MAT2001

FAT-LAB

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19BLC1186
Lab Number L70-71

Q1-Using R, create your own (Student Record) dataset and do the summary statistics and draw four graphs with interpretation. Use at least 10 observations with five variables.

Aim-To create student dataset and do the summary statistics and draw four graphs with interpretation in R-Studio

Code-

rollno=c(1,2,3,4,5,6,7,8,9,10)

rollno

stu_marks=c(100,99,97,100,40,60,30,20,0,100)

stu_marks

stu_gender=c(0,1,0,1,1,1,0,0,0,0) # here 0-Boy , 1-Girl

stu_gender

```
backlog=c(0,0,0,0,1,0,1,1,1,0) # here 0-no Backlog , 1-Backlog

backlog

no_of_backlogs=c(0,0,0,0,1,1,2,3,4,1) #number of backlog left

no_of_backlogs

stuinfo=data.frame(rollno,stu_marks,stu_gender,backlog,no_of_backlogs)

stuinfo

summary(stuinfo)

summary(stuinfo$stu_marks)

summary(stuinfo$stu_gender)

plot(stuinfo$stu_marks,type="l",main = "Marks of Students",xlab = "Roll Number",ylab="Marks",col="blue")

plot(stu_marks,backlog, main = "Backlog of Students", xlab = "Student Marks", ylab = "Backlog",col="red")

plot(rollno,no_of_backlogs,main="Number of Backlogs",xlab = "Roll
```

```
Number",ylab="Number of Backlogs"   ,col =
"purple")

plot(stuinfo$stu_gender,type="l",main =
"Gender of Students",xlab = "Roll
Number",ylab="Student Gender",col="blue")
```

Output-

```
> rollno=c(1,2,3,4,5,6,7,8,9,10)

> rollno

 [1]  1  2  3  4  5  6  7  8  9 10

> stu_marks=c(100,99,97,100,40,60,30,20,0,100)

> stu_marks

 [1] 100  99  97 100  40  60  30  20   0 100

> stu_gender=c(0,1,0,1,1,1,0,0,0,0) # here 0-Boy ,
1-Girl

> stu_gender

 [1] 0 1 0 1 1 1 0 0 0 0

> backlog=c(0,0,0,0,1,0,1,1,1,0) # here 0-no
Backlog , 1-Backlog
```

> backlog

[1] 0 0 0 0 1 0 1 1 1 0

> no_of_backlogs=c(0,0,0,0,1,1,2,3,4,1) #number of backlog left

> no_of_backlogs

[1] 0 0 0 0 1 1 2 3 4 1

>
stuinfo=data.frame(rollno,stu_marks,stu_gender,backlog,no_of_backlogs)

> stuinfo

rollno	stu_marks	stu_gender	backlog	no_of_backlogs
1	100	0	0	0
2	99	1	0	0
3	97	0	0	0
4	100	1	0	0
5	40	1	1	1
6	60	1	0	1
7	30	0	1	2

8 8 20 0 1 3

9 9 0 0 1 4

10 10 100 0 0 1

> summary(stuinfo)

