1 Question 1

```
data <- c(45, 50, 55, 60, 65, 70, 75, 80)
mean_data <- mean(data)
median_data <- median(data)
variance_data <- var(data)
std_data <- sd(data)

mean_data
```

```
## [1] 62.5
```

```
median_data
```

```
## [1] 62.5
```

```
variance_data
```

```
## [1] 150
```

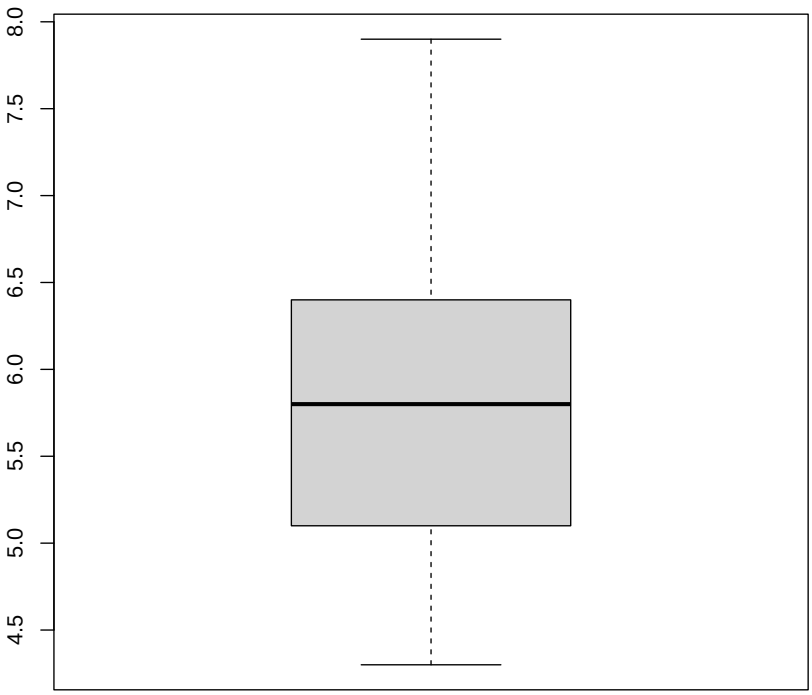
```
std_data
```

```
## [1] 12.24745
```

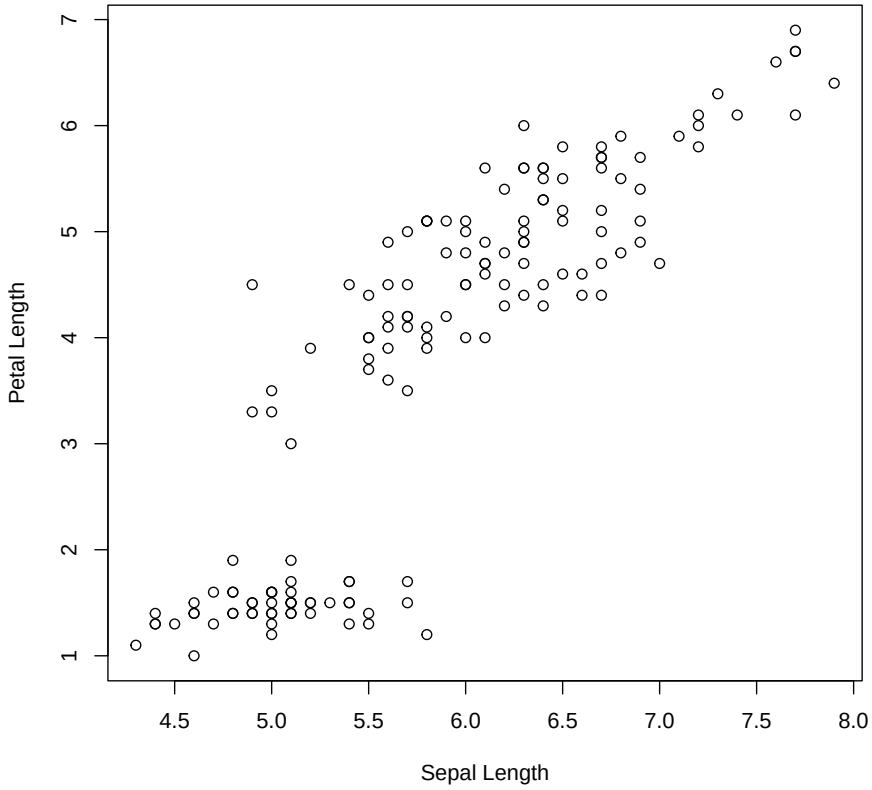
2 question 2

```
library(datasets)
data <- iris

boxplot(data$Sepal.Length)
```




```
plot(data$Sepal.Length, data$Petal.Length, xlab="Sepal Length", ylab="Petal Length")
```



