HW5

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```
 Stockreturns <- c(-8.36,   1.63,  -2.27, -2.93,  -2.70,
                           -2.93, -9.14, -2.64, 6.82,   -2.35,
                           -3.58,   6.13,   7.00, -15.25, -8.66,
                           -1.03, -9.16,  -1.25, -1.22,  -10.27,
                           -5.11, -0.80,  -1.44,  1.28,  -0.65,
                            4.34,   12.22, -7.21, -0.09, 7.34,
                            5.04,  -7.24,  -2.14, -1.01,  -1.41,
                            12.03, -2.53,  4.33,  1.35)
Stockreturns
```

```
##  [1]  -8.36   1.63  -2.27  -2.93  -2.70  -2.93  -9.14  -2.64   6.82  -2.35
## [11]  -3.58   6.13   7.00 -15.25  -8.66  -1.03  -9.16  -1.25  -1.22 -10.27
## [21]  -5.11  -0.80  -1.44   1.28  -0.65   4.34  12.22  -7.21  -0.09   7.34
## [31]   5.04  -7.24  -2.14  -1.01  -1.41  12.03  -2.53   4.33   1.35
```

```
length(Stockreturns)
```

```
## [1] 39
```

1.

```
mean(Stockreturns)
```

```
## [1] -1.124615
```

2.

```
sd(Stockreturns)
```

```
## [1] 5.977673
```

3.

```
length(Stockreturns[Stockreturns < -1.5] ) / length(Stockreturns) *100
```

```
## [1] 46.15385
```

```r
#or
pnorm(q = -1.5 , mean = -1.12 , sd = 5.98)*100
```

```
## [1] 47.46662
```

4.

```r
qnorm(p = 0.7, mean = -1.12, sd = 5.98)
```

```
## [1] 2.015915
```

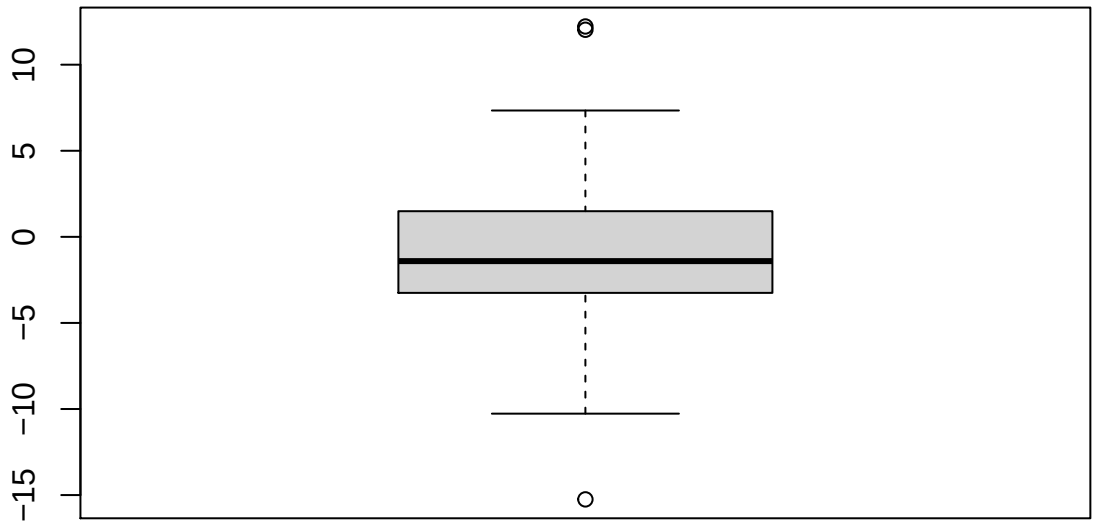
5.

