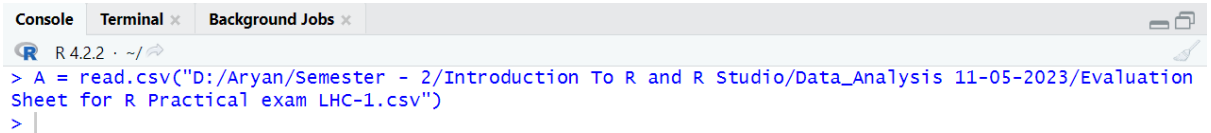Name:- Aryan Dilipbhai Langhanoja

Roll-no :- 92200133030

1) A = read.csv("D:/Aryan/Semester - 2/Introduction To R and R Studio/Data_Analysis 11-05-2023/Evaluation Sheet for R Practical exam LHC-1.csv")

```
Console  Terminal ×  Background Jobs ×
R  R 4.2.2 · ~/
> A = read.csv("D:/Aryan/Semester - 2/Introduction To R and R Studio/Data_Analysis 11-05-2023/Evaluation
Sheet for R Practical exam LHC-1.csv")
> |
```

2)

ESE = A$ESE1

CSE = c()
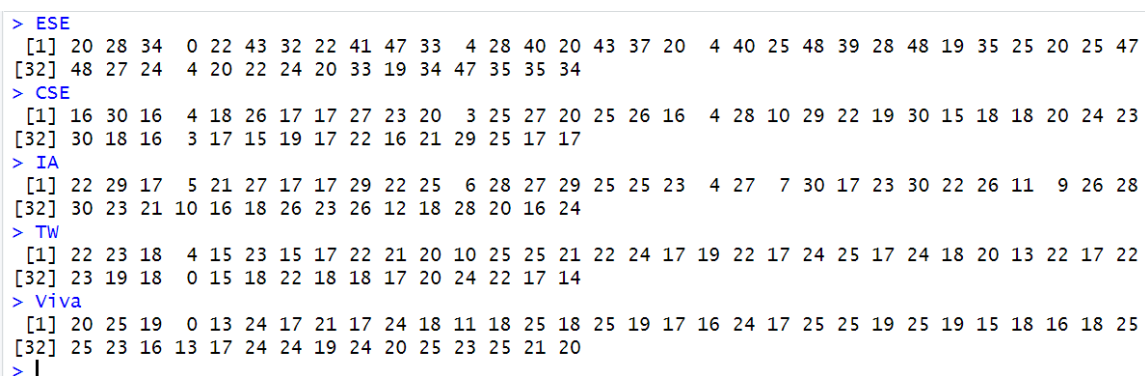
IA = c()

TW = c()

Viva = c()

for(i in 1:nrow(A)){

  CSE = append(CSE,(A$Quiz.1[i] + A$Assignment1[i] + A$Assignment2[i] + A$Assignment.3[i] + A$Assignment4[i] + A$Assignment5[i] + A$Coding.Exercise.1[i] + A$Coding.Exercise.2[i]))

  IA = append(IA,(A$IITB[i] + A$Debug1[i] + A$Debug2[i] + A$Debug3[i] + A$Debug4[i]))

  TW = append(TW,(A$Mooc1[i] + A$TW.Test1[i] + A$TW.Test.2[i]))

  Viva = append(Viva,(A$Oral.VIVA[i] + A$Long.Hour[i]))

}

```
> ESE
 [1] 20 28 34  0 22 43 32 22 41 47 33  4 28 40 20 43 37 20  4 40 25 48 39 28 48 19 35 25 20 25 47
[32] 48 27 24  4 20 22 24 20 33 19 34 47 35 35 34
> CSE
 [1] 16 30 16  4 18 26 17 17 27 23 20  3 25 27 20 25 26 16  4 28 10 29 22 19 30 15 18 18 20 24 23
[32] 30 18 16  3 17 15 19 17 22 16 21 29 25 17 17
> IA
 [1] 22 29 17  5 21 27 17 17 29 22 25  6 28 27 29 25 25 23  4 27  7 30 17 23 30 22 26 11  9 26 28
[32] 30 23 21 10 16 18 26 23 26 12 18 28 20 16 24
> TW
 [1] 22 23 18  4 15 23 15 17 22 21 20 10 25 25 21 22 24 17 19 22 17 24 25 17 24 18 20 13 22 17 22
[32] 23 19 18  0 15 18 22 18 18 17 20 24 22 17 14
> Viva
 [1] 20 25 19  0 13 24 17 21 17 24 18 11 18 25 18 25 19 17 16 24 17 25 25 19 25 19 15 18 16 18 25
[32] 25 23 16 13 17 24 24 19 24 20 25 23 25 21 20
> |
```

3)

