statistical Learning

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Ch-2: Statistical Learning

Lab

Basic commands

```
x=c(1,3,4,5)
x
```

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

```
y=c(4,5,80,-3)
y
```

```
## [1]  4  5 80 -3
```

```
length(x)
```

```
## [1] 4
```

```
length(x)+length(y)
```

```
## [1] 8
```

```
x-y
```

```
## [1]  -3  -2 -76   8
```

```
z=x+y
```

```

ls()
```

ls() and Rm()

```
## [1] "x" "y" "z"
```

```
rm(z)
ls()
```

```
## [1] "x" "y"
```

```
rm(list=ls()) #empty out the list
ls()
```

```
## character(0)
```

```
x = matrix(data=c(1,2,3,4,5,6), nrow=2 , ncol = 3, byrow=TRUE)
x
```

matrix() fucntion

```
##      [,1] [,2] [,3]
## [1,]    1    2    3
## [2,]    4    5    6
```

```
y = matrix(data=c(1,2,3,4,5,6), nrow=2 , ncol = 3, byrow=FALSE)
y
```

```
##      [,1] [,2] [,3]
## [1,]    1    3    5
## [2,]    2    4    6
```

removing the data=, nrow=, ncol= we can also write directly , by default we get byrows = false meaning the columns get filled first

```
z= matrix(c(1,2,3,4,5,6), 3,2)
z
```

```
##      [,1] [,2]
## [1,]    1    4
## [2,]    2    5
## [3,]    3    6
```

```
sqrt(x)
```

```
##      [,1]     [,2]     [,3]
## [1,]    1 1.414214 1.732051
## [2,]    2 2.236068 2.449490
```

```
y^2
```

```
##      [,1] [,2] [,3]
## [1,]    1    9   25
## [2,]    4   16   36
```

rnorm() gives random values every time we use it

```
x=rnorm(50)

y=x+rnorm(50,mean=50, sd=.1)
cor(x,y)
```

```
## [1] 0.9931492
```

we use set seed() so that we get same random numbers every time for a particular seed value

```
set.seed(1303)
rnorm(50)
```

```
##  [1] -1.1439763145  1.3421293656  2.1853904757  0.5363925179  0.0631929665
##  [6]  0.5022344825 -0.0004167247  0.5658198405 -0.5725226890 -1.1102250073
## [11] -0.0486871234 -0.6956562176  0.8289174803  0.2066528551 -0.2356745091
## [16] -0.5563104914 -0.3647543571  0.8623550343 -0.6307715354  0.3136021252
## [21] -0.9314953177  0.8238676185  0.5233707021  0.7069214120  0.4202043256
## [26] -0.2690521547 -1.5103172999 -0.6902124766 -0.1434719524 -1.0135274099
## [31]  1.5732737361  0.0127465055  0.8726470499  0.4220661905 -0.0188157917
## [36]  2.6157489689 -0.6931401748 -0.2663217810 -0.7206364412  1.3677342065
## [41]  0.2640073322  0.6321868074 -1.3306509858  0.0268888182  1.0406363208
## [46]  1.3120237985 -0.0300020767 -0.2500257125  0.0234144857  1.6598706557
```

```r
set.seed(3)
y=rnorm(100)
mean(y)
```

```
## [1] 0.01103557
```

```r
var(y)
```

```
## [1] 0.7328675
```

```r
sqrt(var(y))
```

```
## [1] 0.8560768
```

```r
sd(y)
```

