Advanced Psychological Statistics
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Section 007

Data Assignment #3

Question 1.1

Using r program, I created a dataframe and found the mode of the data. The mode of the data is 21.

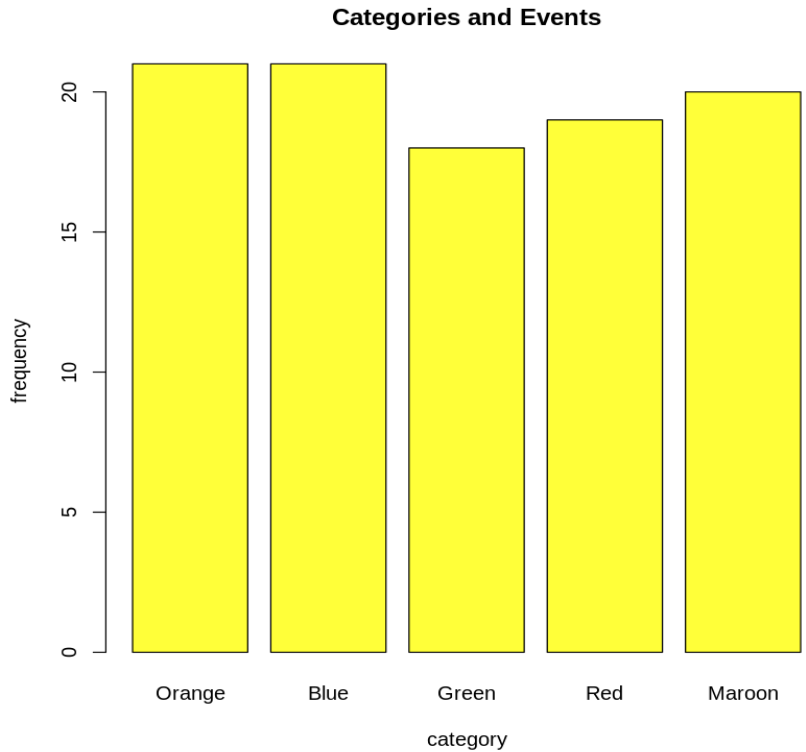
```
categories= c("Orange","Blue","Green","Red","Maroon")
frequency = c(21,21,18,19,20)
dataframe_Q1= data.frame(categories,frequency)
frequency_unique = unique(frequency)
frequency_tabled = tabulate(match(frequency, frequency_unique))
frequency_unique[frequency_tabled == max(frequency_tabled)]
```

21

Question 1.2

I created a barplot of the distribution with the x and y axis labeled.

```
barplot(frequency,
        main = "Categories and Events",
        xlab= "category",
        ylab= "frequency",
        names.arg= c ("Orange","Blue","Green","Red","Maroon"),
        col= "yellow",)
```



Question 2.1

I computed the correlation using pearsons r for this data. The correlation is approximately 0.1683.

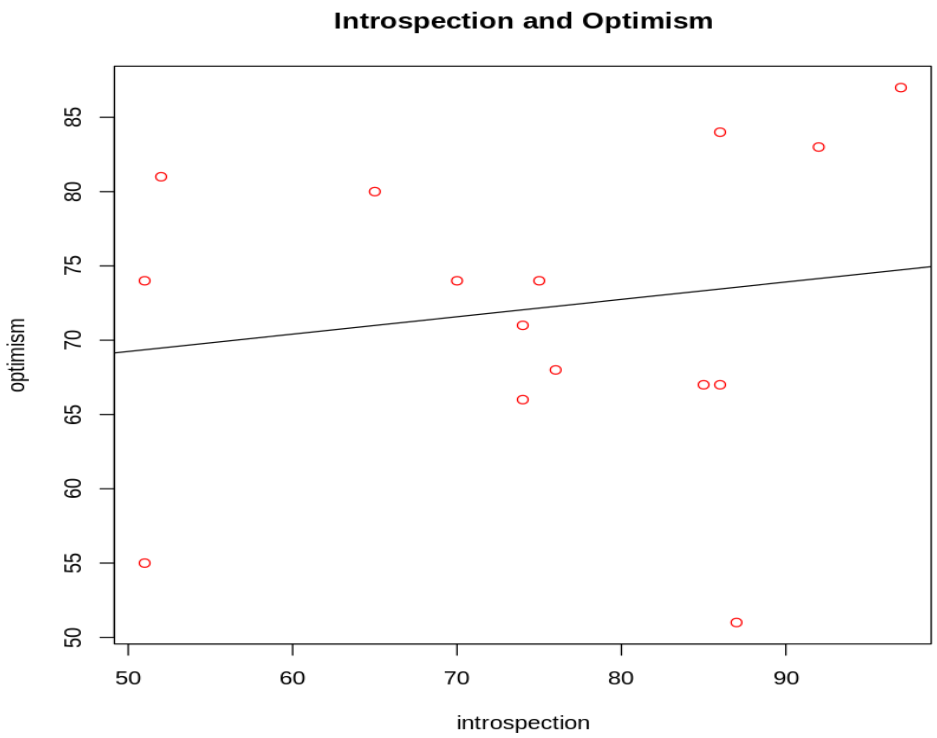
```
introspection= c(51,65,74,74,75,76,87,86,51,85,52,92,97,70,86)
optimism= c(55,80,71,66,74,68,51,67,74,67,81,83,87,74,84)
dataframe_Q2 = data.frame (introspection,optimism)
cor(introspection,optimism, method = c ("pearson"))
```

