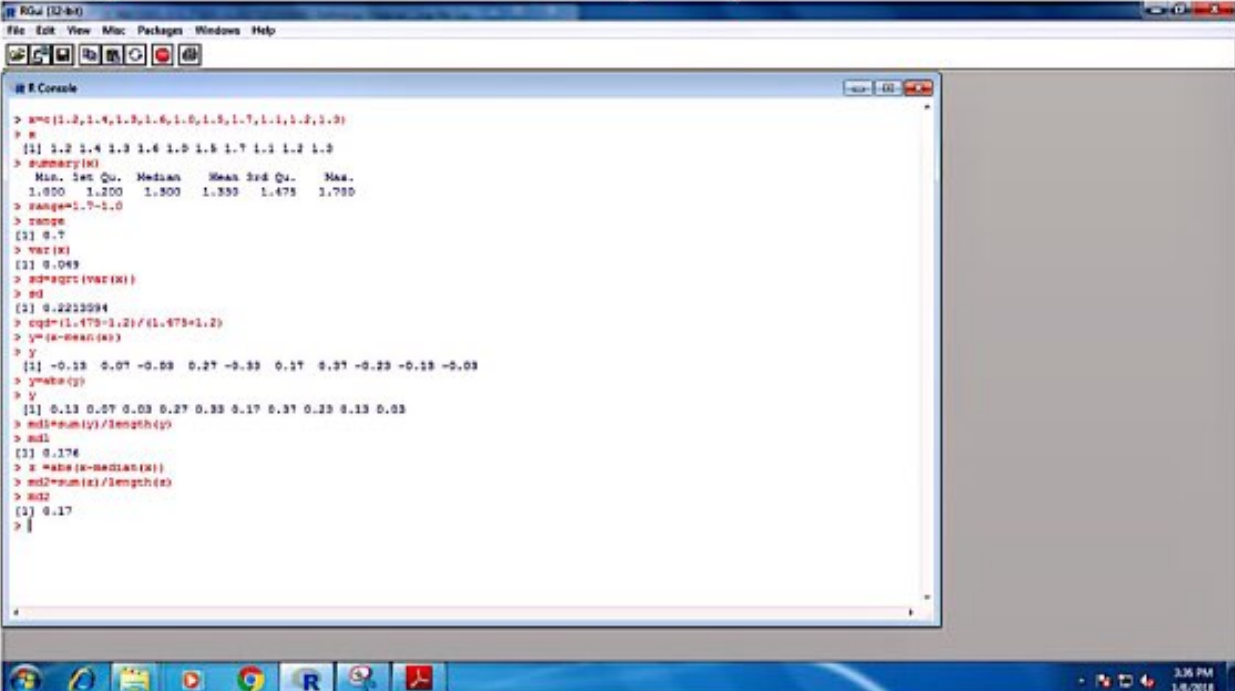
```

RStudio (32-bit)
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[Icons]

> c1
[1] 86
> 1+max(f1,f2)
[1] 58
> mode=1+(160/2)-(5/2)*n
> mode
[1] 165.125
> mode=c1[frequency==max(frequency)]
> mode
[1] 5
> f=frequency[n]
> f
[1] 64
> f1=frequency[n-1]
> f2=frequency[n+1]
> f1
[1] 58
> f2
[1] 30
> 1+max(f1,f2)
[1] 58
> mode=1+(160/2)-(5/2)*n
> mode
[1] 165.125
>

