Bootstrapping Assignment in R

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Part 1

upload necessary packages

```
library("boot")
```

set up problem

```
set.seed(123)
theta = 12 # parameter for the uniform
dat <- (c(runif(100)*theta))
```

define function using minimum and maximum

```
fc_minandmax <- function(d, i){
  d3 <- d[i]
  return(min(d3) + max(d3))
}
```
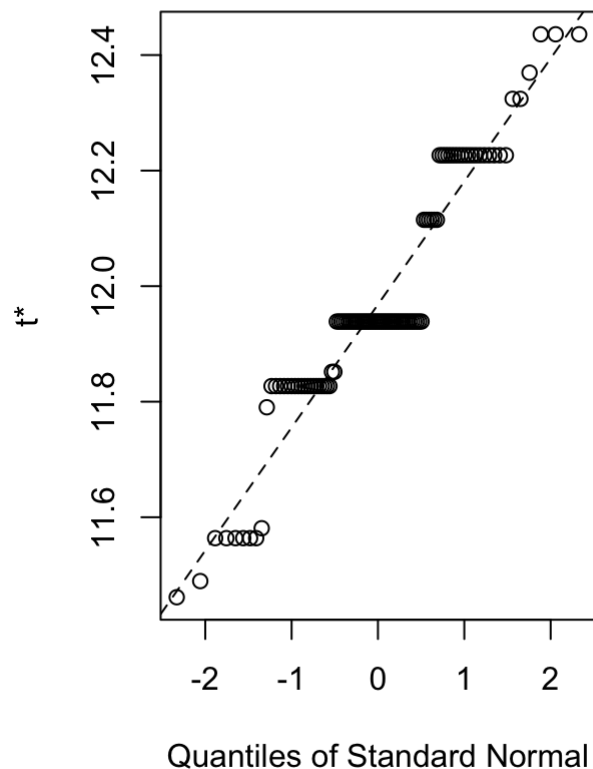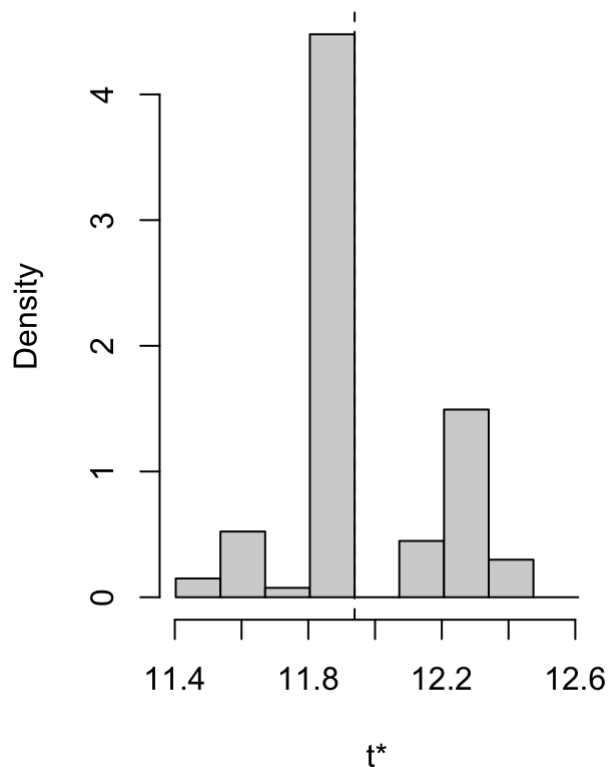
perform bootstrap

```
set.seed(321)
b.minandmax = boot(dat, fc_minandmax, R = 100)
b.minandmax
```

```
##
## ORDINARY NONPARAMETRIC BOOTSTRAP
##
##
## Call:
## boot(data = dat, statistic = fc_minandmax, R = 100)
##
##
## Bootstrap Statistics :
##     original      bias    std. error
## t1* 11.93873 0.02951824   0.2129743
```

```
plot(b.minandmax)
```