0.168300591539364

Question 2.2 and 2.3

I plotted introspection against optimism. I also computed the linear model for the data. The slope is 0.1169 and the intercept is 63.3968.

```
plot(introspection,optimism, main = 'Introspection and Optimism', col=
'red')
fit = lm (optimism ~ introspection)
abline(fit)
fit

Call:
lm(formula = optimism ~ introspection)

Coefficients:
  (Intercept)  introspection
      63.3968         0.1169
```



Question 2.4

Given the slope, I expect the trend of the data to show that as introspection increases, optimism increases.

Question 2.5

If introspection has a value of 75, the predicted value of optimism will be 72.1643. I found this by plugging in 75 into the linear equation of y= 0.1168(x) + 63.3968.

Question 3.1

Using the data and a dataframe, I recreated the y values. The y values are 6.199, 6.175, 6.183, 6.195, 6.211, 6.147, 6.191, 6.191, 6.215, 6.135, 6.183, 6.187.

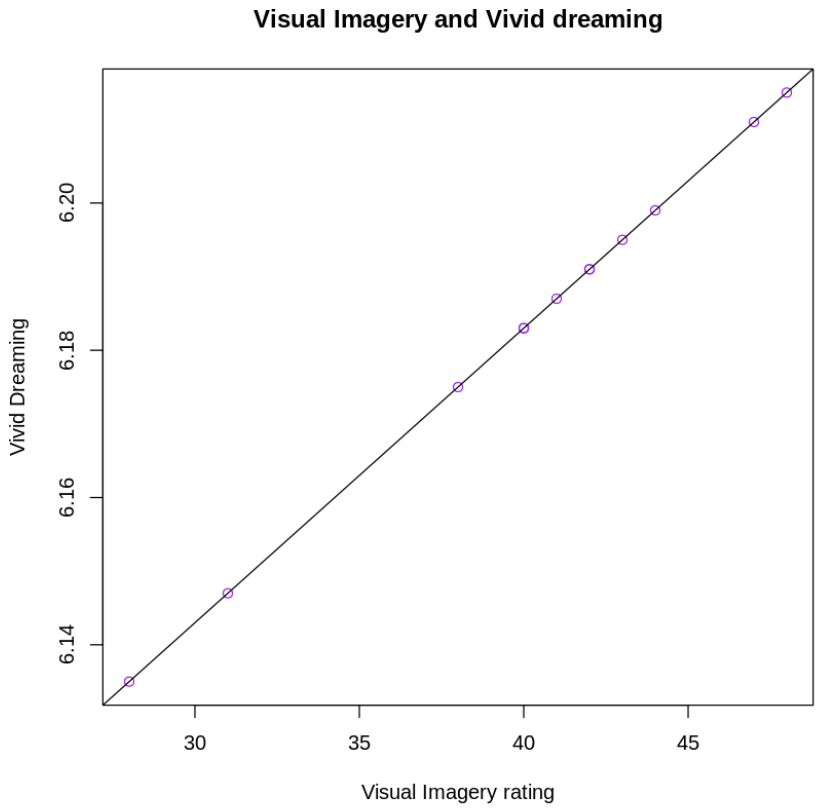
```
dataframe_Q3 = data.frame(
 Participant = 1:12,
 VisualImagery_Rating= c(44,38,40,43,47,31,42,42,48,28,40,41),
 Vivid_Dreaming =NaN
)

slope= 0.004
intercept= 6.023
```

```
for (i in 1:12){
 dataframe_Q3$Vivid_Dreaming[i]=
 slope*dataframe_Q3$VisualImagery_Rating[i]+intercept}
```

