R Notebook-CLASS-1

Try executing this chunk by clicking the *Run* button within the chunk or by placing your cursor inside it and pressing *Ctrl+Shift+Enter*.

```
31*78
```

Add a new chunk by clicking the *Insert Chunk* button on the toolbar or by pressing *Ctrl+Alt+I*.

When you save the notebook, an HTML file containing the code and output will be saved alongside it (click the *Preview* button or press *Ctrl+Shift+K* to preview the HTML file).

The preview shows you a rendered HTML copy of the contents of the editor. Consequently, unlike *Knit*, *Preview* does not run any R code chunks. Instead, the output of the chunk when it was last run in the editor is displayed.

Ex-1

```
a <- 5*3
a
```

```
## [1] 15
```

```
help(log)
```

```
## starting httpd help server ... done
```

```
a<-1
b<- (-6)
c<-1
s1<- (-b+sqrt(b^2 - 4*a*c))/(2*a)
s2<- (-b-sqrt(b^2 - 4*a*c))/(2*a)
print(s1)
```

```
## [1] 5.828427
```

```
print(s2)
```

```
## [1] 0.1715729
```

Vectros

```
vector1<- c(1,2,3)
vector1
```

```
## [1] 1 2 3
```

```
class(vector1)
```

```
## [1] "numeric"
```

```
vect2<- c('i','n','d','i','a')
vect2
```

```
## [1] "i" "n" "d" "i" "a"
```

```
class(vect2)
```

```
## [1] "character"
```

```
vect3<-c(1,2,'i','p')
vect3
```

```
## [1] "1" "2" "i" "p"
```

```
class(vect3)
```

```
## [1] "character"
```

```
vect4<-c("italy"=10,"canada"=20,"usa"=30 )
vect4
```

```
##  italy canada    usa
##     10     20     30
```

```
class(vect4)
```

```
## [1] "numeric"
```

```
seq(1,10)
```

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

```
1:5
```

```
## [1] 1 2 3 4 5
```

```
names(vect4)
```

```
## [1] "italy"  "canada" "usa"
```

```
vect4["italy"]
```

```
## italy
##    10
```

```
vect4[2]
```

```
## canada
##     20
```

```
vect4[1:3]
```

```
##  italy canada    usa
##     10     20     30
```

```
vect4[c(1,3)]
```

```
## italy   usa
##    10    30
```

```
a<- c(1,"canada",2)
class(a)
```

```
## [1] "character"
```

```
vect3<-c(1,2,'i','v')
class(vect3)
```

```
## [1] "character"
```

```
x<- 1:10
x
```

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

```
y<- as.character(x)
y
```

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

```
as.numeric(y)
```

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

matrix

```
mat<- matrix(1:12,nrow = 4,ncol = 3)
mat
```

```
##      [,1] [,2] [,3]
## [1,]    1    5    9
## [2,]    2    6   10
## [3,]    3    7   11
## [4,]    4    8   12
```

```
mat[2,2]
```

```
## [1] 6
```

```
mat[2,]
```

```
## [1]  2  6 10
```

```
mat[,3]
```

```
## [1]  9 10 11 12
```

```
mat[,2:3]
```

```
##      [,1] [,2]
## [1,]    5    9
## [2,]    6   10
## [3,]    7   11
## [4,]    8   12
```

```
mat[1,2:3]
```

```
## [1] 5 9
```

```
as.data.frame(mat)
```

V1 <int>	V2 <int>	V3 <int>
1	5	9

V1	V2	V3
<int>	<int>	<int>
2	6	10
3	7	11
4	8	12

4 rows

list

```
list1=list(1,2,3)
list1
```

```
## [[1]]
## [1] 1
##
## [[2]]
## [1] 2
##
## [[3]]
## [1] 3
```

```
mylist1=list(name="prabal",degree="msc",course="dsai")
mylist1
```

```
## $name
## [1] "prabal"
##
## $degree
## [1] "msc"
##
## $course
## [1] "dsai"
```

```
out=t.test(1:10,c(7:20))
out
```

```
##
##  Welch Two Sample t-test
##
## data:  1:10 and c(7:20)
## t = -5.4349, df = 21.982, p-value = 1.855e-05
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -11.052802  -4.947198
## sample estimates:
## mean of x mean of y
##       5.5      13.5
```

```
a<-c(1,2,3,4)
b<-c("d","e","f","g")
c<-c("hi","bp","np","gh")
df<-data.frame(a,b,c)
df
```

	a <dbl>	b <chr>	c <chr>
	1	d	hi
	2	e	bp
	3	f	np
	4	g	gh

4 rows

```
df[1:3,1:2]
```

	a <dbl>	b <chr>
1	1	d
2	2	e
3	3	f

3 rows

```
df[1,2]
```

```
## [1] "d"
```

```
df[1,]
```

	a <dbl>	b <chr>	c <chr>
1	1	d	hi

1 row

```
df[,3]
```

```
## [1] "hi" "bp" "np" "gh"
```

```
new_c1<- c("kol","hol","jol","pol")
df$city<- new_c1
df
```

	a	b	c	city
	<dbl>	<chr>	<chr>	<chr>
	1	d	hi	kol
	2	e	bp	hol
	3	f	np	jol
	4	g	gh	pol

4 rows

```
subset(df,a>2)
```

	a	b	c	city
	<dbl>	<chr>	<chr>	<chr>
3	3	f	np	jol
4	4	g	gh	pol

2 rows

Import Library

```
library(dslabs)
data(murders)
class(murders)
```

```
## [1] "data.frame"
```

```
str(murders)
```

```
## 'data.frame':    51 obs. of  5 variables:
##  $ state     : chr  "Alabama" "Alaska" "Arizona" "Arkansas" ...
##  $ abb       : chr  "AL" "AK" "AZ" "AR" ...
##  $ region    : Factor w/ 4 levels "Northeast","South",..: 2 4 4 2 4 4 1 2 2 2 ...
##  $ population: num  4779736 710231 6392017 2915918 37253956 ...
##  $ total     : num  135 19 232 93 1257 ...
```

```
head(murders)
```

	state	abb	region	population	total
	<chr>	<chr>	<fct>	<dbl>	<dbl>
1	Alabama	AL	South	4779736	135
2	Alaska	AK	West	710231	19
3	Arizona	AZ	West	6392017	232
4	Arkansas	AR	South	2915918	93

	state <chr>	abb <chr>	region <fct>	population <dbl>	total <dbl>
5	California	CA	West	37253956	1257
6	Colorado	CO	West	5029196	65