rollno stu_marks stu_gender backlog no_of_backlogs

Min. : 1.00 Min. : 0.00 Min. :0.0 Min. :0.0 Min. :0.00

1st Qu.: 3.25 1st Qu.: 32.50 1st Qu.:0.0 1st Qu.:0.0 1st Qu.:0.00

Median : 5.50 Median : 78.50 Median :0.0 Median :0.0 Median :1.00

Mean : 5.50 Mean : 64.60 Mean :0.4 Mean :0.4 Mean :1.20

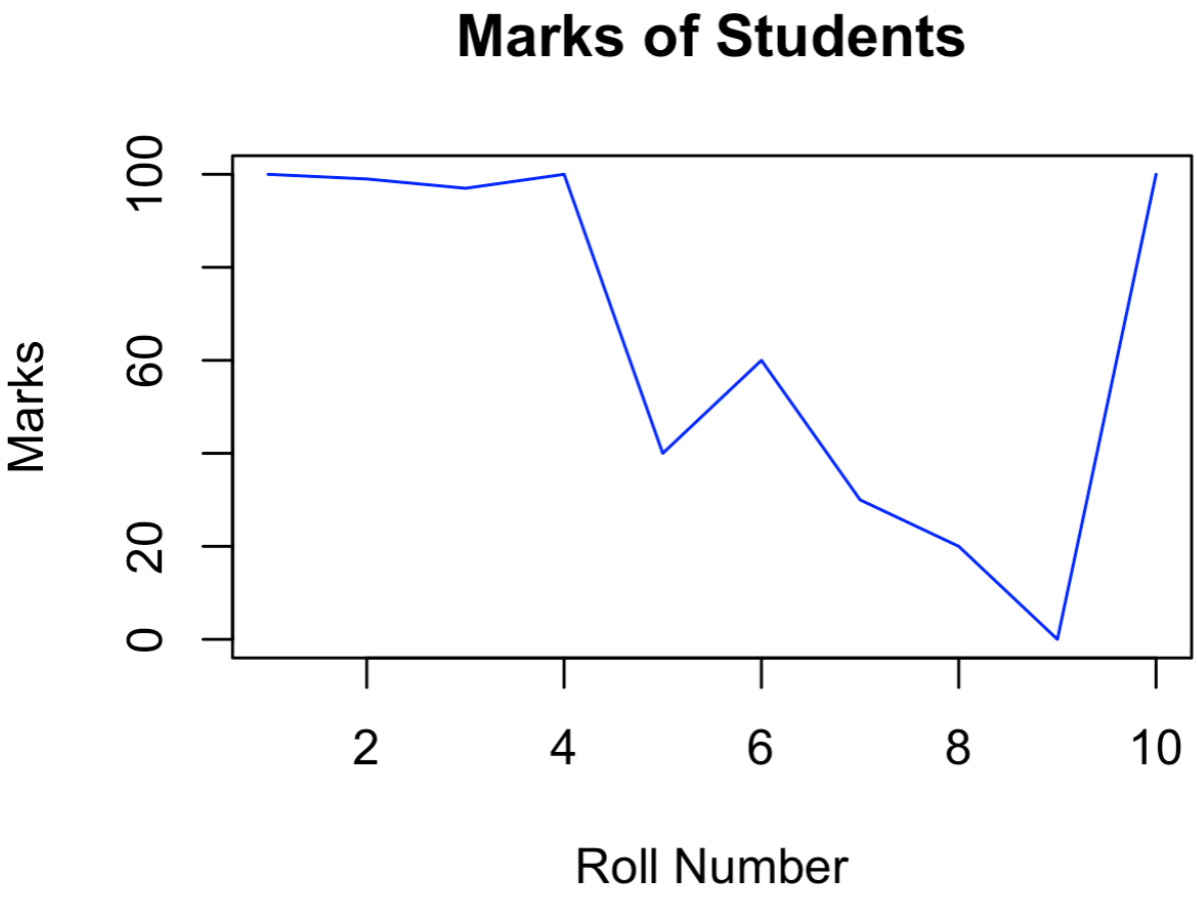
3rd Qu.: 7.75 3rd Qu.: 99.75 3rd Qu.:1.0 3rd Qu.:1.0 3rd Qu.:1.75