Question 3.2

I also created the plot and trendline for the data.

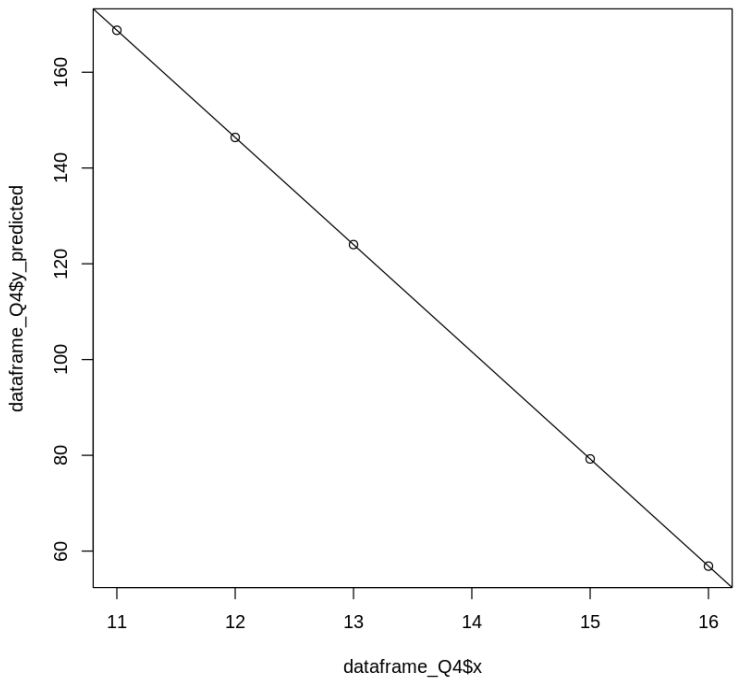
```
plot(dataframe_Q3$VisualImagery_Rating,dataframe_Q3$Vivid_Dreaming,xlab =
"Visual Imagery rating", ylab = "Vivid Dreaming", main = 'Visual Imagery
and Vivid dreaming', col= 'purple')
fit = lm(dataframe_Q3$Vivid_Dreaming ~ dataframe_Q3$VisualImagery_Rating )
abline(fit)
```



Question 4

I created a trend line based on the data table, which contains x values, y predicted values and residuals. I generated the slope and intercept values. The slope is -22.38 and the intercept value is 414.94.

```
dataframe_Q4 = data.frame(
  x = c(16,12,15,13,11),
  y_predicted= c(56.86,146.38,79.2415,124,168.76),
  residuals= c(-21.86,-66.38,30.76,26,31.24),
  y = NaN
)

plot(dataframe_Q4$x, dataframe_Q4$y_predicted)
fit = lm(dataframe_Q4$y_predicted ~dataframe_Q4$x )
abline(fit)
fit

Call:
lm(formula = dataframe_Q4$y_predicted ~ dataframe_Q4$x)

Coefficients:
   (Intercept)  dataframe_Q4$x
        414.94          -22.38
```