CSE_Mapped = CSE *20/31

(Note - Remaining Components are already mapped in given limits)

```
> ESE
 [1] 20 28 34  0 22 43 32 22 41 47 33  4 28 40 20 43 37 20  4 40 25 48 39 28 48 19 35 25 20 25 47
[32] 48 27 24  4 20 22 24 20 33 19 34 47 35 35 34
> CSE
 [1] 16 30 16  4 18 26 17 17 27 23 20  3 25 27 20 25 26 16  4 28 10 29 22 19 30 15 18 18 20 24 23
[32] 30 18 16  3 17 15 19 17 22 16 21 29 25 17 17
> IA
 [1] 22 29 17  5 21 27 17 17 29 22 25  6 28 27 29 25 25 23  4 27  7 30 17 23 30 22 26 11  9 26 28
[32] 30 23 21 10 16 18 26 23 26 12 18 28 20 16 24
> TW
 [1] 22 23 18  4 15 23 15 17 22 21 20 10 25 25 21 22 24 17 19 22 17 24 25 17 24 18 20 13 22 17 22
[32] 23 19 18  0 15 18 22 18 18 17 20 24 22 17 14
> Viva
 [1] 20 25 19  0 13 24 17 21 17 24 18 11 18 25 18 25 19 17 16 24 17 25 25 19 25 19 15 18 16 18 25
[32] 25 23 16 13 17 24 24 19 24 20 25 23 25 21 20
> CSE_Mapped = CSE *20/31
> CSE_Mapped
 [1] 10.322581 19.354839 10.322581  2.580645 11.612903 16.774194 10.967742 10.967742 17.419355
[10] 14.838710 12.903226  1.935484 16.129032 17.419355 12.903226 16.129032 16.774194 10.322581
[19]  2.580645 18.064516  6.451613 18.709677 14.193548 12.258065 19.354839  9.677419 11.612903
[28] 11.612903 12.903226 15.483871 14.838710 19.354839 11.612903 10.322581  1.935484 10.967742
[37]  9.677419 12.258065 10.967742 14.193548 10.322581 13.548387 18.709677 16.129032 10.967742
[46] 10.967742
> |
```

4)

ESE_SP = data.frame(X = A$Enrollment , y = A$ESE1)

CSE_SP = data.frame(x = A$Enrollment ,y = CSE_Mapped)

IA_SP = data.frame(x = A$Enrollment , y = IA)

TW_SP = data.frame(x = A$Enrollment , y = TW)
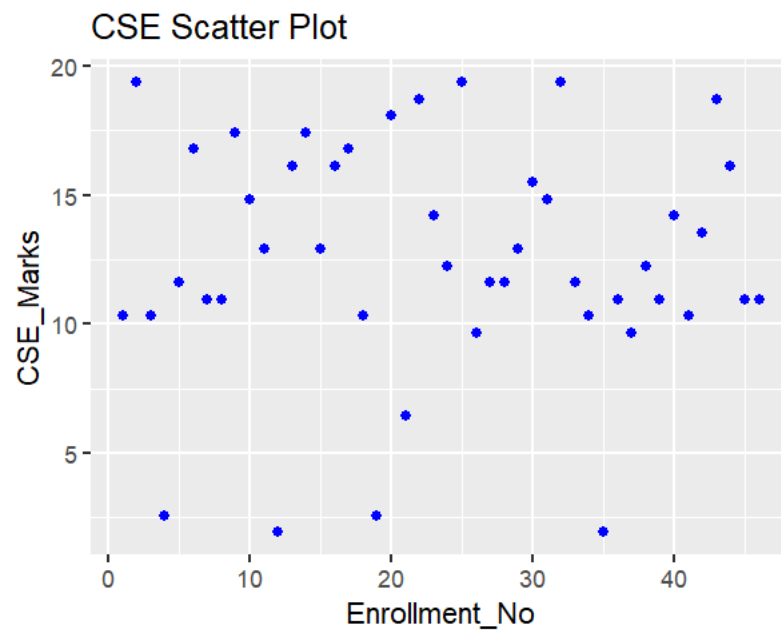
Viva_SP = data.frame(x = A$Enrollment , y = Viva)
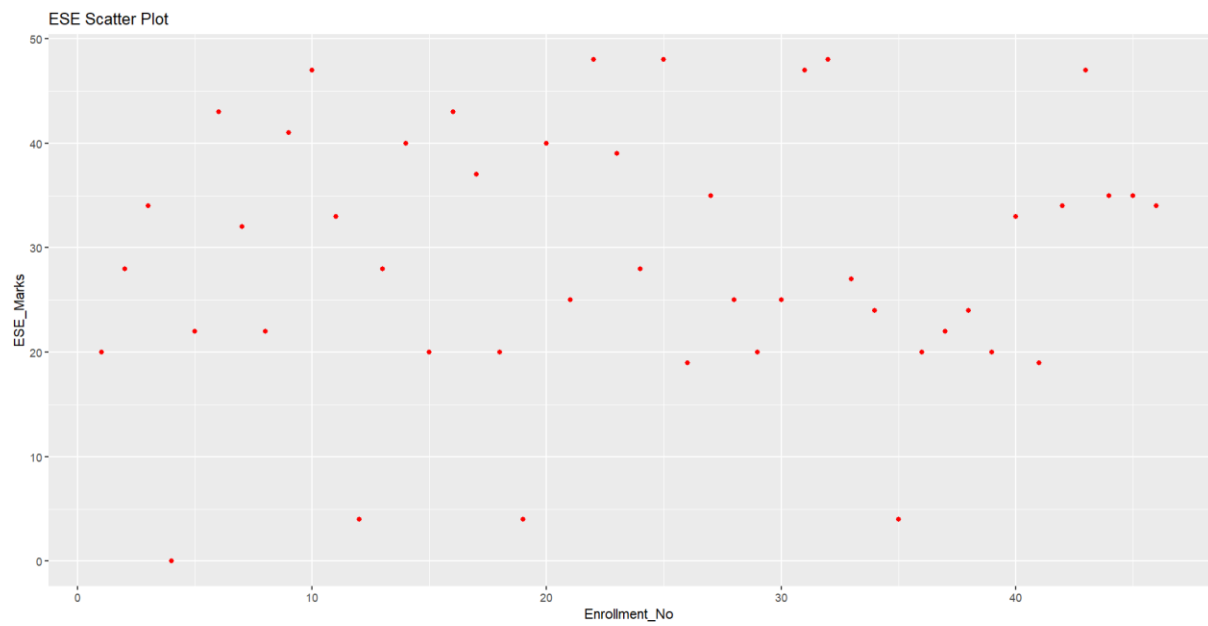