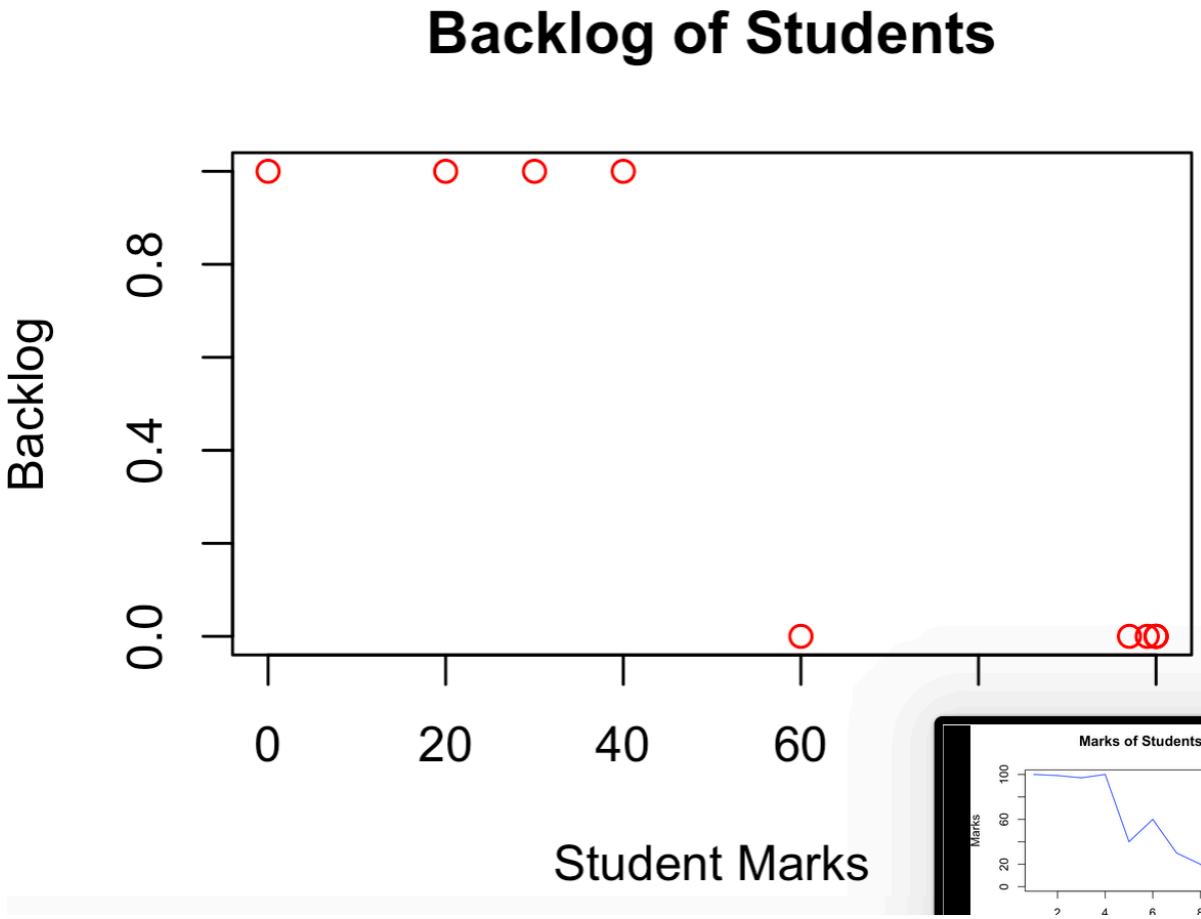
Max. :10.00 Max. :100.00 Max. :1.0 Max. :1.0 Max. :4.00

> summary(stuinfo$stu_marks)