Question 4.1

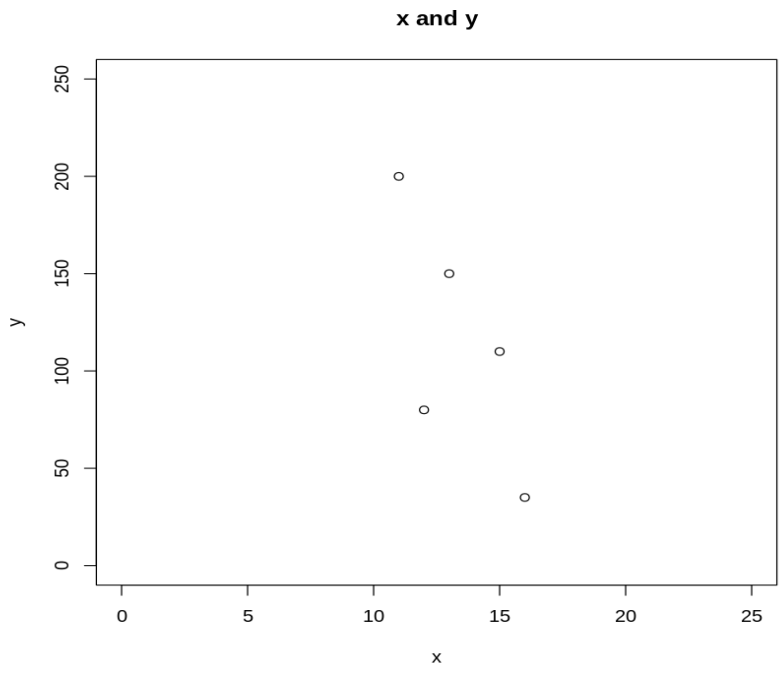
The y values are 35.0, 80.0, 110.0015, 150.0, 200.0.

```
for (i in 1:5) {
dataframe_Q4$y[i] = dataframe_Q4$y_predicted[i]+dataframe_Q4$residuals[i]
}
```

Question 4.2

I created a plot with the x axis from 0 to 25 and the y axis from 0 to 250.

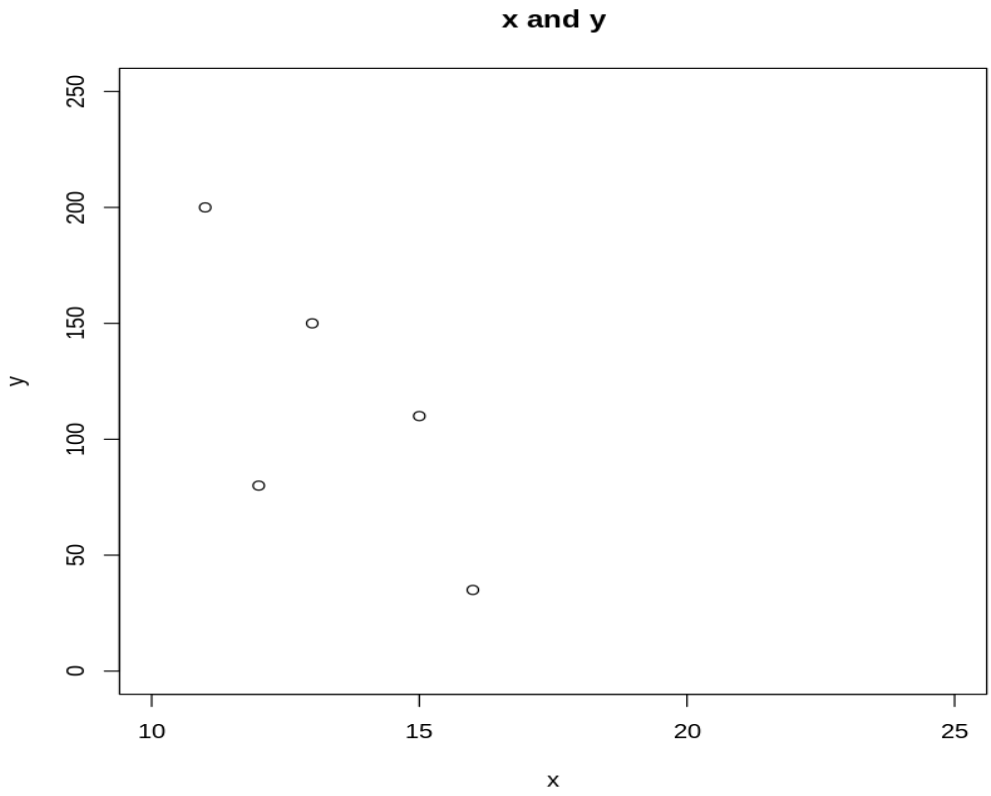
```
plot(dataframe_Q4$x, dataframe_Q4$y,
     main = "x and y",
     xlab = "x",
     ylab = "y",
     xlim = c(0,25),
     ylim = c(0,250),
)
```



Question 4.3

I created a plot with the range of the x-axis from 10 to 25 and the y-axis from 0 to 250.