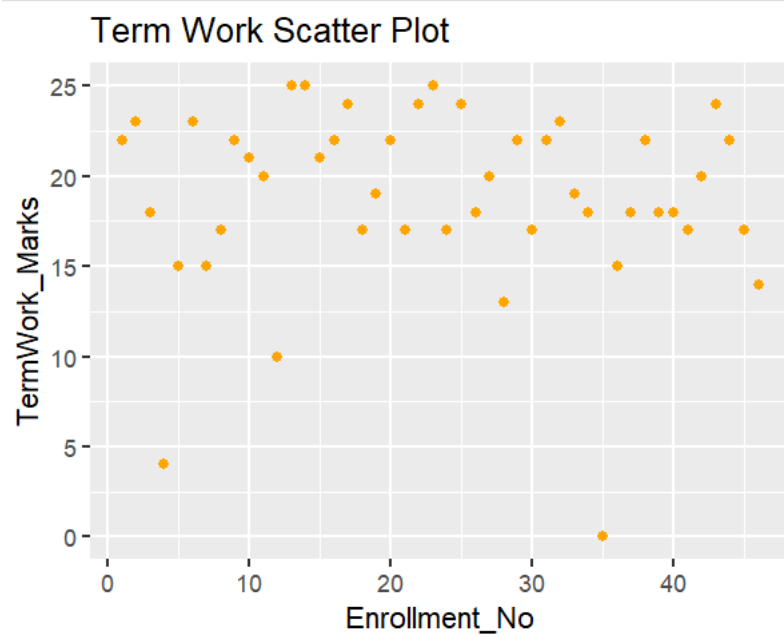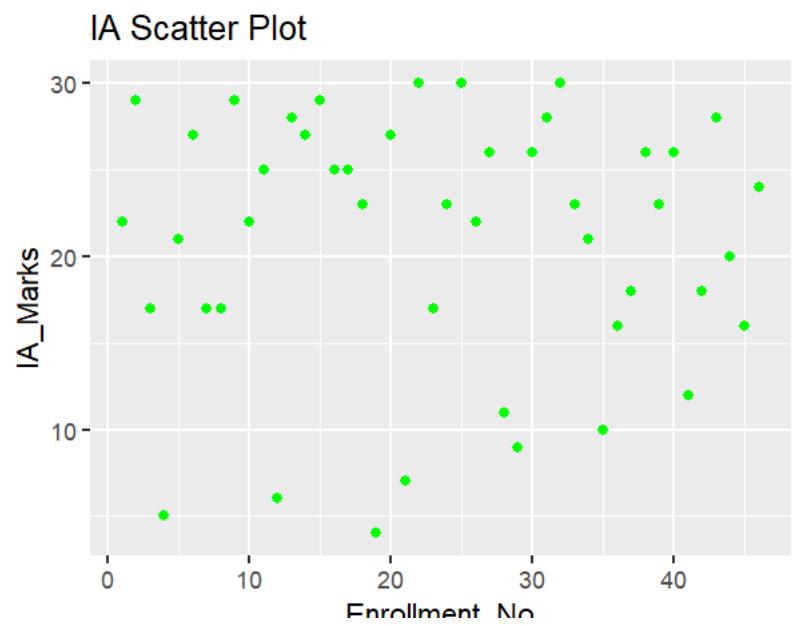ggplot(ESE_SP,aes(x = X ,y = y)) + geom_point(col = "red") + labs(x = "Enrollment_No", y = "ESE_Marks", title = "ESE Scatter Plot")

ggplot(CSE_SP,aes(x = x ,y = y)) + geom_point(col = "blue") + labs(x = "Enrollment_No", y = "CSE_Marks", title = "CSE Scatter Plot")