6 rows

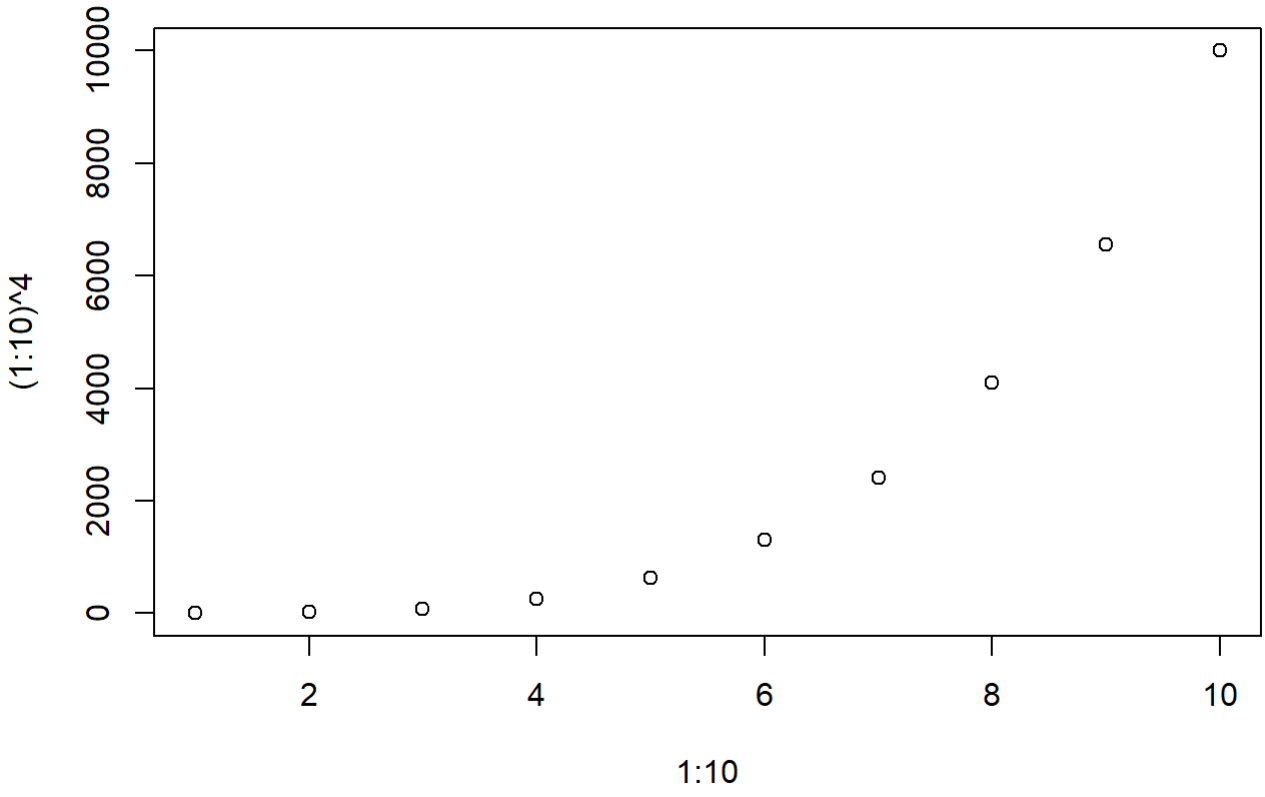
```
names(murders)
```

```
## [1] "state"      "abb"        "region"     "population" "total"
```

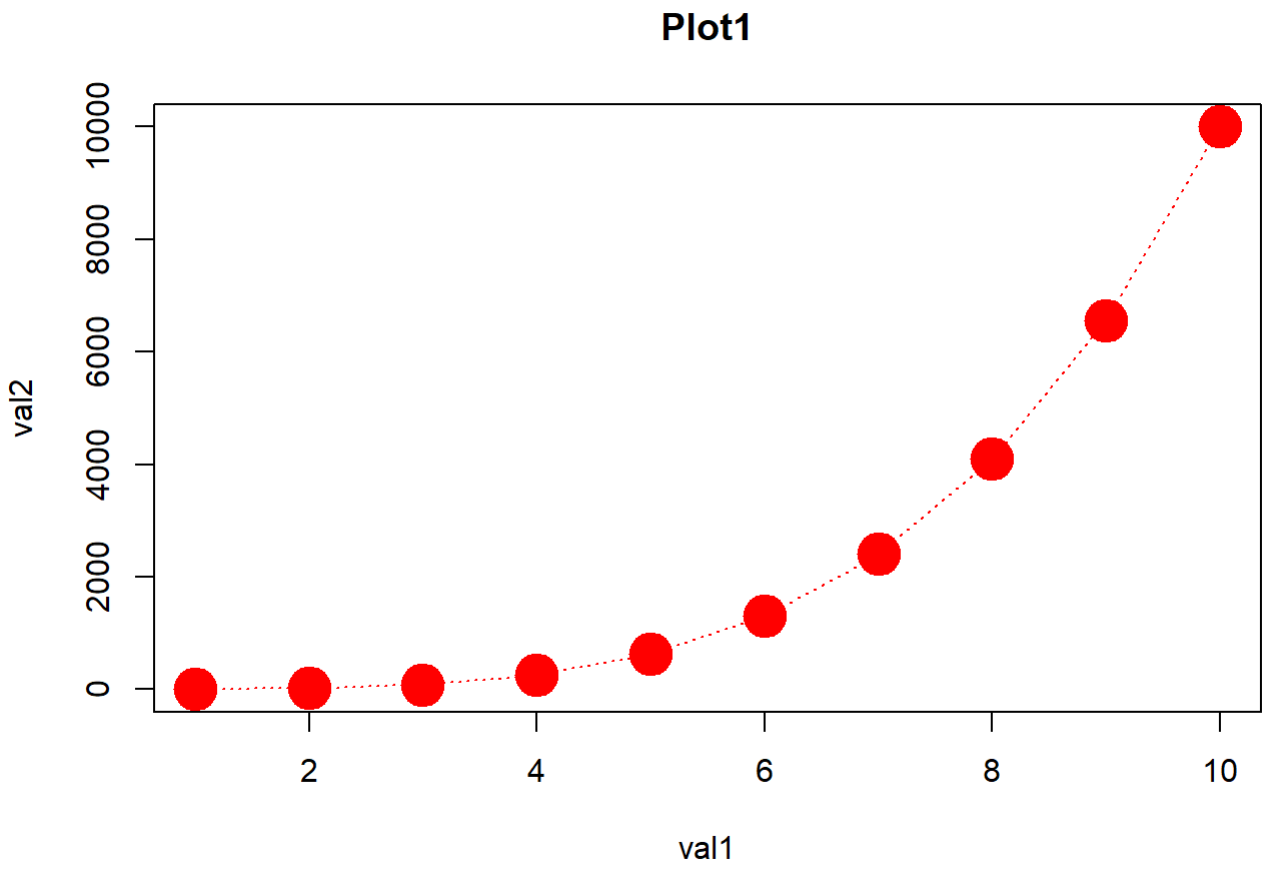
```
murders$population
```

```
##  [1]  4779736   710231  6392017  2915918 37253956  5029196  3574097   897934
##  [9]   601723 19687653  9920000  1360301  1567582 12830632  6483802  3046355
## [17]  2853118  4339367  4533372  1328361  5773552  6547629  9883640  5303925
## [25]  2967297  5988927   989415  1826341  2700551  1316470  8791894  2059179
## [33] 19378102  9535483   672591 11536504  3751351  3831074 12702379  1052567
## [41]  4625364   814180  6346105 25145561  2763885   625741  8001024  6724540
## [49]  1852994  5686986   563626
```