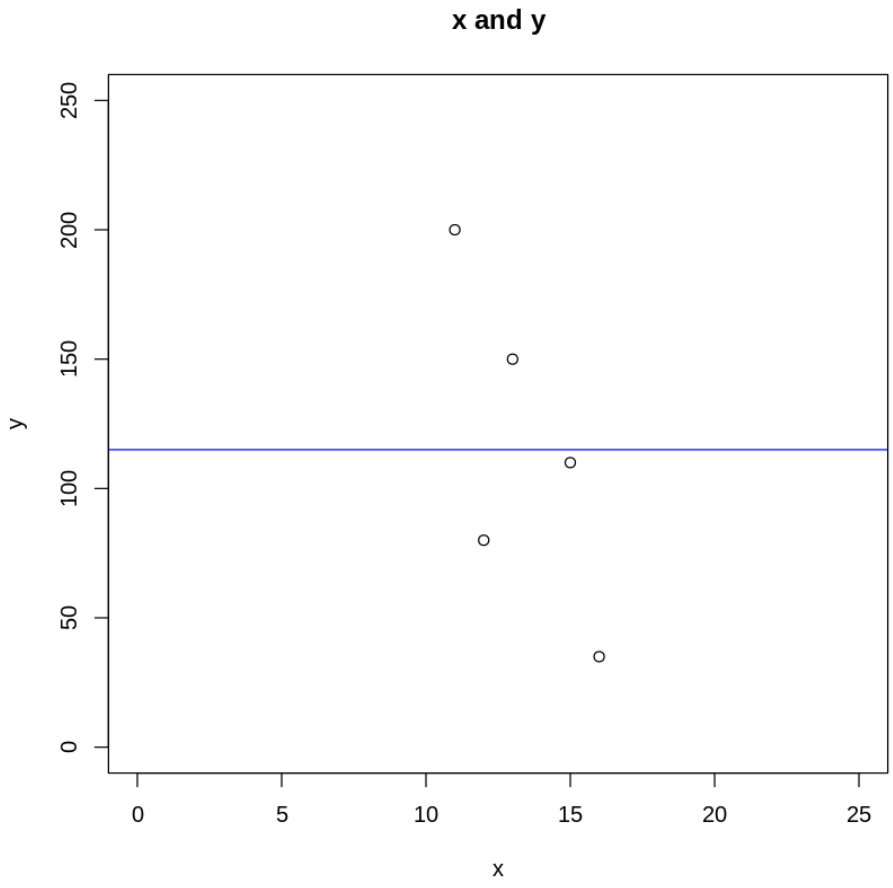
```
plot(dataframe_Q4$x, dataframe_Q4$y,
     main = "x and y",
     xlab = "x",
     ylab = "y",
     xlim = c(10,25),
     ylim = c(0,250),
)
```



Question 4.4

I created a trend line based only on the y mean, which is 115.