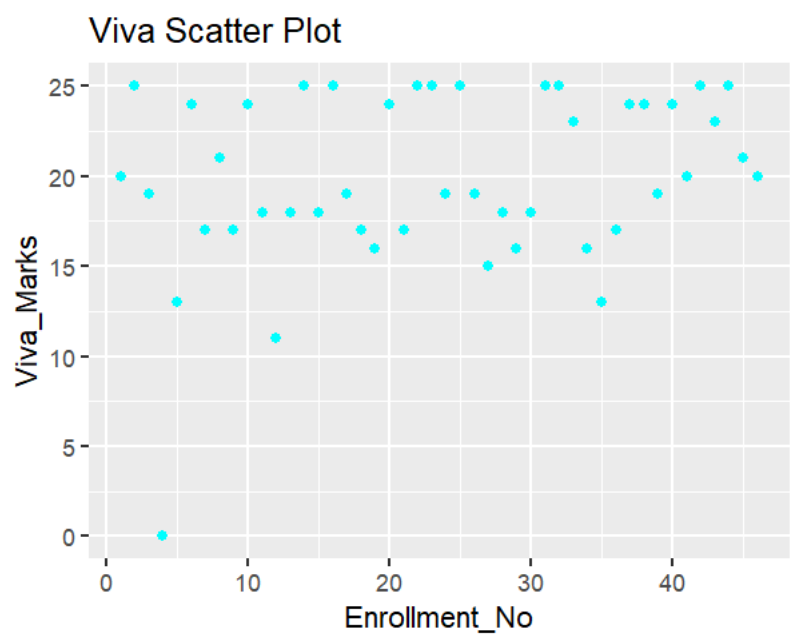ggplot(IA_SP,aes(x = x ,y = y)) + geom_point(col = "green") + labs(x = "Enrollment_No", y = "IA_Marks", title = "IA Scatter Plot")

ggplot(TW_SP,aes(x = x ,y = y)) + geom_point(col = "orange") + labs(x = "Enrollment_No", y = "TermWork_Marks", title = "Term Work Scatter Plot")

ggplot(Viva_SP,aes(x = x ,y = y)) + geom_point(col = "cyan") + labs(x = "Enrollment_No", y = "Viva_Marks", title = "Viva Scatter Plot")

ESE Scatter Plot

CSE Scatter Plot

IA Scatter Plot

Term Work Scatter Plot

Viva Scatter Plot

5)

ggplot(ESE_SP,aes(x = X ,y = y)) + geom_boxplot() +   labs(x = "Enrollment_No", y = "ESE_Marks", title = "ESE Scatter Plot")

ggplot(CSE_SP,aes(x = x ,y = y)) + geom_boxplot() +   labs(x = "Enrollment_No", y = "CSE_Marks", title = "CSE Scatter Plot")

ggplot(IA_SP,aes(x = x ,y = y)) + geom_boxplot() +   labs(x = "Enrollment_No", y = "IA_Marks", title = "IA Scatter Plot")

ggplot(TW_SP,aes(x = x ,y = y)) + geom_boxplot() +   labs(x = "Enrollment_No", y = "TermWork_Marks", title = "Term Work Scatter Plot")
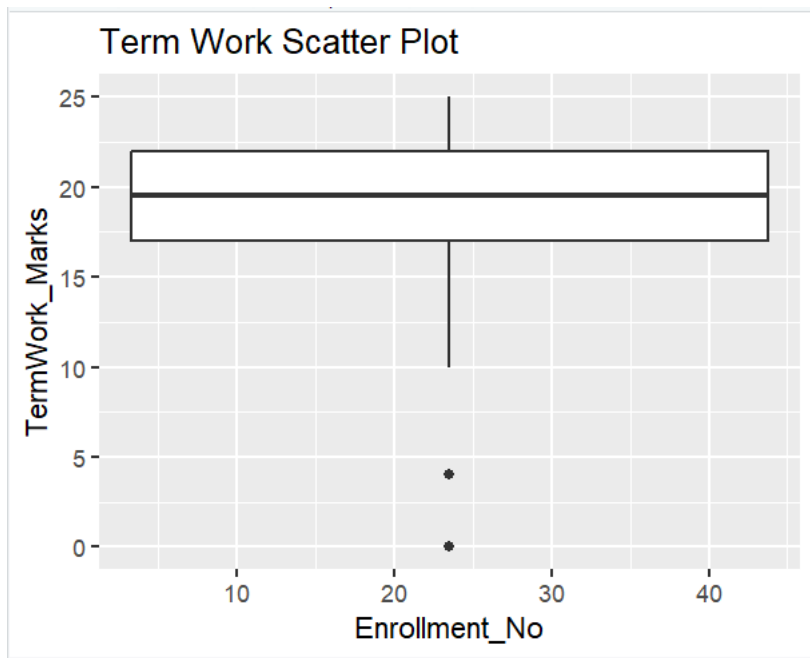
ggplot(Viva_SP,aes(x = x ,y = y)) + geom_boxplot()+   labs(x = "Enrollment_No", y = "Viva_Marks", title = "Viva Scatter Plot")

