for_loop_and_more

sn0wfree

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1 Quantitative Research Methods Term 1

this chapter aim at the for loop for r language.

if you totally understand the for loop from ang another language, you may ignore this chapter

1.1 for loop

```
for (i in 1:10){print(c(i,i^.5))}
```

```
## [1] 1 1
## [1] 2.000000 1.414214
## [1] 3.000000 1.732051
## [1] 4 2
## [1] 5.000000 2.236068
## [1] 6.00000 2.44949
## [1] 7.000000 2.645751
## [1] 8.000000 2.828427
## [1] 9 3
## [1] 10.000000  3.162278
```

```
x=0
for (i in 1:10){x[i]=i^.5}
y=0
for (i in 10:2){x[i]=i^.5
print(x[i])}
```

```
## [1] 3.162278
## [1] 3
## [1] 2.828427
## [1] 2.645751
## [1] 2.44949
## [1] 2.236068
## [1] 2
## [1] 1.732051
## [1] 1.414214
```

```r
#for loop to add each previous number
#function#1
for(i in 1:10){x=x+i
print(x)}
```

```
##  [1] 2.000000 2.414214 2.732051 3.000000 3.236068 3.449490 3.645751
##  [8] 3.828427 4.000000 4.162278
##  [1] 4.000000 4.414214 4.732051 5.000000 5.236068 5.449490 5.645751
##  [8] 5.828427 6.000000 6.162278
##  [1] 7.000000 7.414214 7.732051 8.000000 8.236068 8.449490 8.645751
##  [8] 8.828427 9.000000 9.162278
##  [1] 11.00000 11.41421 11.73205 12.00000 12.23607 12.44949 12.64575
##  [8] 12.82843 13.00000 13.16228
##  [1] 16.00000 16.41421 16.73205 17.00000 17.23607 17.44949 17.64575
##  [8] 17.82843 18.00000 18.16228
##  [1] 22.00000 22.41421 22.73205 23.00000 23.23607 23.44949 23.64575
##  [8] 23.82843 24.00000 24.16228
##  [1] 29.00000 29.41421 29.73205 30.00000 30.23607 30.44949 30.64575
##  [8] 30.82843 31.00000 31.16228
##  [1] 37.00000 37.41421 37.73205 38.00000 38.23607 38.44949 38.64575
##  [8] 38.82843 39.00000 39.16228
##  [1] 46.00000 46.41421 46.73205 47.00000 47.23607 47.44949 47.64575
##  [8] 47.82843 48.00000 48.16228
##  [1] 56.00000 56.41421 56.73205 57.00000 57.23607 57.44949 57.64575
##  [8] 57.82843 58.00000 58.16228
```

```r
#function#2
for(i in 1:10){y[i+1]=y[i]+i;print (y[i+1])}
```

```
## [1] 1
## [1] 3
## [1] 6
## [1] 10
## [1] 15
## [1] 21
## [1] 28
## [1] 36
## [1] 45
## [1] 55
```

1.2 random number

sample the random based on different distributions

```r
#uniform to sample data
runif(10,1,10)
```

```
##  [1] 8.064172 7.944557 1.359231 1.749102 2.931940 5.204530 2.556348
##  [8] 5.146081 4.515215 5.475234
```

```r
#interge digital
trunc(runif(5,1,7))
```

```
## [1] 4 5 6 6 4
```

```r
round(runif(5,1,7),2)
```

```
## [1] 3.30 4.27 3.24 1.50 5.05
```

```r
signif(10)
```

```
## [1] 10
```

```r
#normally sample
rnorm(5,mean =0 ,sd =1 )
```

```
## [1]  2.24323053 -0.77035520  0.08860959 -0.19357429  0.48597215
```

```r
round(rnorm(5,mean =0 ,sd =1 ),2)
```

```
## [1] -0.48  0.59 -0.89 -0.84 -0.24
```

```r
for(i in 1:10){print(rnorm(5,-2,3))}
```

```
## [1] -7.19787752 -0.20643177 -1.57664134  0.05308858  3.50430528
## [1]  1.255321  4.211316 -3.191485 -2.531368 -5.280840
## [1] -0.1867052  3.0919443 -2.4968728  1.3933952 -4.6610501
## [1] -2.754703 -3.225492  3.847510 -7.391473 -0.421579
## [1] -2.0749927 -0.6385936  1.8281053  0.1826911  0.2867708
## [1]  0.8547833  4.0307450 -3.7120561 -0.8610206 -6.9578460
## [1] -1.8334633 -4.4908456 -1.6691265 -3.6783949  0.4701552
## [1]  3.6576429  2.4335486 -2.2088778  0.7480933 -3.2326004
## [1] -1.846362 -2.995915 -1.145785 -2.231883 -3.058698
## [1] -6.608157 -2.289310 -4.929116 -5.474513 -5.904411
```

```r
#take sample
sample(x=1:10,replace=TRUE)
```

```
##  [1] 8 5 4 6 7 7 7 4 1 6
```

```r
sample(x=1:10,size=2,replace=TRUE)
```

```
## [1] 6 8
```

```r
sample(x=1:10,size=1,replace=0)
```