Histogram of t

Part 2

```
set.seed(123)
theta = 8 # parameter for the uniform
dat = c(rexp(100)*theta)
```

define function using x bar (mean)

```r
fc_mean <- function(d, i) {
  d2 <- d[i]
  return(mean(d2))
}
```
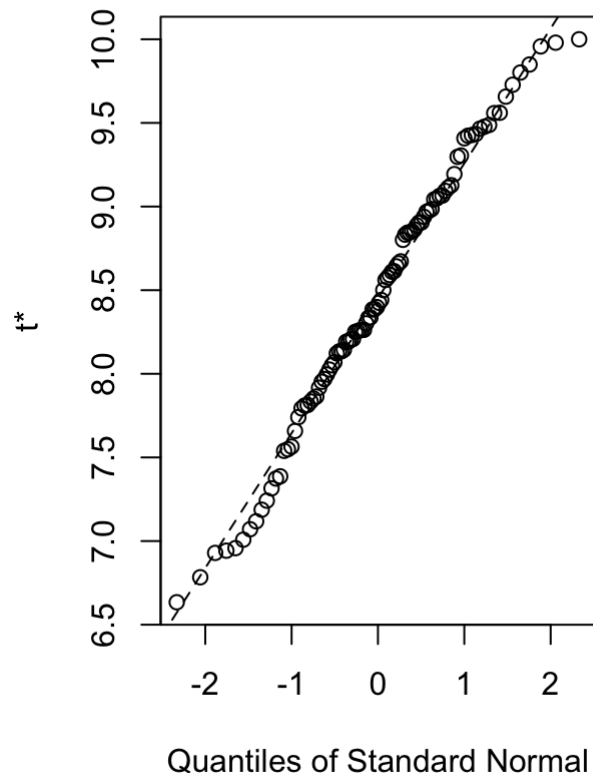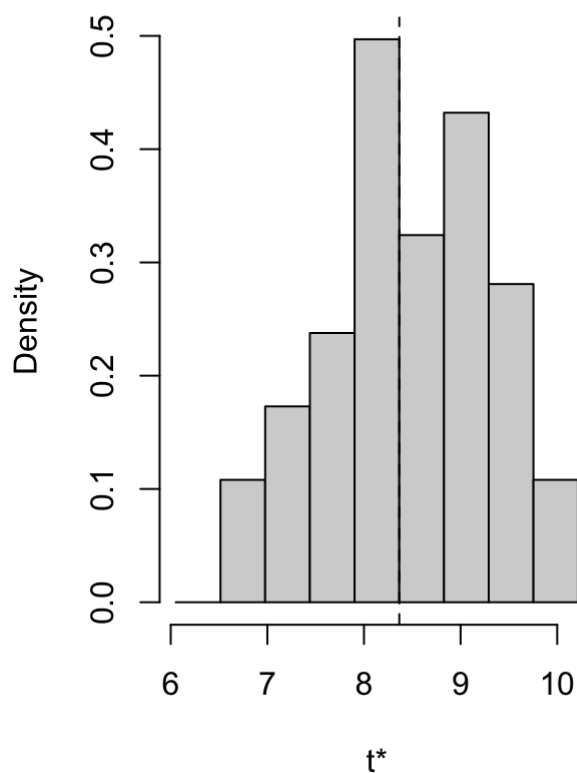
perform bootstrap

```r
set.seed(321)
b.mean = boot(dat, fc_mean, R = 100)
b.mean
```

```
##
## ORDINARY NONPARAMETRIC BOOTSTRAP
##
##
## Call:
## boot(data = dat, statistic = fc_mean, R = 100)
##
##
## Bootstrap Statistics :
##     original      bias    std. error
## t1*  8.36575 0.08598896   0.8065848
```

```r
plot(b.mean)
```

Histogram of t

define function using median

```
fc_med <- function(d, i){
  d2 <- d[i]
  return(median(d2))
}
```

perform bootstrap

```
set.seed(321)
b.med = boot(dat, fc_med, R = 100)
b.med
```

```
## 
## ORDINARY NONPARAMETRIC BOOTSTRAP
## 
## 
## Call:
## boot(data = dat, statistic = fc_med, R = 100)
## 
## 
## Bootstrap Statistics :
##     original     bias     std. error
## t1* 6.782032 0.1696336   0.9905104
```

```
plot(b.med)
```

Histogram of t