ESE Scatter Plot

CSE Scatter Plot

IA Scatter Plot

Term Work Scatter Plot

Viva Scatter Plot
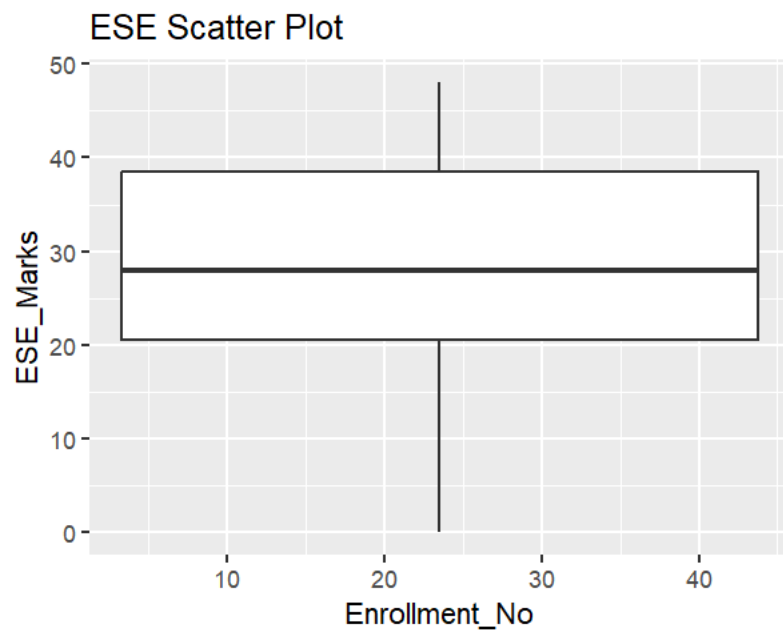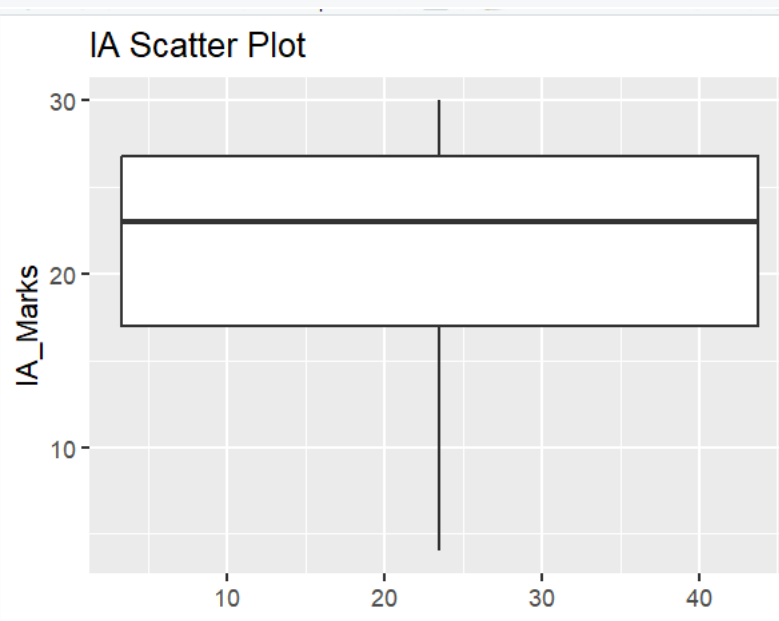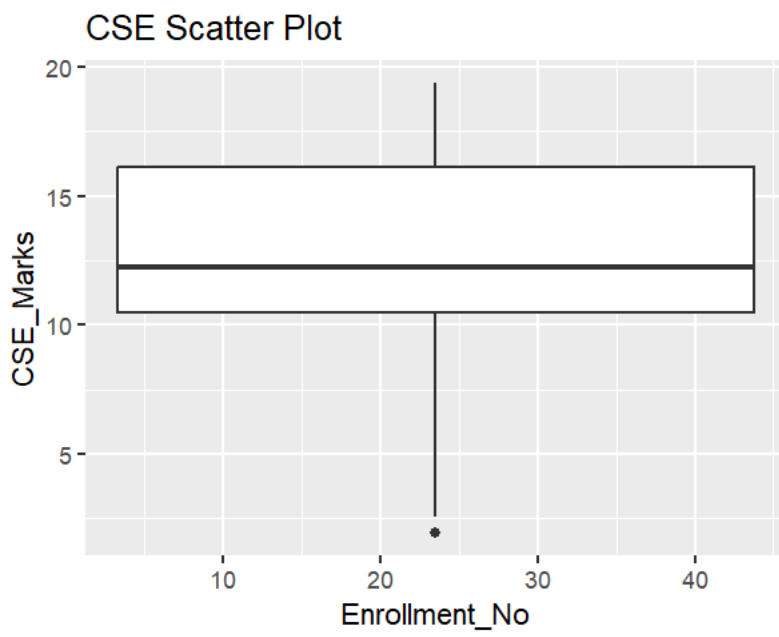
6)

Stat_ESE = summary(ESE)

Stat_CSE = summary(CSE_Mapped)

Stat_IA = summary(IA)

Stat_TW = summary(TW)