3 question 3

```
#Null hypothesis: There is significant differences
#Alter hypo: There is significant difference.
brand_a <- c(12.4, 13.1, 14.2, 15.0, 13.8)
brand_b <- c(11.9, 12.5, 13.0, 12.8, 13.2)

t_stat <- t.test(brand_a, brand_b, alternative = "two.sided", var.equal=TRUE, conf.level = (
t_stat

##
##  Two Sample t-test
##
```

```
## data:  brand_a and brand_b
## t = 2.0343, df = 8, p-value = 0.07634
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -0.136226  2.176226
## sample estimates:
## mean of x mean of y
##     13.70     12.68

# given that p_value is 0.07 which is more than 0.05. We reject the null hypothesis that the
```

4 question 4

```
before <- c(15.2, 14.8, 15.5, 16.0, 15.7)
after <- c(14.5, 14.0, 14.8, 15.2, 14.9)

t_stat <- t.test(before, after, paired = TRUE)
t_stat

##
##  Paired t-test
##
## data:  before and after
## t = 31.027, df = 4, p-value = 6.43e-06
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
##  0.6919913 0.8280087
## sample estimates:
## mean difference
##            0.76

# therefore the means are different.
```

5 question 5

```
n1 <- 500
q <- 320
alpha <- 0.05

prop_stat <- prop.test(320, 500, p=0.5, alternative = "greater", correct=FALSE)
prop_stat
```

```
##
##  1-sample proportions test without continuity correction
##
## data:  320 out of 500, null probability 0.5
## X-squared = 39.2, df = 1, p-value = 1.913e-10
## alternative hypothesis: true p is greater than 0.5
## 95 percent confidence interval:
##  0.6040248 1.0000000
## sample estimates:
##    p
## 0.64

# given that the p_value is very very small we accept our null hypothesis that more than ha
```

6 question 6

```
before <- c(72, 75, 78, 80, 74)
after <- c(70, 73, 76, 78, 72)

wil_sta <- wilcox.test(before, after, alternative="two.sided")

## Warning in wilcox.test.default(before, after, alternative = "two.sided"):
cannot compute exact p-value with ties

wil_sta

##
##  Wilcoxon rank sum test with continuity correction
##
## data:  before and after
## W = 17, p-value = 0.4005
## alternative hypothesis: true location shift is not equal to 0

#there is a significat reduction in weight values.
```

7 question 7

```
data <- matrix(c(10, 15,20, 20, 25,30, 30, 35, 40, 40, 25, 35), nrow = 3)
data

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

```
## [1,]   10   20   30   40
## [2,]   15   25   35   25
## [3,]   20   30   40   35

chi_stat <- chisq.test(data)
chi_stat

##
##  Pearson's Chi-squared test
##
## data:  data
## X-squared = 6.7554, df = 6, p-value = 0.3441

# given that the p-value is higher than 0.05, we reject the null hypothesis that the attribu
```

8 question 8

```
# not sure how to do this
```

9 question 9

```
meanwire <- 5
stdwire <- 0.2
probab <- pnorm(5.3, mean=meanwire, sd=stdwire)
probab

## [1] 0.9331928

# probability is 0.933 that randomly selected covering has thickness greater than 5.3mm
```

10 question 10

```
# no idea how to proceed here
```

11 question 11

```r
library(datasets)
data <- mtcars

summary(data)
```

```
##       mpg             cyl             disp             hp       
##  Min.   :10.40   Min.   :4.000   Min.   : 71.1   Min.   : 52.0  
##  1st Qu.:15.43   1st Qu.:4.000   1st Qu.:120.8   1st Qu.: 96.5  
##  Median :19.20   Median :6.000   Median :196.3   Median :123.0  
##  Mean   :20.09   Mean   :6.188   Mean   :230.7   Mean   :146.7  
##  3rd Qu.:22.80   3rd Qu.:8.000   3rd Qu.:326.0   3rd Qu.:180.0  
##  Max.   :33.90   Max.   :8.000   Max.   :472.0   Max.   :335.0  
##       drat             wt             qsec             vs        
##  Min.   :2.760   Min.   :1.513   Min.   :14.50   Min.   :0.0000  
##  1st Qu.:3.080   1st Qu.:2.581   1st Qu.:16.89   1st Qu.:0.0000  
##  Median :3.695   Median :3.325   Median :17.71   Median :0.0000  
##  Mean   :3.597   Mean   :3.217   Mean   :17.85   Mean   :0.4375  
##  3rd Qu.:3.920   3rd Qu.:3.610   3rd Qu.:18.90   3rd Qu.:1.0000  
##  Max.   :4.930   Max.   :5.424   Max.   :22.90   Max.   :1.0000  
##        am              gear            carb      
##  Min.   :0.0000   Min.   :3.000   Min.   :1.000  
##  1st Qu.:0.0000   1st Qu.:3.000   1st Qu.:2.000  
##  Median :0.0000   Median :4.000   Median :2.000  
##  Mean   :0.4062   Mean   :3.688   Mean   :2.812  
##  3rd Qu.:1.0000   3rd Qu.:4.000   3rd Qu.:4.000  
##  Max.   :1.0000   Max.   :5.000   Max.   :8.000
```

```r
histogram(mtcars$mpg, freq=TRUE, xlab="mpg", ylab="count")
```

```
## Error in histogram(mtcars$mpg, freq = TRUE, xlab = "mpg", ylab =
"count"): could not find function "histogram"
```