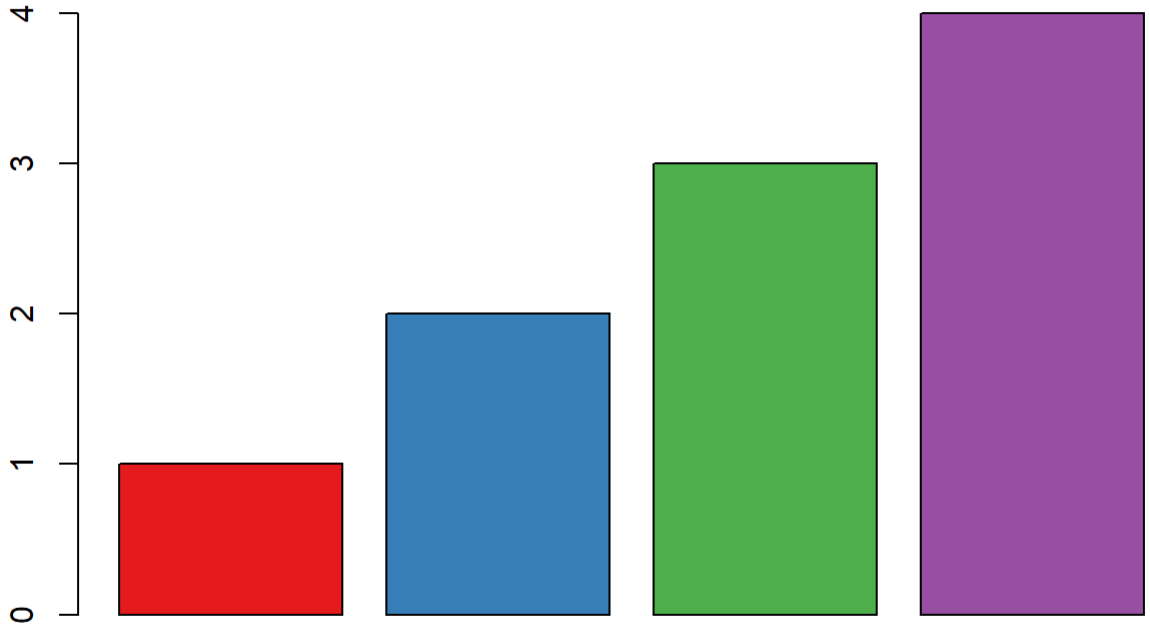
```
plot(1:10,(1:10)^4)
```



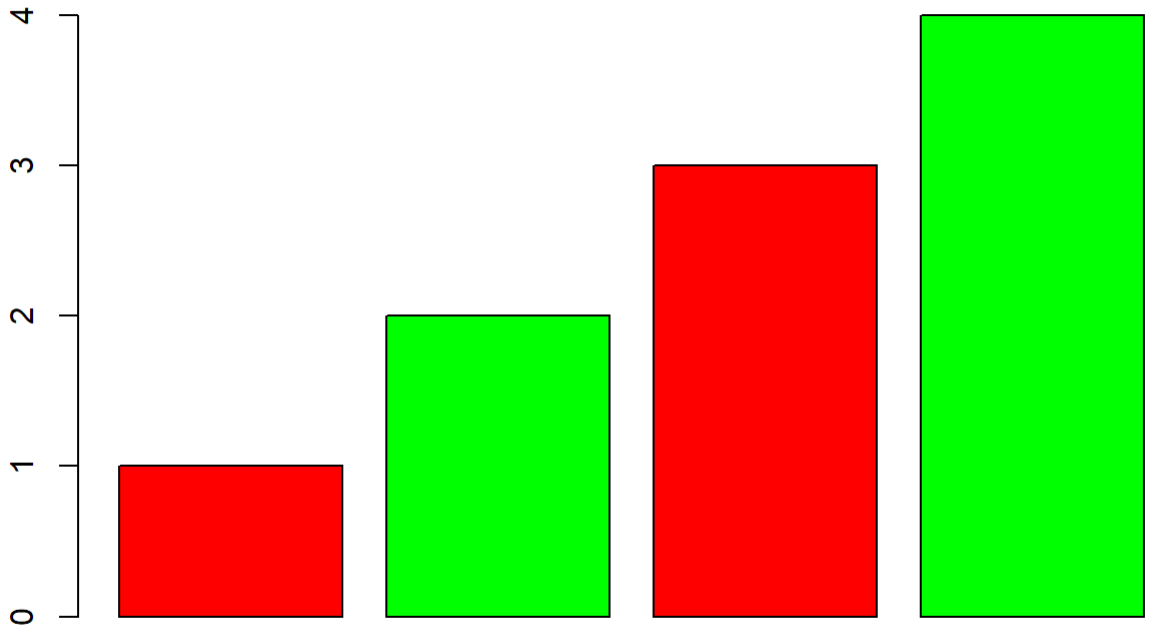
```
plot(1:10,(1:10)^4,xlab = 'val1',ylab = 'val2',pch=19,type = 'b',col='red',main = "Plot1",cex
=3,lty=3)
```




```
library(RColorBrewer)
barplot(1:4,col=brewer.pal(4,"Set1"))
```