```r
quantile(Stockreturns , 0.25)
```

```
##    25%
## -3.255
```

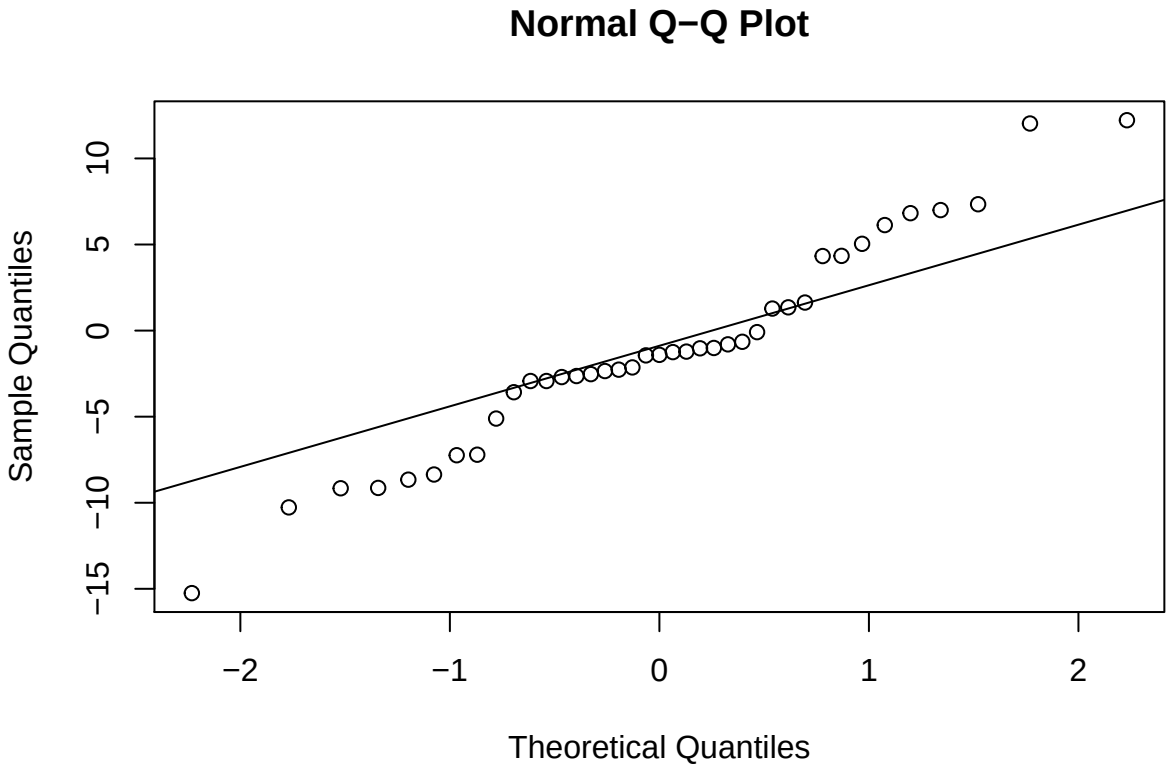
6.

```r
boxplot(Stockreturns)
```



```
#"As we can see, the box is symmetrical with the mean and median in the center. Moreover, we can see fe

qqnorm(Stockreturns)
qqline(Stockreturns)
```




```
#Some points are not close along the line, it seems that it dose not have normal distribution.
```

7-8 H0 : u >= 0.95 , H1 : u < 0.95

```
t.test(Stockreturns ,mu = 0.95 , alternative = "less", conf.level = .95)
```

```
##
##  One Sample t-test
##
## data:  Stockreturns
## t = -2.1674, df = 38, p-value = 0.01827
## alternative hypothesis: true mean is less than 0.95
## 95 percent confidence interval:
##       -Inf 0.4891698
## sample estimates:
## mean of x
## -1.124615
```

```
#p-value = 0.01827 < 0.05, we reject H0. mu = 0.95 is not in the confidence interval.
#we reject null hypothesis as well.
```

9. Yes, the broker is worse than average. Since the p-value $< .05$, there is sufficient evidence at the 0.05 level of significance to reject the claim that mean of return is greater or equal to 0.95.