

LAB ASSIGNMENT – 1

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COURSE CODE	MAT2001
COURSE NAME	STATISTICS FOR ENGINEERS
SLOT	L7+L8
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Experiment-1

1. (a) The following data represents income distribution of 100 families, Calculate mean income of 100 families.

Income in thousands	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Number of families	8	12	25	22	16	11	6

R CODE & OUTPUT:

```
> x=seq(35,95,10)
> f=c(8,12,25,22,16,11,6)
> fr.distr=data.frame(x,f)
> fr.distr
  x  f
1 35  8
2 45 12
3 55 25
4 65 22
5 75 16
6 85 11
7 95  6
> mean=(sum(x*f))/(sum(f))
> mean
[1] 63.3
```

ANS:

MEAN INCOME	63.3
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(b) Find the median for the following frequency distribution.

X	1	2	3	4	5	6	7	8	9
Frequency	8	10	11	16	20	25	15	9	6

R CODE & OUTPUT:

```
> x=seq(1,9)
> f=c(8,10,11,16,20,25,15,9,6)
> fr.distr=data.frame(x,f)
> fr.distr
  x  f
1 1  8
2 2 10
3 3 11
4 4 16
5 5 20
6 6 25
7 7 15
8 8  9
9 9  6
> y=rep(x,f)
> median(y)
[1] 5
```

ANS:

MEDIAN	5
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2. (a) Calculate the S.D. from the following data:

Daily wages (in Rs)	40-50	50-60	60-70	70-80	80-90	90-100
No. of workers	10	15	25	35	8	7

R CODE & OUTPUT:

```
> x=seq(45,95,10)
> f=c(10,15,25,35,8,7)
> fr.distr=data.frame(x,f,x*f,(x^2)*f)
> fr.distr
  x  f x...f X.x.2....f
1 45 10  450    20250
2 55 15  825    45375
3 65 25 1625   105625
4 75 35 2625   196875
5 85  8  680    57800
6 95  7  665    63175
> var=((sum((x^2)*f))/(sum(f)))-(((sum(x*f))/(sum(f)))^2)
> var
[1] 171.31
> S.D=sqrt(var)
> S.D
[1] 13.08854
```

ANS:

STANDARD DEVIATION	13.08854
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(b) Find the Interquartile Range from the following data

Time to travel to work	1-10	11-20	21-30	31-40	41-50
Frequency	3	6	9	13	8

R CODE & OUTPUT:

```
> x=seq(5.5,45.5,10)
> f=c(3,6,9,13,8)
> cl=cumsum(f)
> fr.distr=data.frame(x,f,cl)
> fr.distr
  x f cl
1 5.5 3 3
2 15.5 6 9
3 25.5 9 18
4 35.5 13 31
5 45.5 8 39
> n=sum(f)
> h=10
> m1=min(which(cl>=n/4))
> m3=min(which(cl>=(3*n)/4))
> f1=f[m1]
> f3=f[m3]
> c1=cl[m1-1]
> c3=cl[m3-1]
> l1=x[m1]-h/2
> l3=x[m3]-h/2
> Q1=l1+(((n/4)-c1)/f1)*h
> Q1
[1] 21.33333
> Q3=l3+((((3*n)/4)-c3)/f3)*h
> Q3
[1] 39.15385
> IQR=Q3-Q1
> IQR
[1] 17.82051
```

ANS:

INTERQUARTILE RANGE

17.82051
