Quiz6

Name: Vikrom Narula ID: 6081050

Question 1

a) Reject Null hypothesis
b) One

Question 2

```
g1 <- c(121.3, 111.9, 110.1, 105.4, 101.6)
g2 <- c(99.5, 113.2, 108.9, 109.1, 100.4)
g3 <- c(104.2, 109.7, 102.3, 111.2, 106.6)

cg <- data.frame(g1, g2, g3)
summary(cg)
```

```
##        g1              g2              g3
##  Min.   :101.6   Min.   : 99.5   Min.   :102.3
##  1st Qu.:105.4   1st Qu.:100.4   1st Qu.:104.2
##  Median :110.1   Median :108.9   Median :106.6
##  Mean   :110.1   Mean   :106.2   Mean   :106.8
##  3rd Qu.:111.9   3rd Qu.:109.1   3rd Qu.:109.7
##  Max.   :121.3   Max.   :113.2   Max.   :111.2
```

```
sg <- stack(cg)
sg
```

```
##    values ind
## 1   121.3  g1
## 2   111.9  g1
## 3   110.1  g1
## 4   105.4  g1
## 5   101.6  g1
## 6    99.5  g2
## 7   113.2  g2
## 8   108.9  g2
## 9   109.1  g2
## 10  100.4  g2
## 11  104.2  g3
## 12  109.7  g3
## 13  102.3  g3
## 14  111.2  g3
## 15  106.6  g3
```

```
ar <- aov(values ~ ind,data = sg)
summary(ar)
```

```
##             Df Sum Sq Mean Sq F value Pr(>F)
## ind          2   42.8   21.42   0.611  0.559
## Residuals   12  421.1   35.09
```

a) 0.611
b) 0.559
c) Can't reject
d) is no

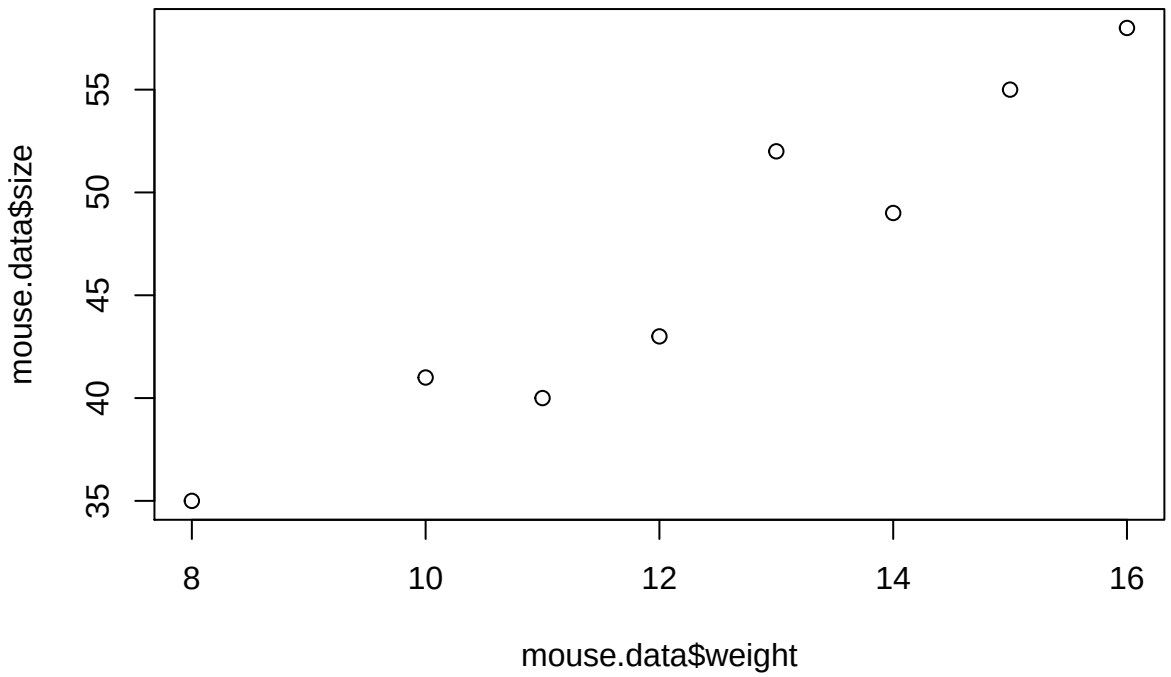
Question 3

```
mouse.data <- data.frame(
  weight=c(16, 11, 15, 8, 12, 10, 13, 14),
  size=c(58, 40, 55, 35, 43, 41, 52, 49))

mouse.data # print the data to the screen in a nice format
```

```
##   weight size
## 1     16   58
## 2     11   40
## 3     15   55
## 4      8   35
## 5     12   43
## 6     10   41
## 7     13   52
## 8     14   49
```

```
## plot a x/y scatter plot with the data
plot(mouse.data$weight, mouse.data$size)
```




```
## create a "linear model" - that is, do the regression
mouse.regression <- lm(size ~ weight, data=mouse.data)
## generate a summary of the regression
```

```r
summary(mouse.regression)
```

```
##
## Call:
## lm(formula = size ~ weight, data = mouse.data)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -2.624 -2.398  0.782  1.150  3.556
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  10.6165     4.3539   2.438 0.050583 .
## weight        2.9098     0.3449   8.437 0.000151 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.436 on 6 degrees of freedom
## Multiple R-squared:  0.9223, Adjusted R-squared:  0.9093
## F-statistic: 71.18 on 1 and 6 DF,  p-value: 0.0001513
```

```r
cor(mouse.data$weight, mouse.data$size, method = "spearman")
```

```
## [1] 0.952381
```

a) 0.9223
b) Positively correlated
c) 0.952381
d) Cause it positively correlated
e) y = 2.9098 * x + 10.6165