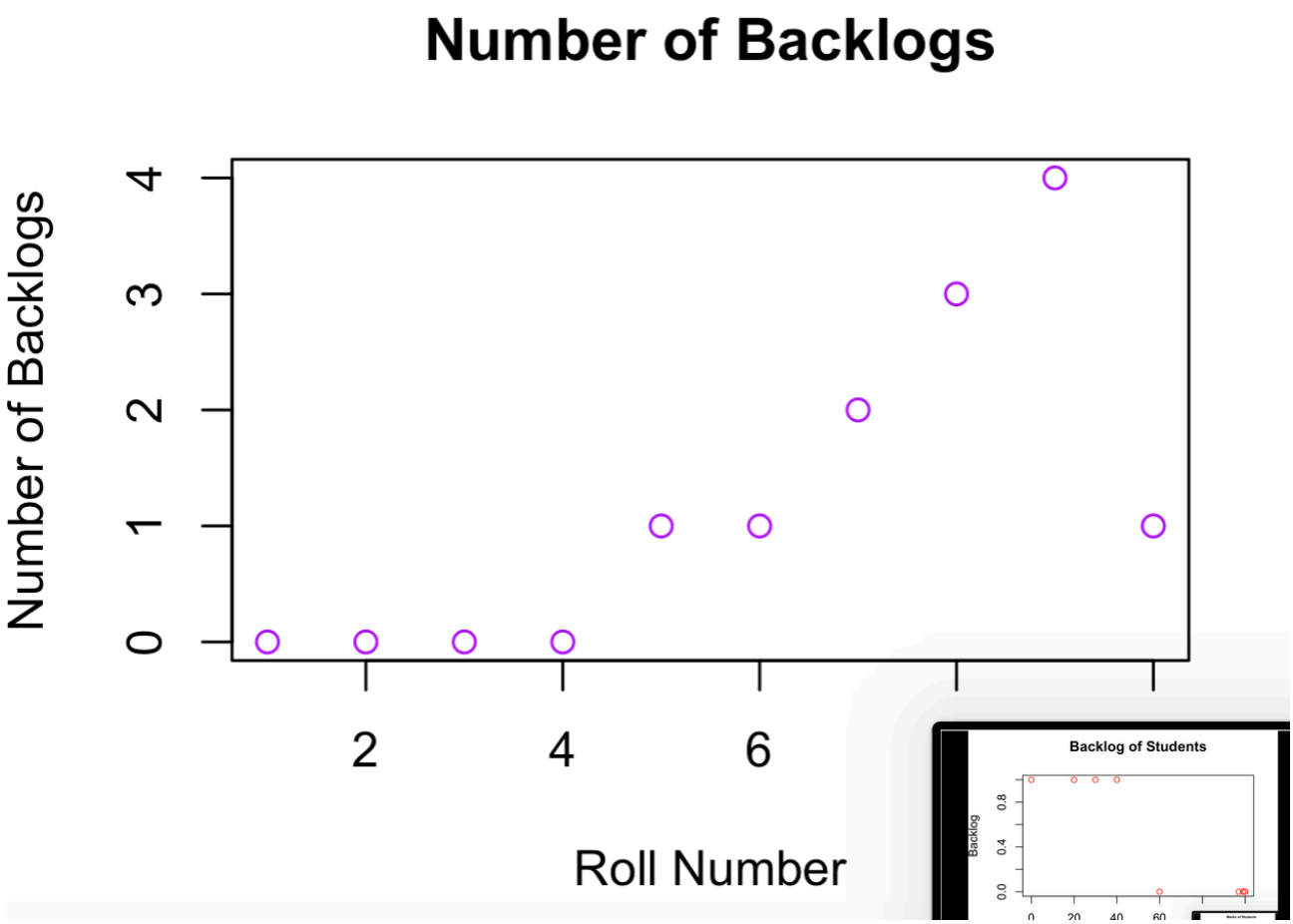
Min. 1st Qu. Median Mean 3rd Qu. Max.