```

*An entomologist studying morphological variation in species of mosquito recorded the following data on body length: 1.2, 1.4, 1.3, 1.6, 1.0, 1.5, 1.7, 1.1, 1.2, 1.3. Compute all the measures of dispersion.*



```

RGui [32-bit]
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> x=c(1.2,1.4,1.3,1.6,1.0,1.5,1.7,1.1,1.2,1.3)
> x
[1] 1.2 1.4 1.3 1.6 1.0 1.5 1.7 1.1 1.2 1.3
> summary(x)
   Min. 1st Qu.  Median     Mean 3rd Qu.    Max.
 1.000   1.200   1.300   1.350   1.475   1.700
> range=x[1]-x[10]
> range
[1] 0.7
> var(x)
[1] 0.049
> sd=sqrt(var(x))
> sd
[1] 0.2213594
> cqd=(1.475-1.2)/(1.475-1.0)
> y=(x-mean(x))
> y
[1] -0.13  0.07 -0.03  0.27 -0.33  0.17  0.37 -0.23 -0.13 -0.03
> y=abs(y)
> y
[1] 0.13 0.07 0.03 0.27 0.33 0.17 0.37 0.23 0.13 0.03
> m1=sum(y)/length(y)
> m1
[1] 0.176
> x=abs(x-median(x))
> m2=sum(x)/length(x)
> m2
[1] 0.17
>

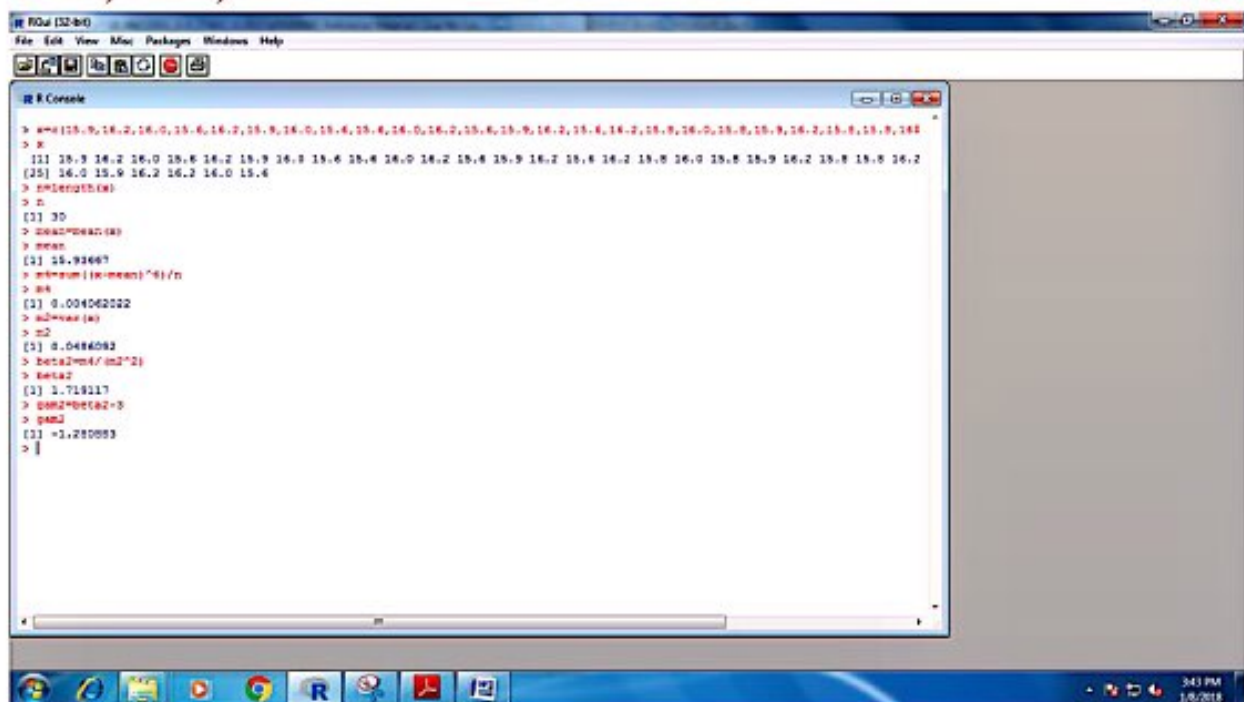
```



## ***Measure of skewness and kurtosis using Moments:***

***Problem : A quality control engineer is interested in determining whether a machine is properly adjusted to dispense 16 ounces of sugar. Following data refer to the net weight (in ounces) packed in thirty one-pound bags after the machine was adjusted. Compute the measures skewness and kurtosis***

***15.9, 16.2, 16.0, 15.6, 16.2, 15.9, 16.0, 15.6, 15.6, 16.0, 16.2, 15.6, 15.9, 16.2, 15.6, 16.2, 15.8, 16.0, 15.8, 15.9, 16.2, 15.8, 15.8, 16.2, 16.0, 15.9, 16.2, 16.2, 16.0, 15.6***



```
RStudio [32-bit]
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R Console
> x=c(15.9,16.2,16.0,15.6,16.2,15.9,16.0,15.6,15.6,16.0,16.2,15.6,15.9,16.2,15.6,16.2,15.8,16.0,15.8,15.9,16.2,15.8,15.8,16.2,16.0,15.9,16.2,16.2,16.0,15.6)
> x
[1] 15.9 16.2 16.0 15.6 16.2 15.9 16.0 15.6 15.6 16.0 16.2 15.6 15.9 16.2 15.6 16.2 15.8 16.0 15.8 15.9 16.2 15.8 15.8 16.2 16.0 15.9 16.2 16.2 16.0 15.6
> n=length(x)
> n
[1] 30
> sum(x)/n
> mean
[1] 15.93667
> sqrt(sum((x-mean)^2)/n)
> sd
[1] 0.004062022
> sd^2/var(x)
> m2
[1] 0.0486082
> beta2=m2/(m2^2)
> beta2
[1] 1.718217
> sum((beta2-3)^2)/n
> gsm2
[1] -1.280883
> |
```