Quesion 4

```r
## Here's the data from the video
mouse.data <- data.frame(
  weight=c(1, 2, 3, 4, 5, 6),
  size=c(6.1, 5.1, 5.0, 4.2, 3.7, 3.2))

mouse.data # print the data to the screen in a nice format
```

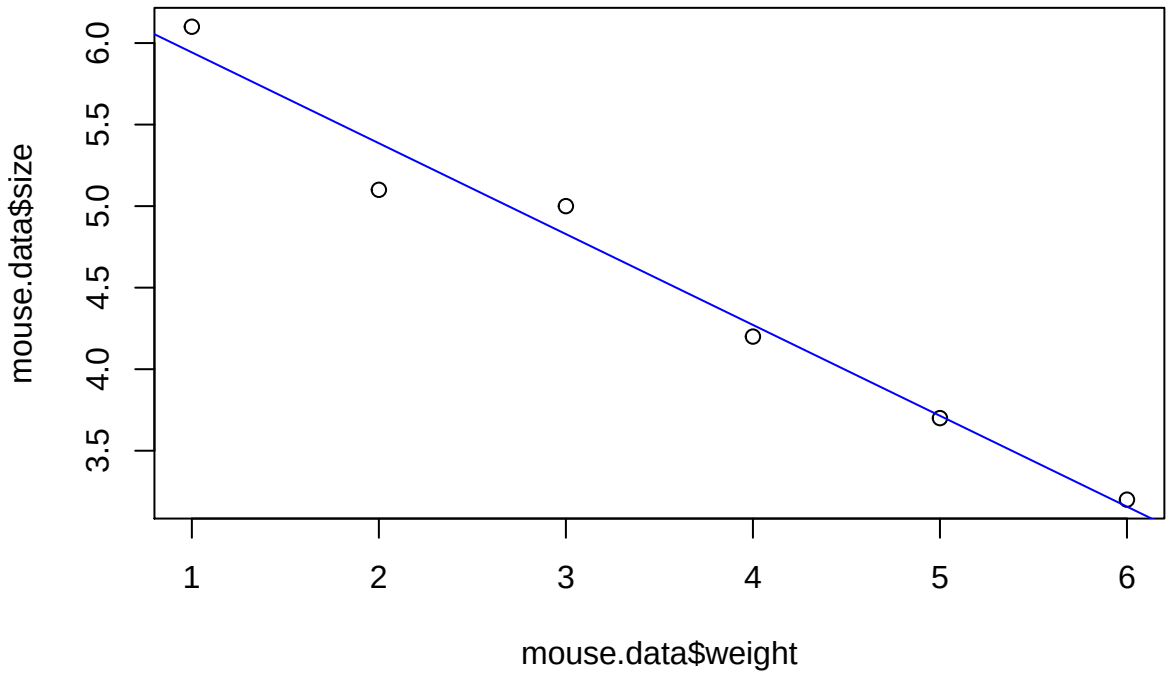
```
##   weight size
## 1      1  6.1
## 2      2  5.1
## 3      3  5.0
## 4      4  4.2
## 5      5  3.7
## 6      6  3.2
```

```r
## plot a x/y scatter plot with the data
plot(mouse.data$weight, mouse.data$size)

## create a "linear model" - that is, do the regression
mouse.regression <- lm(size ~ weight, data=mouse.data)
## generate a summary of the regression
summary(mouse.regression)
```

```
##
## Call:
## lm(formula = size ~ weight, data = mouse.data)
##
## Residuals:
##        1        2        3        4        5        6
##  0.15714 -0.28571  0.17143 -0.07143 -0.01429  0.04286
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  6.50000    0.17593   36.95  3.2e-06 ***
## weight      -0.55714    0.04518  -12.33 0.000248 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.189 on 4 degrees of freedom
## Multiple R-squared:  0.9744, Adjusted R-squared:  0.968
## F-statistic: 152.1 on 1 and 4 DF,  p-value: 0.0002484
```

```
## add the regression line to our x/y scatter plot
plot(mouse.data$weight, mouse.data$size) + abline(mouse.regression, col="blue")
```




```
## integer(0)
```

```
6.50000 - 0.55714 * 3.5
```

```
## [1] 4.55001
```

a) y = 6.50000 - 0.55714 * x

b)

c) yes

d) 4.55001

e) 0.0002484

f) It does provide efficient evidence

g) are

h) 0.9744

i) It shows that the model is a good fit