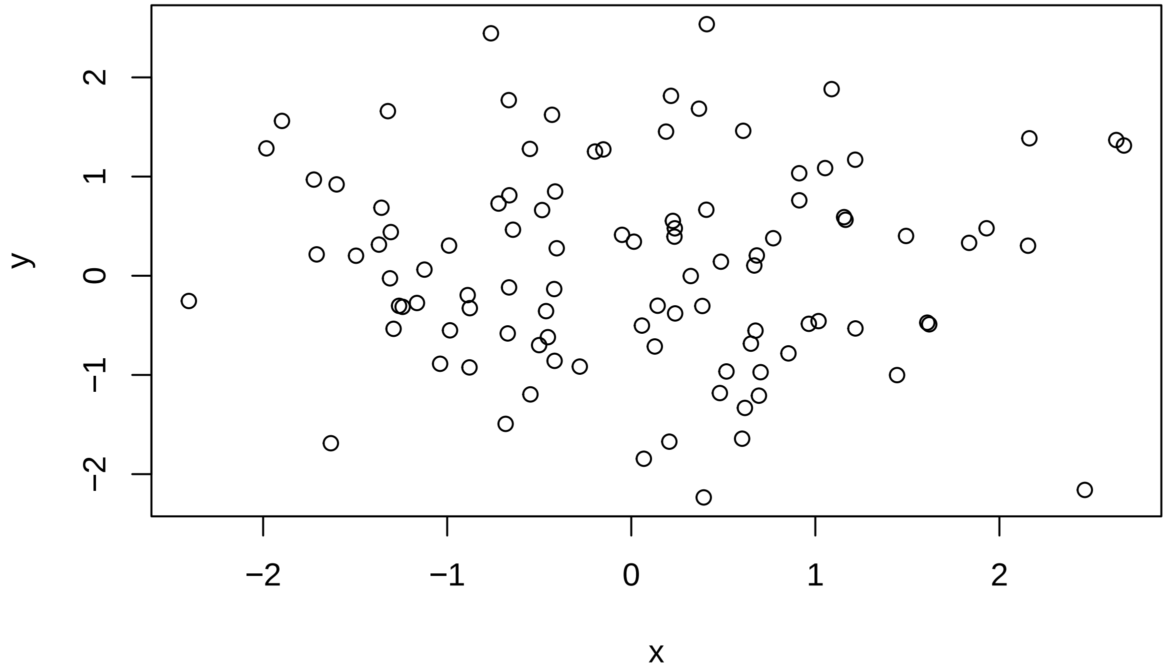
```
## [1] 0.8560768
```

```r
#as we see variance = standard deviation.sq
```

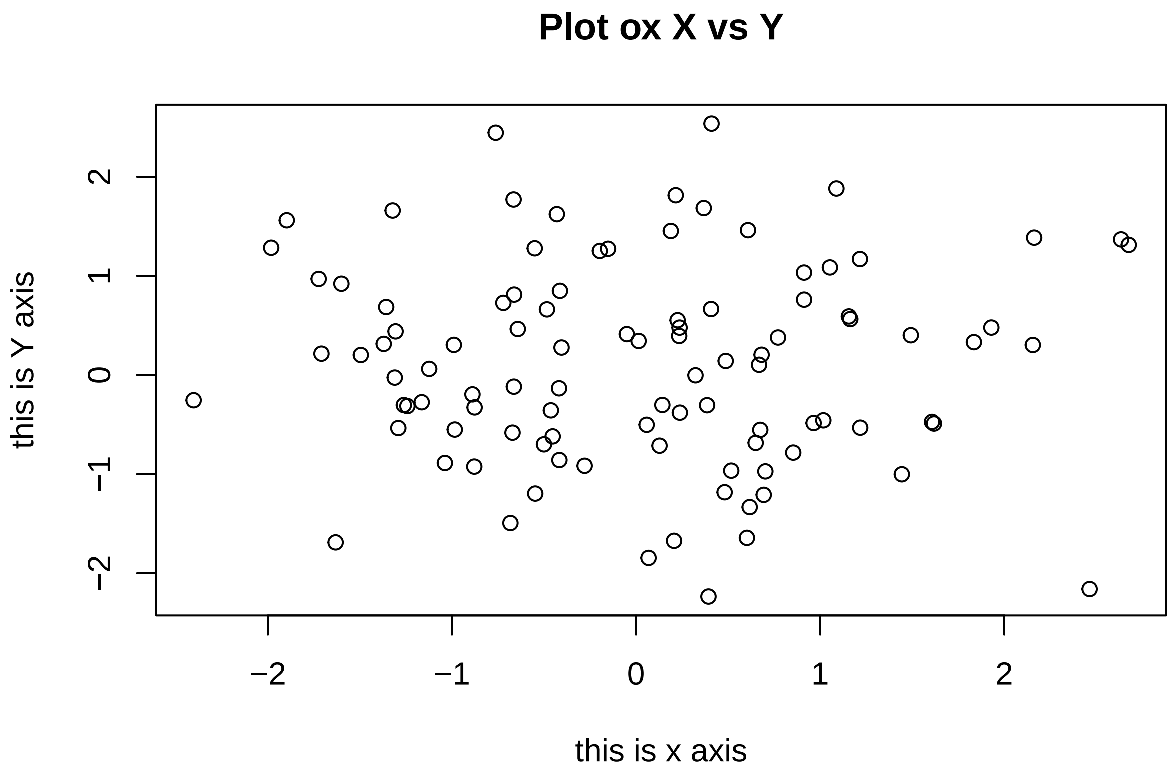
Graphics

plot()

```r
x=rnorm(100)
y=rnorm(100)
plot(x,y)
```



```
plot(x,y,xlab = "this is x axis", ylab = "this is Y axis", main="Plot ox X vs Y")
```


Plot ox X vs Y
this is Y axis
this is x axis