Stat_Viva = summary(Viva)

```
> Stat_ESE = summary(ESE)
> Stat_CSE = summary(CSE_Mapped)
> Stat_IA = summary(IA)
> Stat_TW = summary(TW)
> Stat_Viva = summary(Viva)
> Stat_ESE
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.0    20.5    28.0    29.2    38.5    48.0
> Stat_ESE
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.0    20.5    28.0    29.2    38.5    48.0
> Stat_IA
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   4.00   17.00   23.00   20.98   26.75   30.00
> Stat_TW
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   0.00   17.00   19.50   18.89   22.00   25.00
>
> Stat_Viva
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   0.00   17.00   19.50   19.83   24.00   25.00
> |
```

7)

Highest = c(max(ESE) ,max(CSE_Mapped) , max(IA) , max(TW) , max(Viva))

ESE_Name = A$Student[which(ESE == Highest[1])]

CSE_Name = A$Student[which(CSE_Mapped == Highest[2])]

IA_Name = A$Student[which(IA == Highest[3])]

TW_Name = A$Student[which(TW == Highest[4])]

Viva_name = A$Student[which(Viva == Highest[5])]

print(paste("ESE-Tppper - ",ESE_Name))

print(paste("CSE-Tppper - ",CSE_Name))

print(paste("IA-Tppper - ",IA_Name))

print(paste("TW-Tppper - ",TW_Name))

print(paste("VIVA-Tppper - ",Viva_Name))

```
> print(paste("ESE-Tppper - ",ESE_Name))
[1] "ESE-Tppper -  V"  "ESE-Tppper -  Y"  "ESE-Tppper -  AF"
> print(paste("CSE-Tppper - ",CSE_Name))
[1] "CSE-Tppper -  B"  "CSE-Tppper -  Y"  "CSE-Tppper -  AF"
> print(paste("IA-Tppper - ",IA_Name))
[1] "IA-Tppper -  V"  "IA-Tppper -  Y"  "IA-Tppper -  AF"
> print(paste("TW-Tppper - ",TW_Name))
[1] "TW-Tppper -  M" "TW-Tppper -  N" "TW-Tppper -  W"
> print(paste("VIVA-Tppper - ",Viva_Name))
Error in paste("VIVA-Tppper - ", Viva_Name) :
  object 'Viva_Name' not found
>
```

8)

Total_Marks = ESE + CSE_Mapped + IA + TW + Viva

```
> Total_Marks
 [1]  94.32258 124.35484  98.32258  11.58065  82.61290 133.77419  91.96774  87.96774 126.41935
[10] 128.83871 108.90323  32.93548 115.12903 134.41935 100.90323 131.12903 121.77419  87.32258
[19]  45.58065 131.06452  72.45161 145.70968 120.19355  99.25806 146.35484  87.67742 107.61290
[28]  78.61290  79.90323 101.48387 136.83871 145.35484 103.61290  89.32258  28.93548  78.96774
[37]  91.67742 108.25806  90.96774 115.19355  78.32258 110.54839 140.70968 118.12903  99.96774
[46] 102.96774
>
```
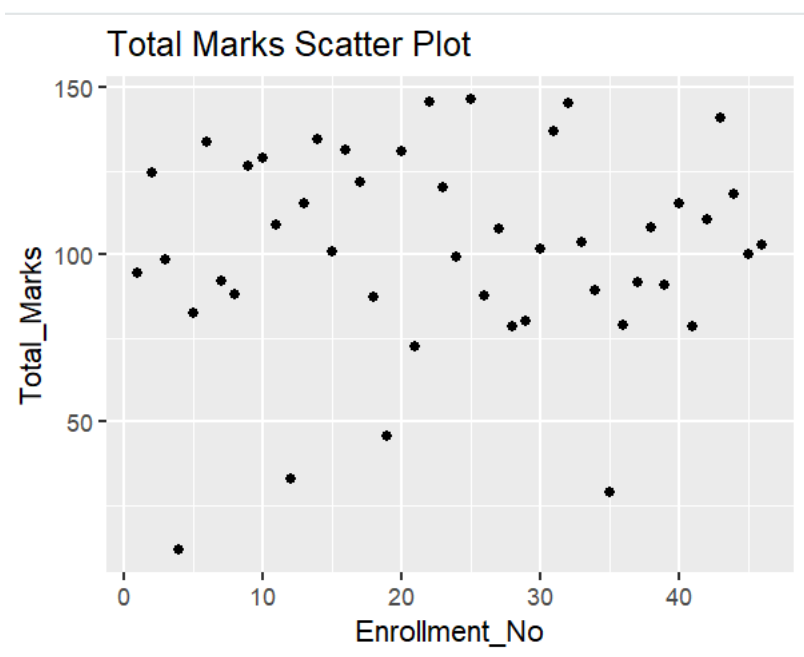
9)

Total_SP = data.frame(x = A$Enrollment , y = Total_Marks)