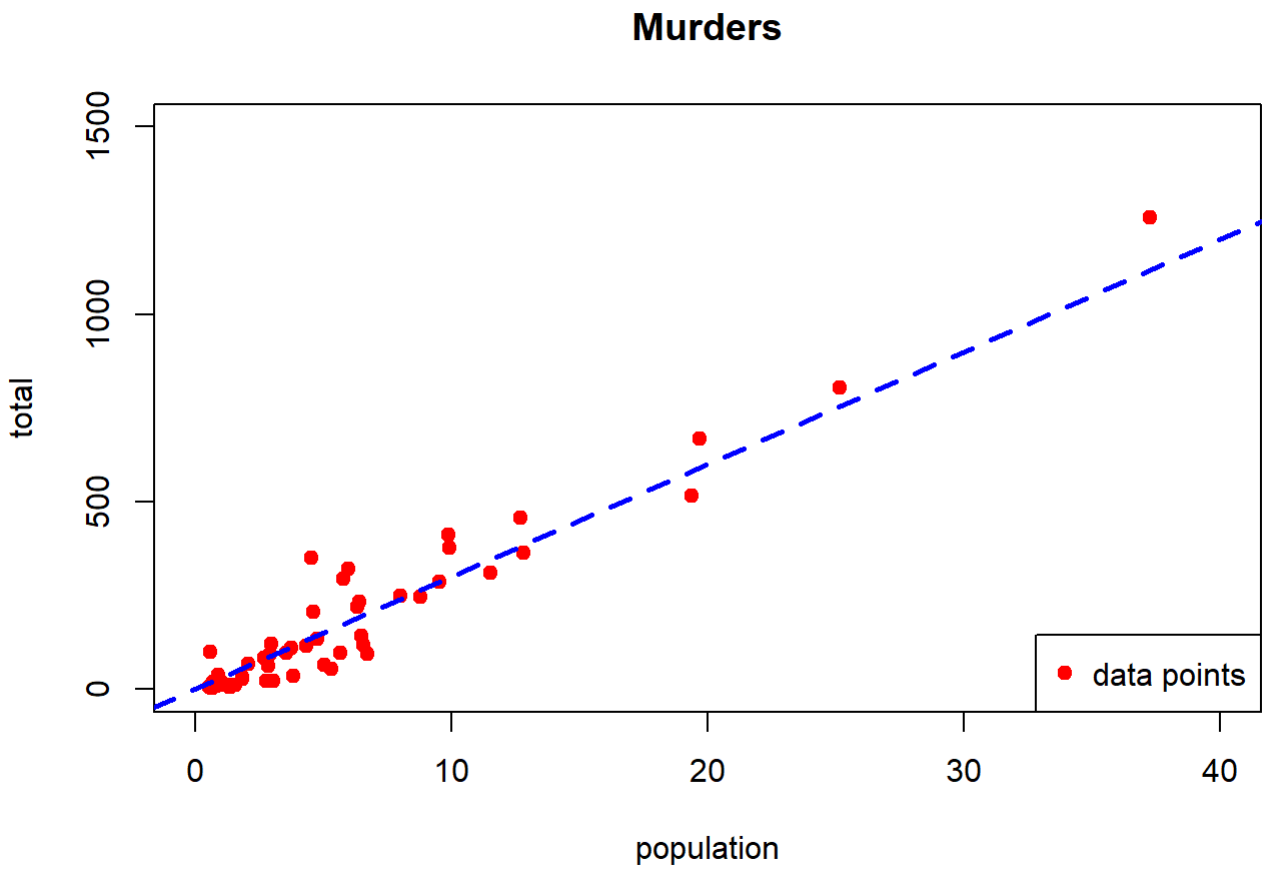



```
barplot(1:4,col=c("red","green"))
```



Scatter plot

```
x<- murders$population/10^6
y<- murders$total
plot(x,y,xlim = c(0,40), ylim =c(0,1500),pch=19,xlab = 'population',ylab = 'total',col='red',
main = "Murders")
legend("bottomright",legend = "data points",pch=19,col = "red")
abline(a=0,b=30,lty=2,lwd=2.5,col=("blue"))
```



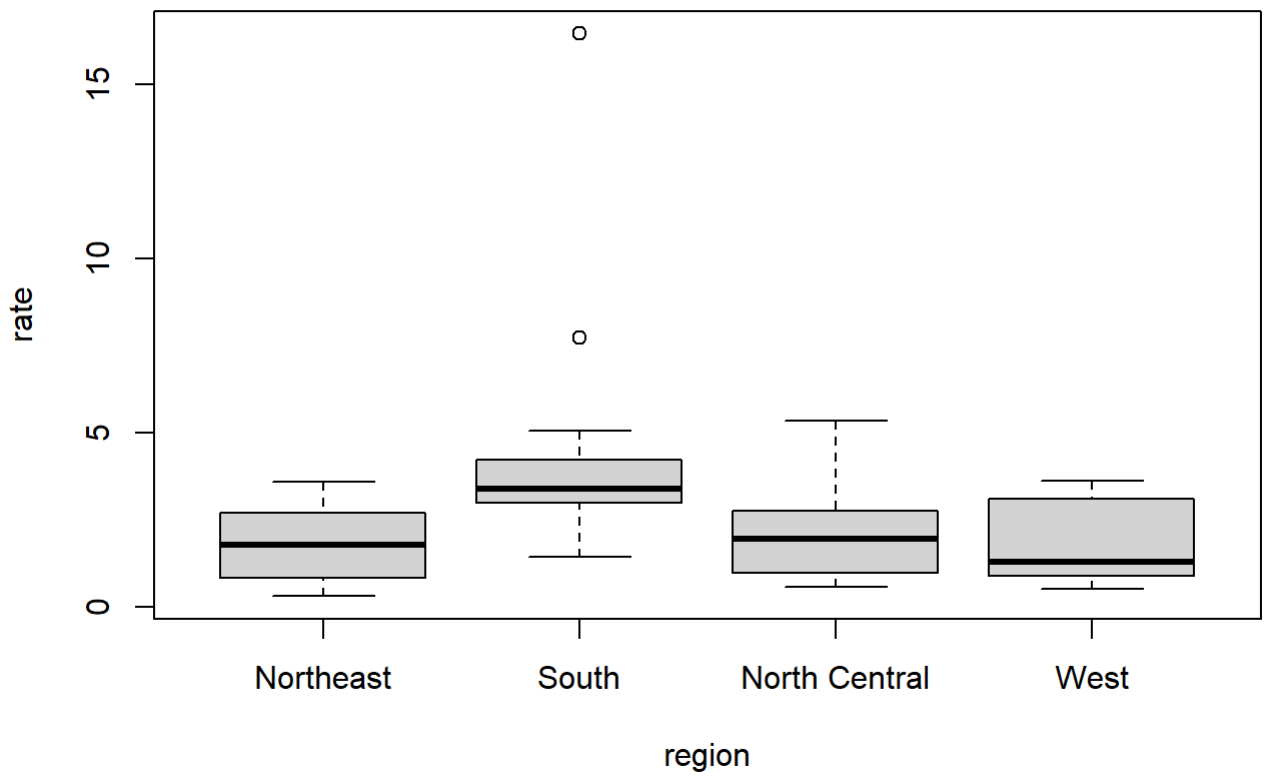
BOX PLOT

```
murders$rate<- with(murders,total/population * 100000)
head(murders)
```

	state <chr>	abb <chr>	region <fct>	population <dbl>	total <dbl>	rate <dbl>
1	Alabama	AL	South	4779736	135	2.824424
2	Alaska	AK	West	710231	19	2.675186
3	Arizona	AZ	West	6392017	232	3.629527
4	Arkansas	AR	South	2915918	93	3.189390
5	California	CA	West	37253956	1257	3.374138
6	Colorado	CO	West	5029196	65	1.292453