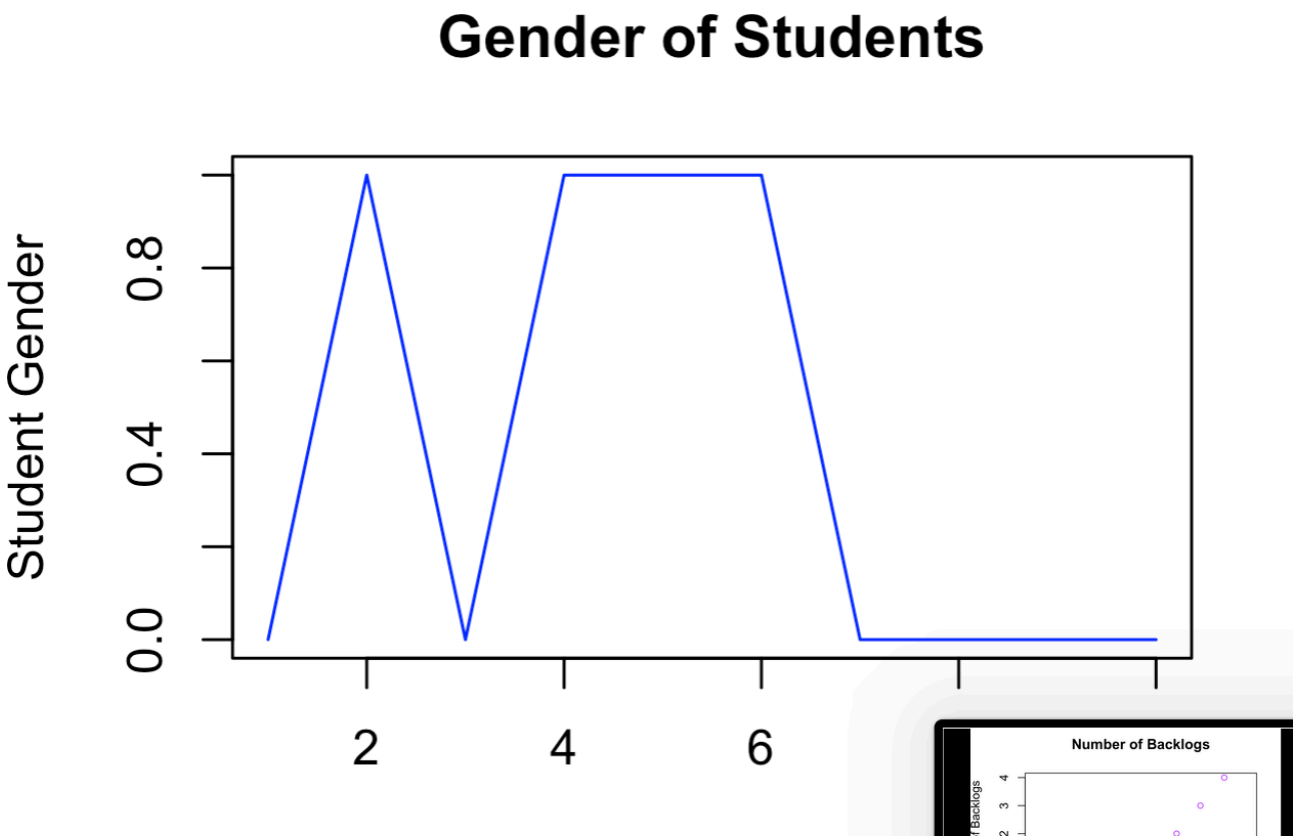
```
   0.00   32.50   78.50   64.60   99.75  100.00

> summary(stuinfo$stu_gender)

   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.

    0.0     0.0     0.0     0.4     1.0     1.0

> plot(stuinfo$stu_marks,type="l",main =
"Marks of Students",xlab = "Roll
Number",ylab="Marks",col="blue")

> plot(stu_marks,backlog, main = "Backlog of
Students", xlab = "Student Marks", ylab =
"Backlog",col="red")

> plot(rollno,no_of_backlogs,main="Number of
Backlogs",xlab = "Roll
Number",ylab="Number of Backlogs"   ,col =
"purple")

> plot(stuinfo$stu_gender,type="l",main =
"Gender of Students",xlab = "Roll
Number",ylab="Student Gender”,col="blue")
```


Marks of Students
Marks
0
20
60
100
2
4
6
8
10
Roll Number


Backlog of Students
Backlog
0.0
0.4
0.8
0
20
40
60
Student Marks

Marks of Students
Marks
0
20
60
100


Number of Backlogs
Number of Backlogs
0
1
2
3
4
2
4
6
Roll Number
Backlog of Students
Backlog
0.0
0.4
0.8
0
20
40
60


Gender of Students
Student Gender
0.0
0.4
0.8
2
4
6
Number of Backlogs

Q2 The breaking strengths of cables produced by manufacturer have a mean of 1800 Kg and a standard deviation of 100 Kg. by a new technique in the manufacturing process, it is claimed that breaking strength can be increased. To test this claim, a sample of 50 cables is tested and it is found that the mean breaking strength is 1850Kg. Using R programming can we support the claim at the 1% significance level?

Aim-To Study Testing of Hypothesis

Code-

```
alpha=0.01

x1bar=1850

x2bar=1800

sd1=100

sd2=sqrt(50)

t=abs(x1bar-x2bar)/(sqrt((sd1^2/n1)+sd2^2/n2))

tv=qt(1-(alpha/2),n1+n2-2)

t
```

tv

Output-

> alpha=0.01

> x1bar=1850

> x2bar=1800

> sd1=100

> sd2=sqrt(50)

> t=abs(x1bar-x2bar)/(sqrt((sd1^2/n1)+sd2^2/n2))

> tv=qt(1-(alpha/2),n1+n2-2)

> t

[1] 1.115249

> tv

[1] 3.355387

Result- We reject Ho and we conclude that a new technique can improve the break strength.