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

```r
x=rnorm(10,-.5,2)
t.test(x,mu=0,alternative = "less")
```

```
##
##  One Sample t-test
##
## data:  x
## t = 0.18927, df = 9, p-value = 0.573
## alternative hypothesis: true mean is less than 0
## 95 percent confidence interval:
##      -Inf 1.239181
## sample estimates:
## mean of x
## 0.1159747
```

1.3 bootstrap-1

```
x=rnorm(20,-.5,1)
y=sample(1:20,replace = 1)

leaveit=x
mean(leaveit)
```

```
## [1] -0.7968036
```

```
m=0
#for(i in 1:10000){print(mean(leaveit[sample(1:20,replace = 1)]))}
for(i in 1:10000){m[i]=mean(leaveit[sample(1:20,replace = 1)])}
mean(m)
```

```
## [1] -0.7971336
```

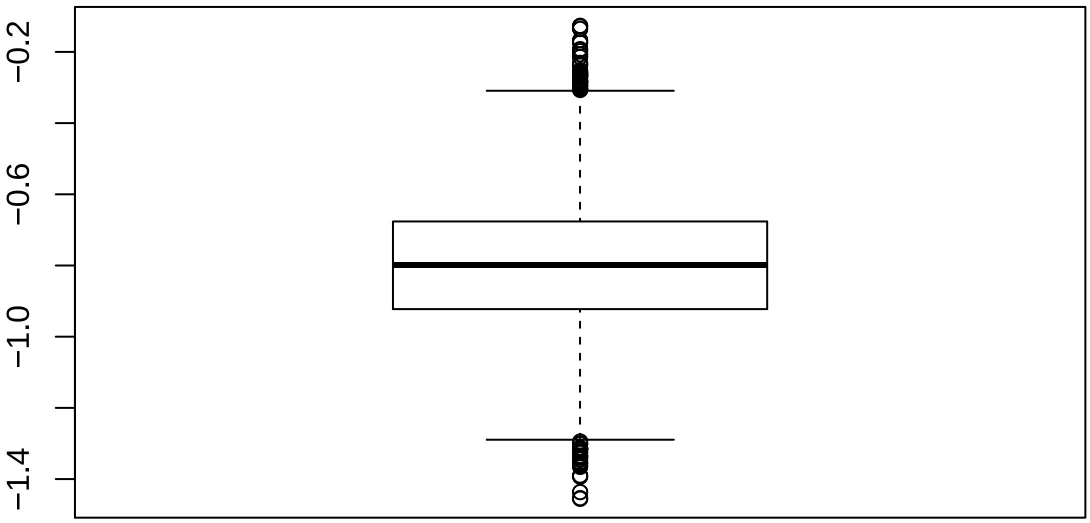
```
sd(m)
```

```
## [1] 0.1829713
```

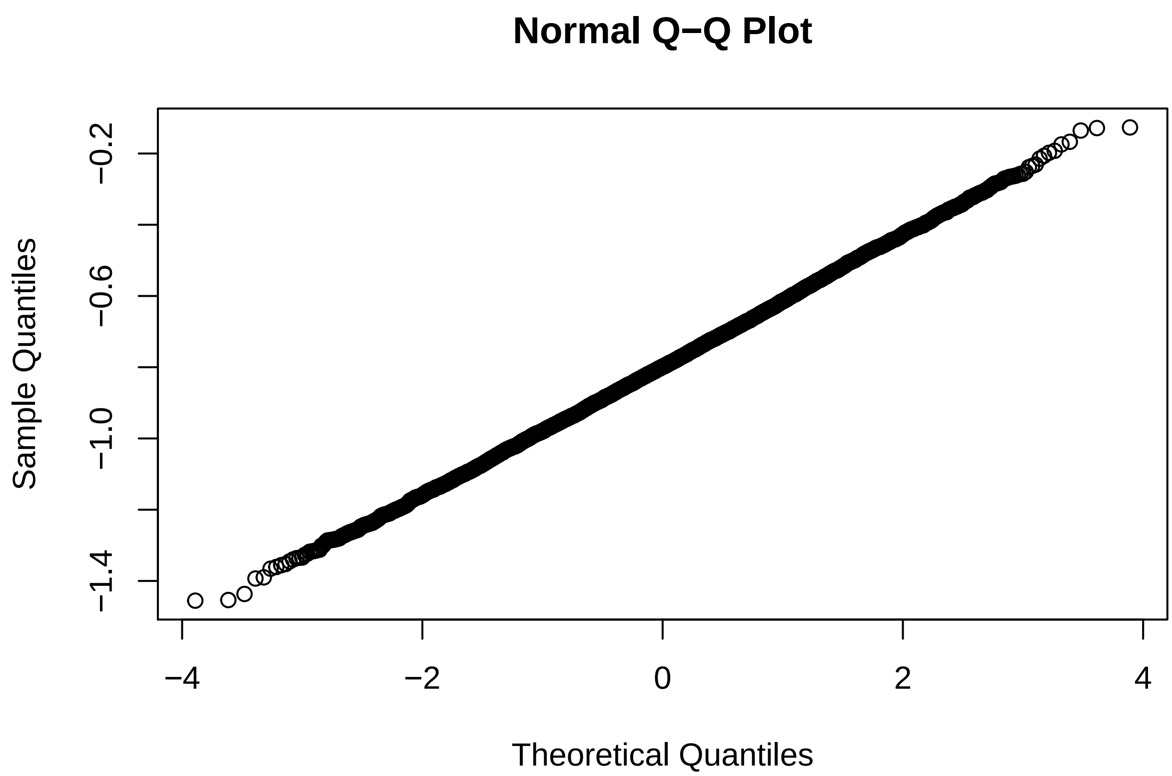