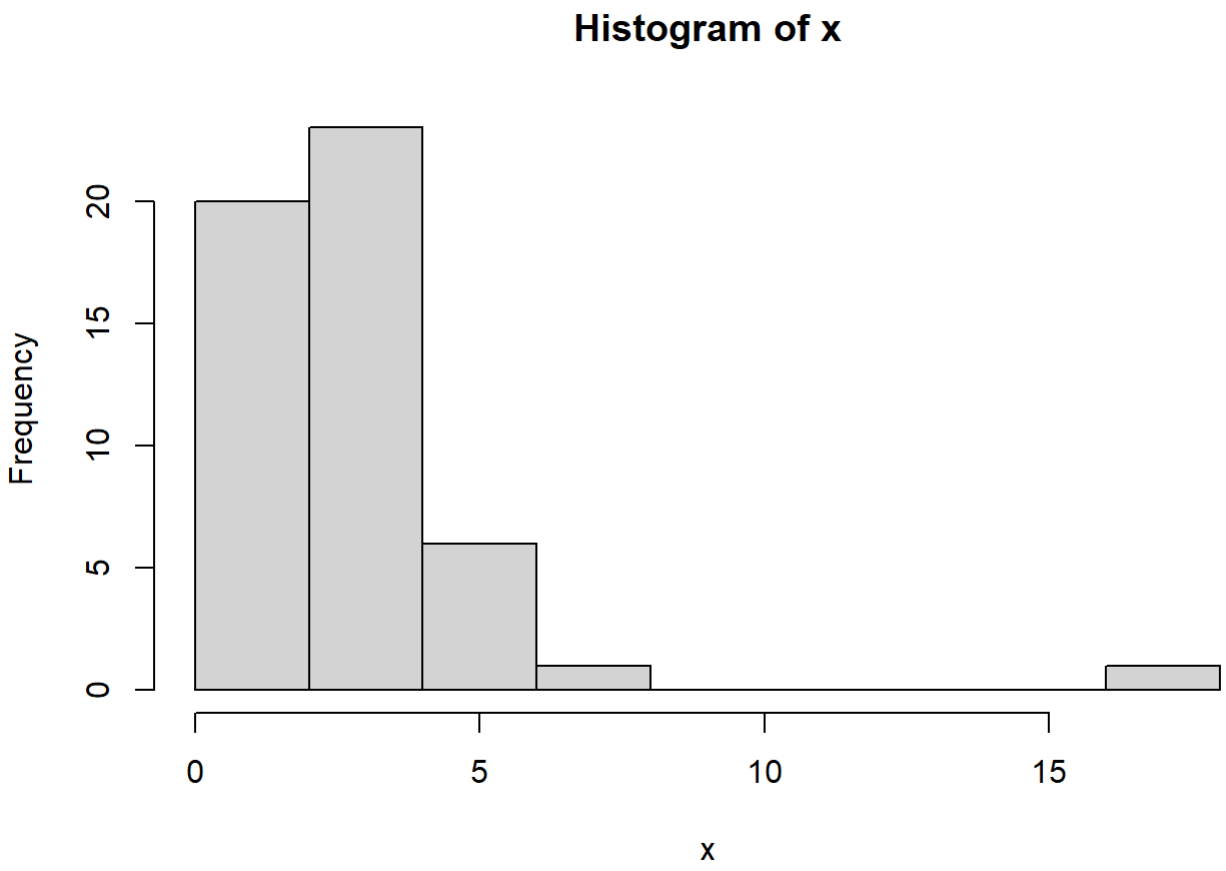
6 rows

```
boxplot(rate~region, data = murders)
```



Histogram

```
x<- with(murders,total/population * 100000)
hist(x)
```



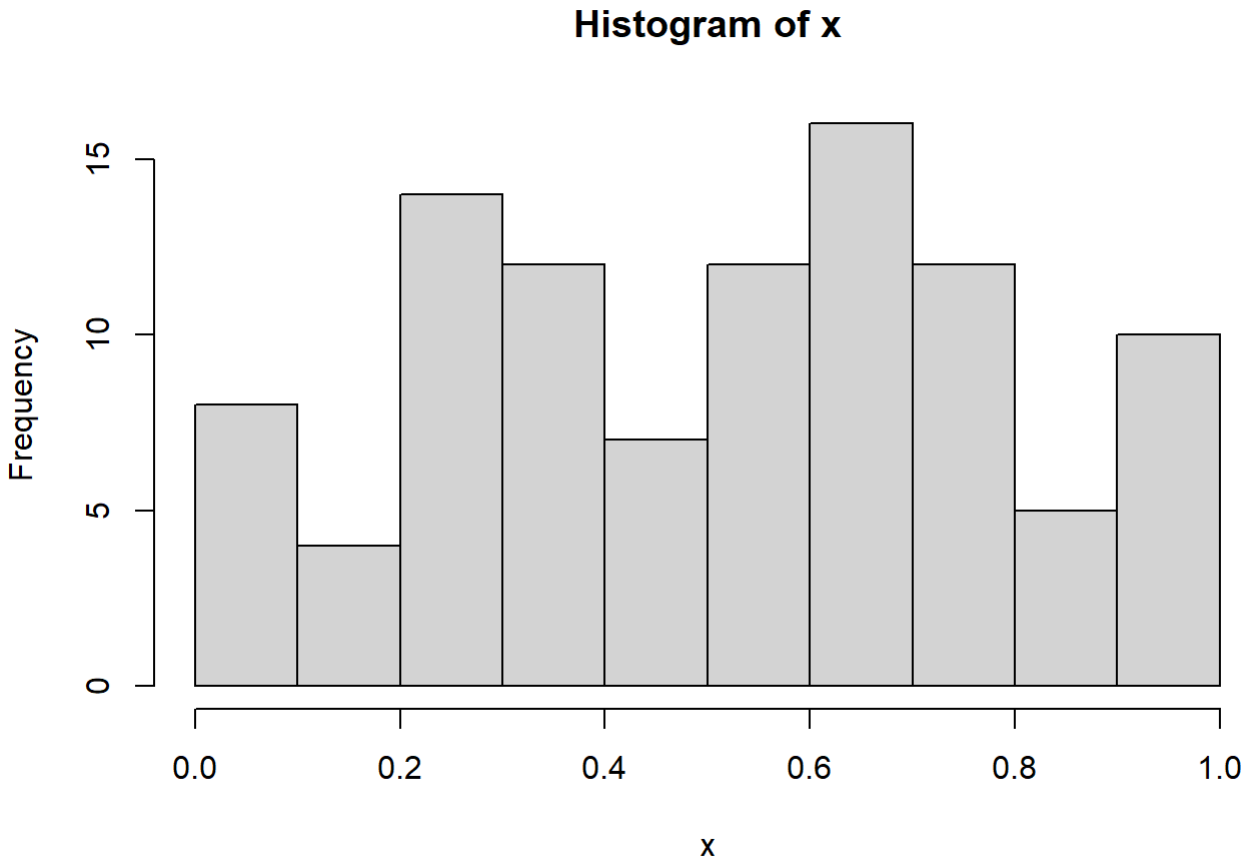

```
murders$state[which.max(x)]
```

```
## [1] "District of Columbia"
```