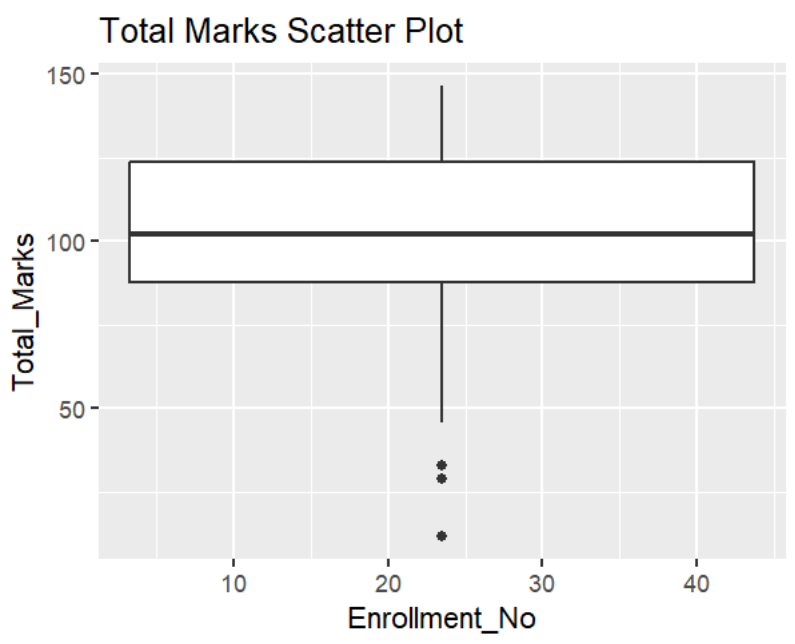
ggplot(Total_SP,aes(x = x ,y = y)) + geom_point(col = "black") +   labs(x = "Enrollment_No", y = "Total_Marks", title = "Total Marks Scatter Plot")

10)

ggplot(data=Total_SP, mapping=aes(x=x, y=y))+geom_boxplot() + labs(x = "Enrollment_No", y = "Total_Marks", title = "Total Marks Scatter Plot")

11)

Percentage = Total_Marks * 100 / 150

```
> Percentage = Total_Marks * 100 / 150
> Percentage
 [1] 62.88172 82.90323 65.54839  7.72043 55.07527 89.18280 61.31183 58.64516 84.27957 85.89247
[11] 72.60215 21.95699 76.75269 89.61290 67.26882 87.41935 81.18280 58.21505 30.38710 87.37634
[21] 48.30108 97.13978 80.12903 66.17204 97.56989 58.45161 71.74194 52.40860 53.26882 67.65591
[31] 91.22581 96.90323 69.07527 59.54839 19.29032 52.64516 61.11828 72.17204 60.64516 76.79570
[41] 52.21505 73.69892 93.80645 78.75269 66.64516 68.64516
> |
```

12)

Results = c(0,0,0,0,0)

for(i in 1:nrow(A)){

  if(Percentage[i] < 30){

    Results[1] = Results[1] + 1

  } else if (Percentage[i] >= 30 & Percentage[i] <= 50){

    Results[2] = Results[2] + 1

  }else if (Percentage[i] > 50 & Percentage[i] <= 70){

    Results[3] = Results[3] + 1

```r
    }else if (Percentage[i] > 70 & Percentage[i] <= 85){

      Results[4] = Results[4] + 1

    }else if (Percentage[i] > 85){

      Results[5] = Results[5] + 1

    }

}
```

```r
Results_Sp = data.frame(x = c("Percentage<30" , "30<=Percentage<=50" , "50<Percentage<=70" ,
"70<Percentage<=85" , "Percentage>85"), y = Results)
```
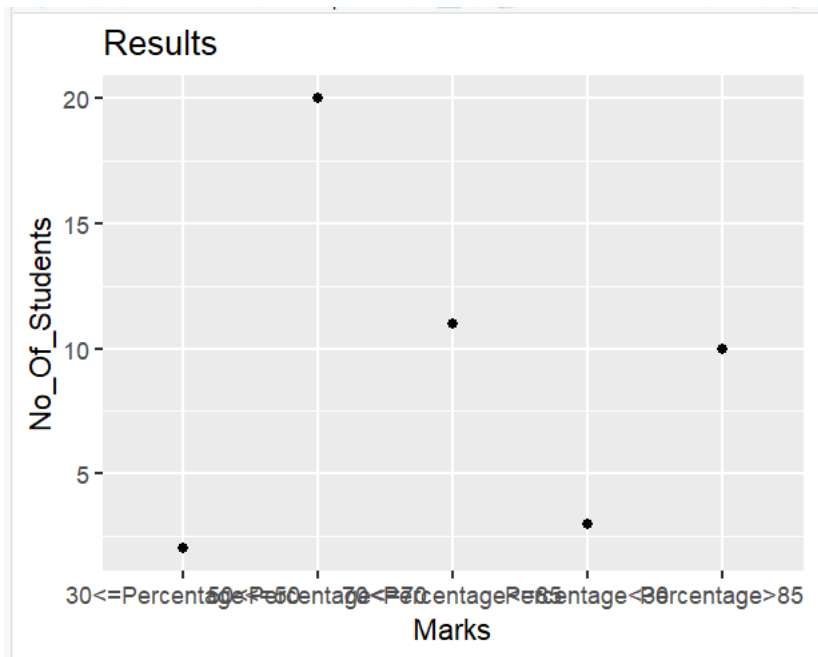
```r
ggplot(Results_Sp,aes(x = x ,y = y)) + geom_point(col = "black") +   labs(x = "Marks", y =
"No_Of_Students", title = "Results")
```