```
t.test(m,mu=-0.5)
```

```
##
##  One Sample t-test
##
## data:  m
## t = -162.39, df = 9999, p-value < 2.2e-16
## alternative hypothesis: true mean is not equal to -0.5
## 95 percent confidence interval:
##  -0.8007202 -0.7935470
## sample estimates:
##  mean of x
## -0.7971336
```

```
boxplot(m)
```




```
qqnorm(m)
```



##

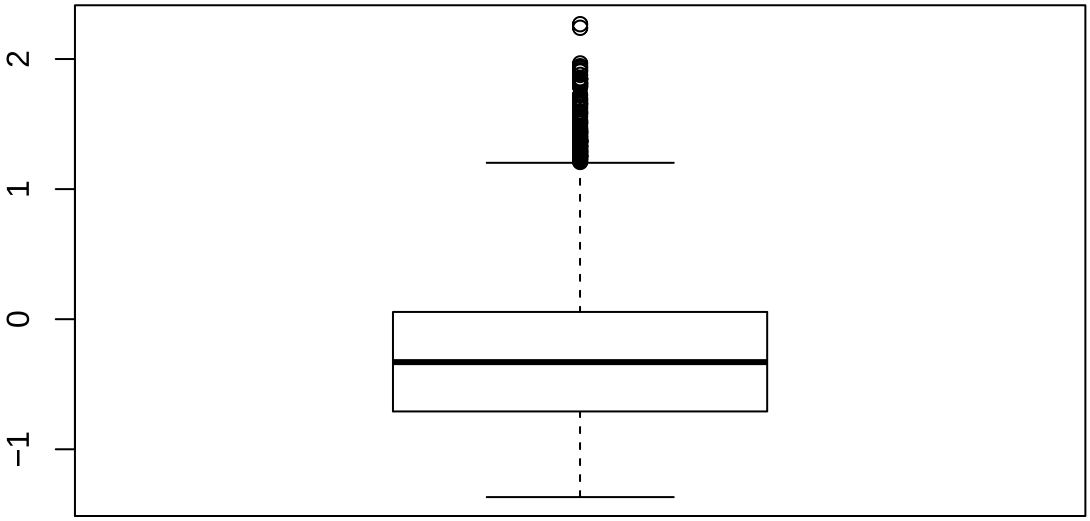
bootstrap-2

```
for(i in 1:10000){
  m[i]=mean(leaveit[sample(1:20,replace = 1)])}
pos=0

for (i in 1:10000){
  if (m[i] > 0){
    pos=pos+1
  }
}
pos
```

```
## [1] 0
```

```
leaveit[21]=10
for(i in 1:10000){
  m[i]=mean(leaveit[sample(1:21,replace = 1)])}
pos=0
boxplot(m)
```




```
for (i in 1:10000){
  if (m[i] > 0){
    pos=pos+1
  }
}
pos
```

```
## [1] 2715
```