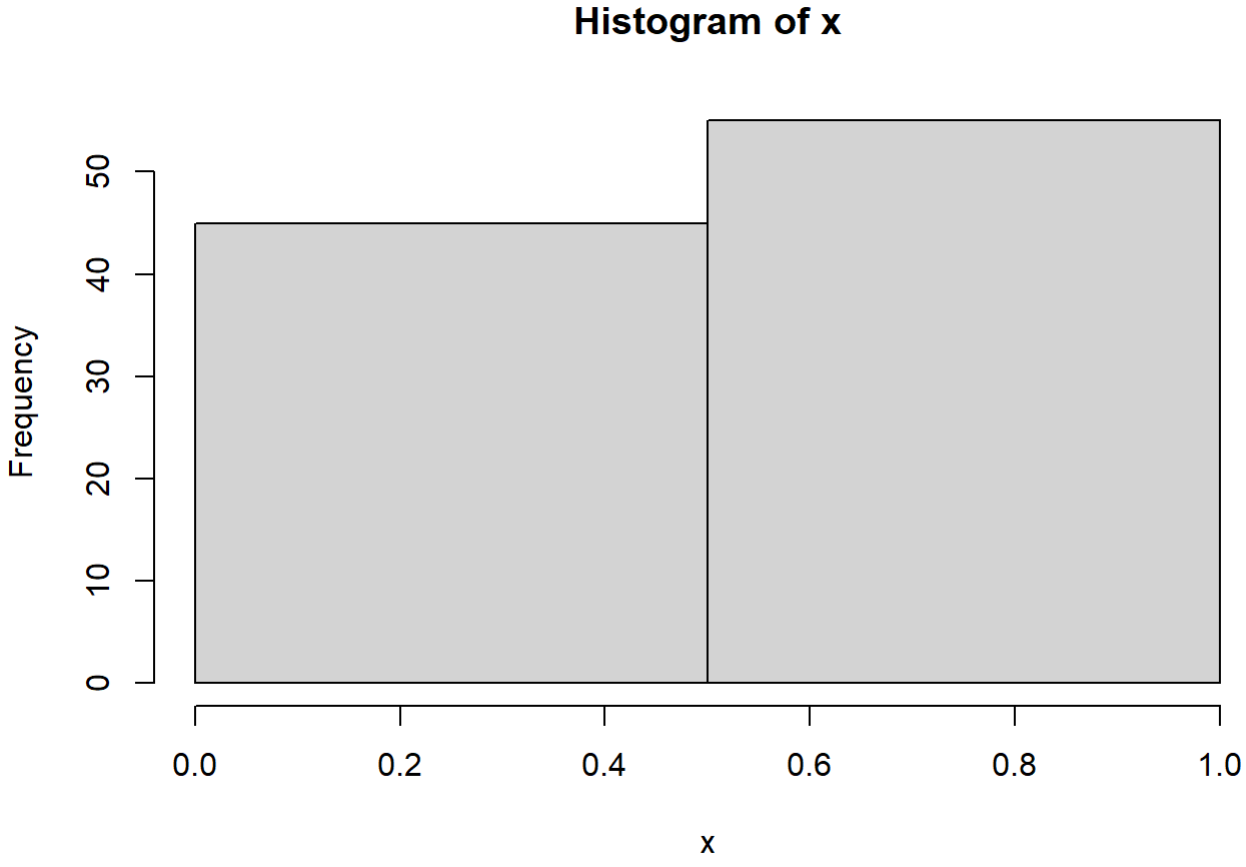
```
x= runif(100,0,1)
par(mflow=c(1,2))
```

```
## Warning in par(mflow = c(1, 2)): "mflow" is not a graphical parameter
```

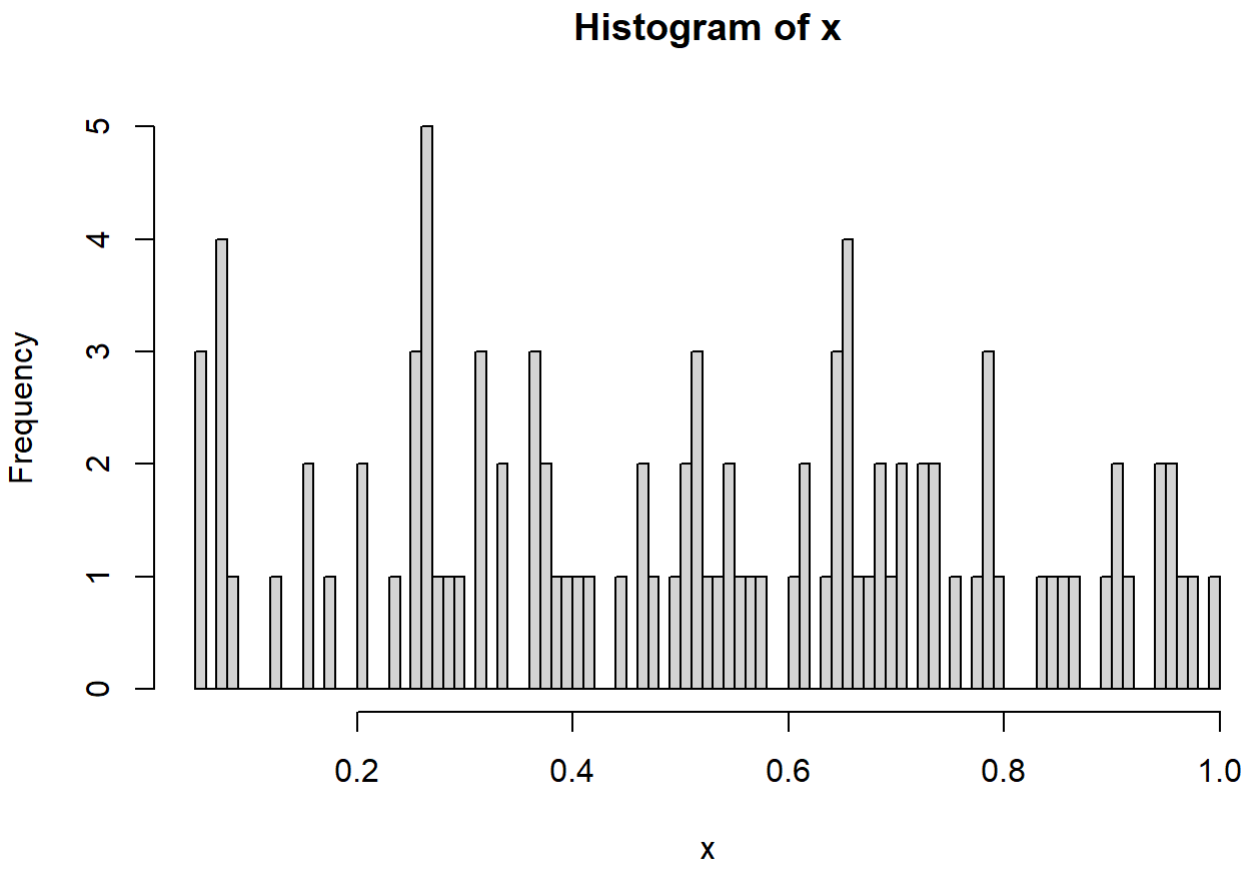
```
hist(x)
```




```
hist(x, breaks=2)
```