13)

```r
Grade = c()
```

```r
for(i in 1:nrow(A)){

  if(Percentage[i] >90){

    Grade = append(Grade,"O")

  } else if(Percentage[i]<=90 & Percentage[i]>80){

    Grade = append(Grade,"A+")
```

```r
}else if(Percentage[i]<=80 & Percentage[i]>70){

 Grade = append(Grade,"A")

}else if(Percentage[i]<=70 & Percentage[i]>60){

 Grade = append(Grade,"B+")

}else if(Percentage[i]<=60 & Percentage[i]>50){

 Grade = append(Grade,"B")

}else if(Percentage[i]<=50 & Percentage[i]>40){

 Grade = append(Grade,"C")

}else if(Percentage[i]<=40 & Percentage[i]>=33){

 Grade = append(Grade,"D")

}else if(Percentage[i]<33){

 Grade = append(Grade,"F")

 }

}
```

```
> Grade
 [1] "B+" "A+" "B+" "F"  "B"  "A+" "B+" "B"  "A+" "A+" "A"  "F"  "A"  "A+" "B+" "A+" "A+" "B"  "F"
[20] "A+" "C"  "O"  "A+" "B+" "O"  "B"  "A"  "B"  "B"  "B+" "O"  "O"  "B+" "B"  "F"  "B"  "B+" "A"
[39] "B+" "A"  "B"  "A"  "O"  "A"  "B+" "B+"
>
```

14)

```r
No_of_Stu = c(0,0,0,0,0,0,0,0)

for(i in 1:nrow(A)){

 if(Grade[i] == "O"){

  No_of_Stu[1] = No_of_Stu[1] + 1

 } else  if(Grade[i] == "A+"){

  No_of_Stu[2] = No_of_Stu[2] + 1

 } else  if(Grade[i] == "A"){

  No_of_Stu[3] = No_of_Stu[3] + 1

 }else  if(Grade[i] == "B+"){

  No_of_Stu[4] = No_of_Stu[4] + 1

 }else  if(Grade[i] == "B"){

  No_of_Stu[5] = No_of_Stu[5] + 1

 }else  if(Grade[i] == "C"){
```

```
    No_of_Stu[6] = No_of_Stu[6] + 1

  }else   if(Grade[i] == "D"){

    No_of_Stu[7] = No_of_Stu[7] + 1

  }else   if(Grade[i] == "F"){

    No_of_Stu[8] = No_of_Stu[8] + 1

  }

}


names_Grade = c("O" , "A+" ,"A" ,"B+" ,"B","C" ,"D","F")

Bar = data.frame(x = names_Grade , y = No_of_Stu )


ggplot(data = Bar, aes(x = x, y = y)) +

  geom_bar(stat = "identity") +

  labs(x = "Grade", y = "No_Of_Students", title = "Bar Graph")
```
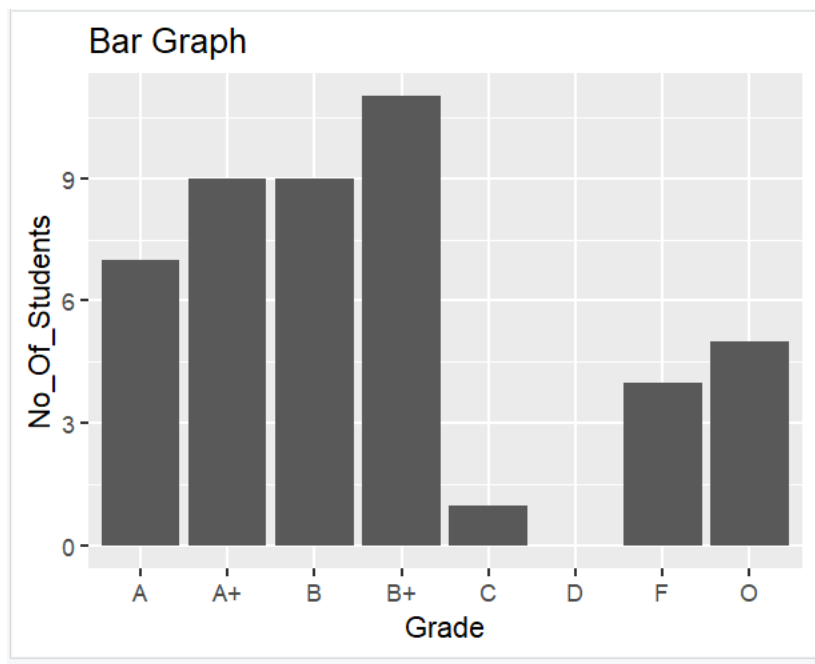

15)

High_Grade = names_Grade[which(No_of_Stu == max(No_of_Stu))]

```
> High_Grade = names_Grade[which(No_of_Stu == max(No_of_Stu))]
> High_Grade
[1] "B+"
>
```