

Exercise 3

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Reading the Data

```
original_data <- read.table("Mean20.txt", header=T)
```

Computing the Median, Mean, Standard Deviation, min and maximum of the variable time.

```
summary(original_data)
```

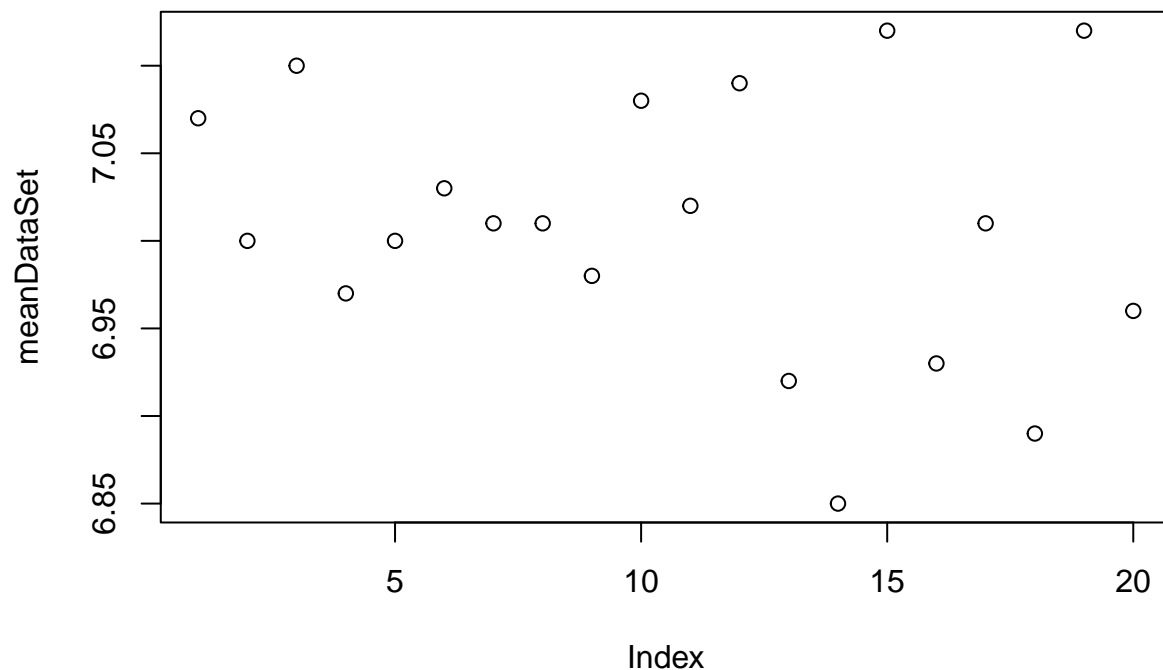
```
##           time
##  Min.      :-7.01
##  1st Qu.: 6.96
##  Median : 7.01
##  Mean   : 6.34
##  3rd Qu.: 7.07
##  Max.    : 7.12
##  NA's    :1
```

As we can see with the summary command, we need to do some preprocessing of the dataset, as there is a negative time and one NA.

```
meanDataSet <- na.omit(original_data)
meanDataSet <- meanDataSet[which(meanDataSet$time >=0),]
summary(meanDataSet)
```

```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   6.850   6.968   7.010   7.008   7.072   7.120
```

```
plot(meanDataSet)
```



late the Min, Max, mean, standard deviation and median one NA.

```
media <- median(meanDataSet)
mean <- mean(meanDataSet)
min <- min(meanDataSet)
max <- max(meanDataSet)
std <- sd(meanDataSet)
```

Exercise 2

```
t.test(meanDataSet, mu=7.05)
```

```
##
## One Sample t-test
##
## data: meanDataSet
## t = -2.4992, df = 19, p-value = 0.02178
## alternative hypothesis: true mean is not equal to 7.05
## 95 percent confidence interval:
##  6.972826 7.043174
## sample estimates:
## mean of x
##      7.008
```

```
t.test(original_data, mu=7.05)
```

```
##
## One Sample t-test
##
## data: original_data
## t = -1.0626, df = 20, p-value = 0.3006
## alternative hypothesis: true mean is not equal to 7.05
## 95 percent confidence interval:
##  4.947647 7.733306
```

```
## sample estimates:
## mean of x
## 6.340476
```

We can find no significant indication that the mean is 7.05. Thus the alternative hypothesis must be considered true, that the mean is not equal to 7.05

The difference to the original Data set is that the confidence interval is larger.

Question 3

With this knowledge we can do a one sided test.

```
t.test(meanDataSet, mu=7.05, alternative = "greater")

##
## One Sample t-test
##
## data: meanDataSet
## t = -2.4992, df = 19, p-value = 0.9891
## alternative hypothesis: true mean is greater than 7.05
## 95 percent confidence interval:
## 6.978941 Inf
## sample estimates:
## mean of x
## 7.008
```

Same thing, it is still not significant.

Question 4

```
secondMax <- function (vector){
  if(!is.vector(vector)){
    stop("Argument must be a vector")
  }
  n <- length(vector)
  return( sort(vector,partial=n-1)[n-1])
}
secondMax(meanDataSet)
```

```
## [1] 7.12
```

```
secondMax(c(1,2,3,4))
```

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

Question 5

I think the Goal is to return the Summary so I will do this.

```
mySummary <- function(x){
  media <- median(meanDataSet)
  mean <- mean(meanDataSet)
  min <- min(meanDataSet)
  max <- max(meanDataSet)
  std <- sd(meanDataSet)
  return(c(mean, media, std, min, max))
}
```

```
}
```

```
mySummary(medianDataSet)
```

```
## [1] 7.00800000 7.01000000 0.07515598 6.85000000 7.12000000
```