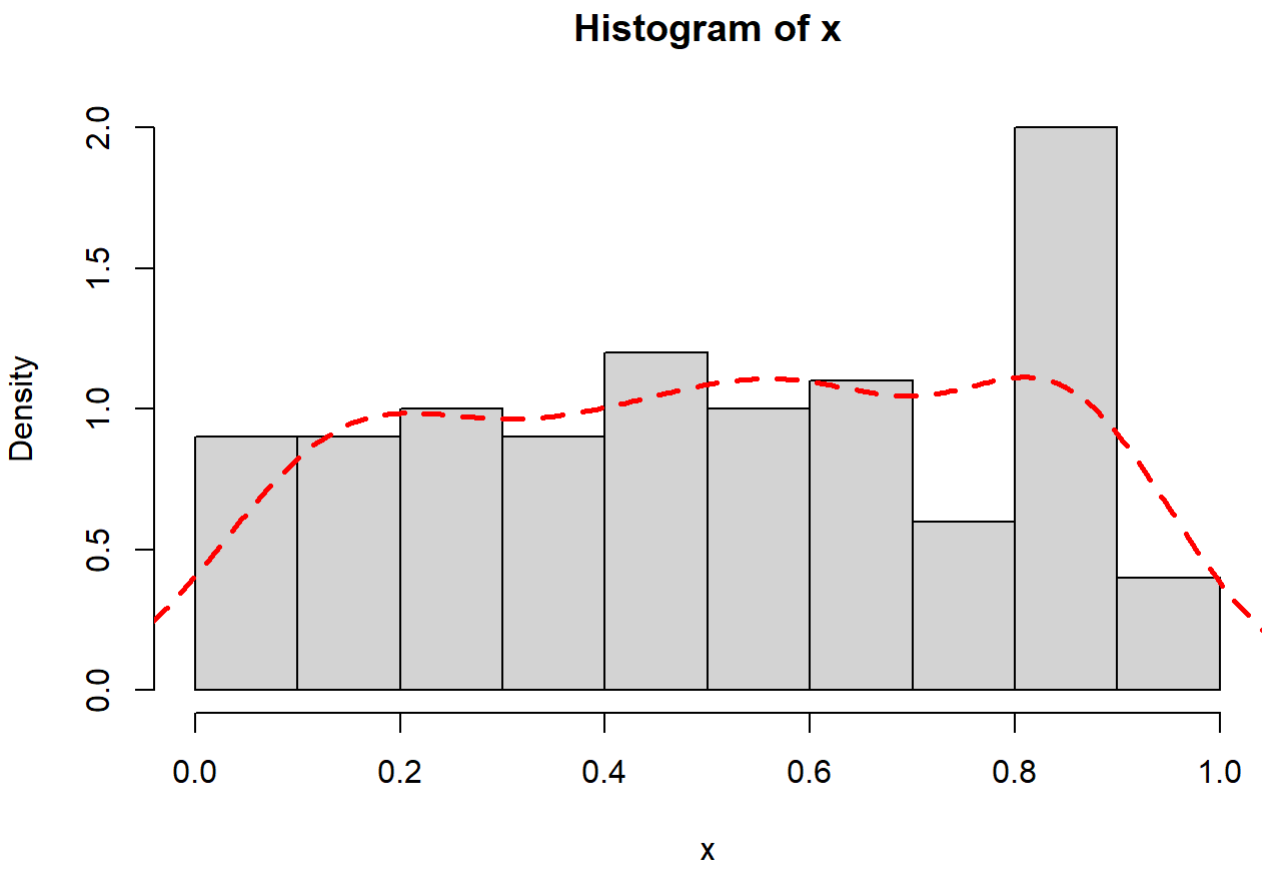
```
hist(x, breaks=100)
```



Density plot

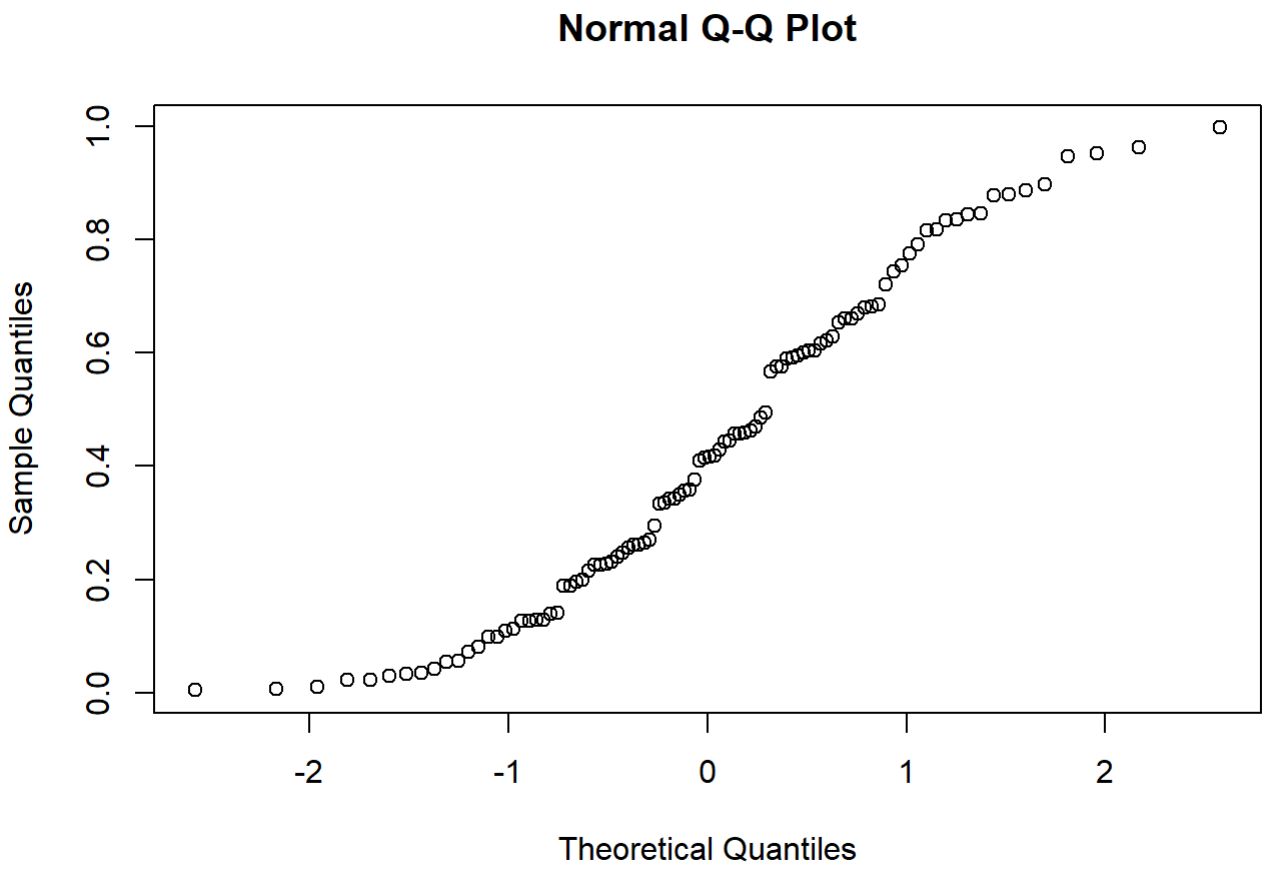
```
x= runif(100,0,1)

hist(x, freq = FALSE)
# hist(x, breaks=2)
# hist(x, breaks=100)
f=density(x)
lines(f,col="red",lty=2,lwd=2.5)
```



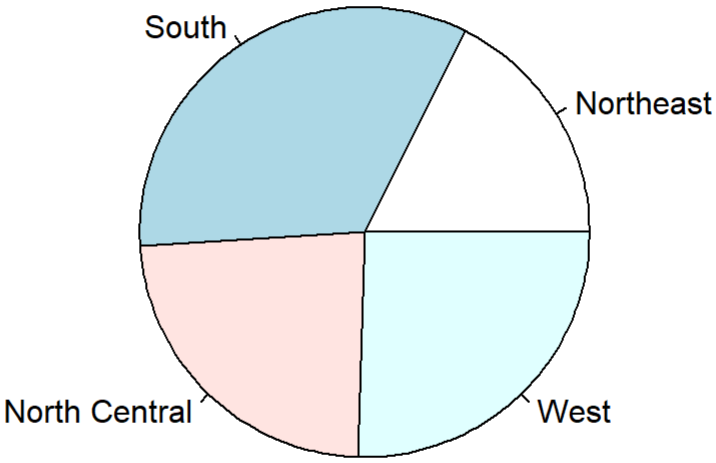
QQ PLOT

```
x= runif(100,0,1)
qqnorm(x)
```



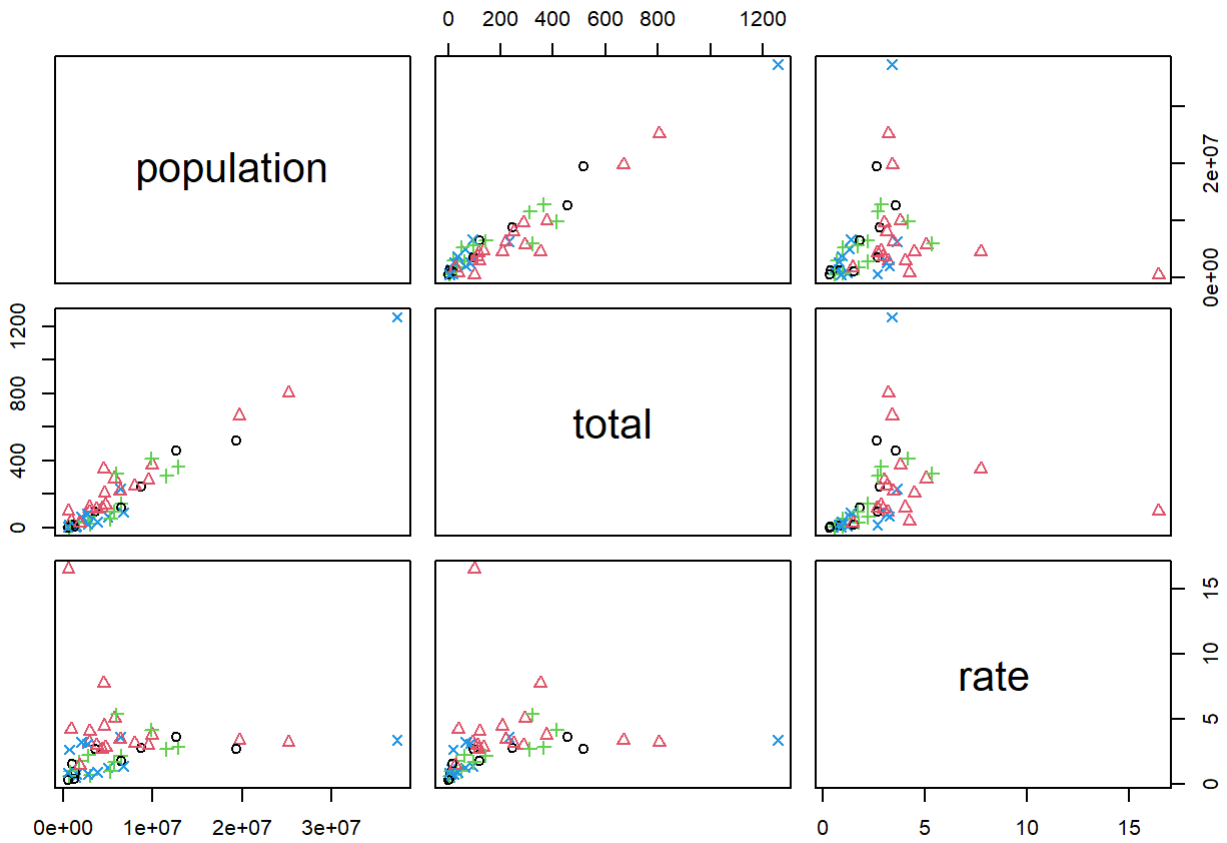
pie charts

```
pie(summary(murders$region))
```



Pair Plot

```
x<-murders[,4:6]
pairs(x,col= as.numeric(murders$region),pch=as.numeric(murders$region))
```



IF ELSE AND LOOPS ===

```
x<-10
if(x<20){
  print("hi i am in france")
}
```

```
## [1] "hi i am in france"
```

```
x<-10
if(x>20){
  print("hi i am in france")
}else{
  print(" Hi I am in USA")
}
```

```
## [1] " Hi I am in USA"
```

```
x<-9
if(x>20){
  print("hi i am in france")
}else if(x <10){
  print(" I am in Germany")
  }else{
  print(" Hi I am in USA")
}
```

```
## [1] " I am in Germany"
```

```
runif(1,0,10)
```

```
## [1] 3.076148
```

```
x<-9
y<- if(x>20){
  "hi i am in france"
}else if(x <10){
  " I am in Germany"
  }else{
  " Hi I am in USA"
  }
y
```

```
## [1] " I am in Germany"
```

```
for(i in 1:10){
  print(i)
}
```

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

```
count<-10

while(count>1){
  print(count)
  count<- count-1
}
```

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