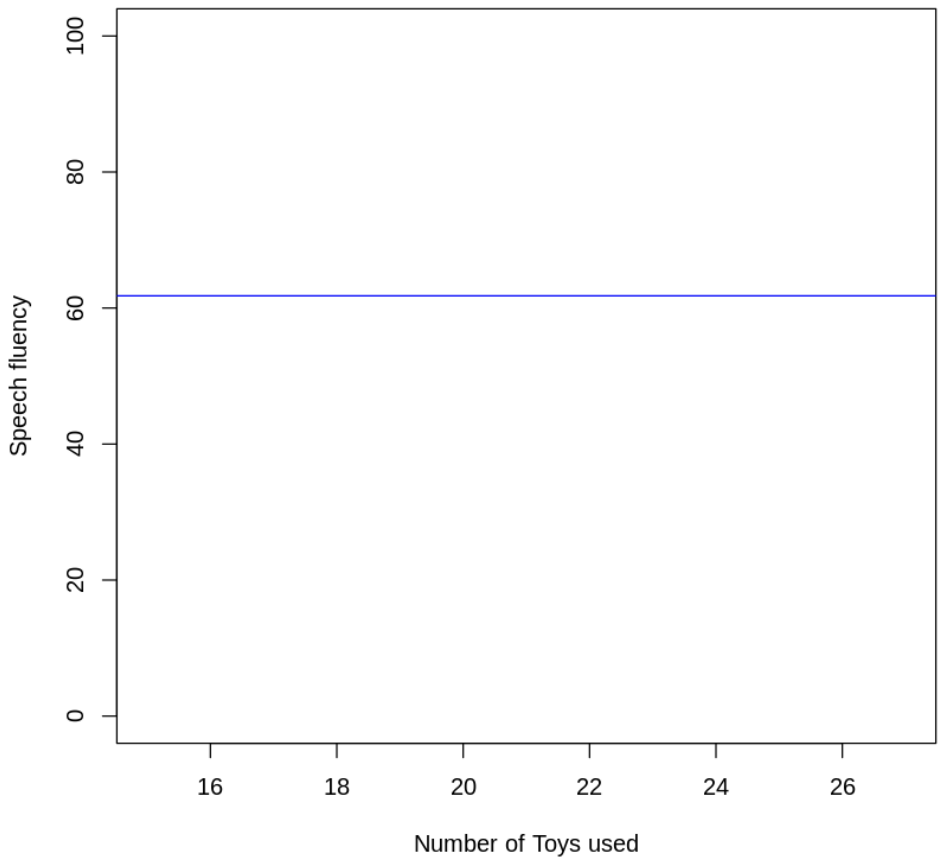
```
plot(dataframe_Q4$x, dataframe_Q4$y,
     main = "x and y",
     xlab = "x",
     ylab = "y",
     xlim = c(0,25),
     ylim = c(0,250),
)
abline(h= 115, col = "blue")
```



Question 5.1

I created a plot that places a best guess trend line given the information provided.

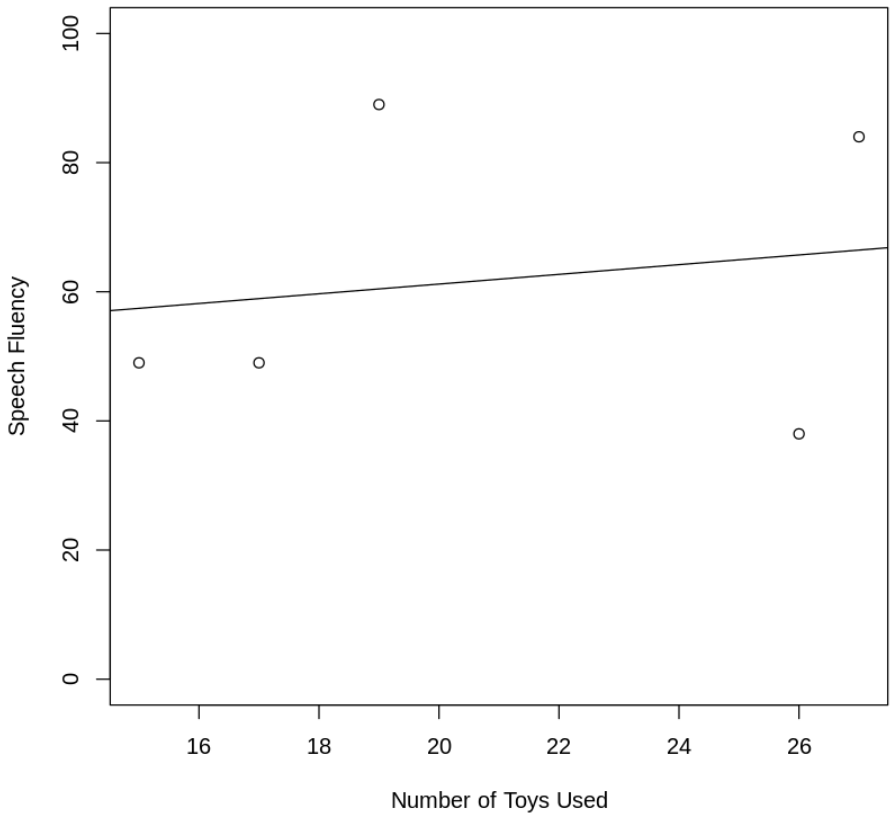
```
dataframe_Q5 = data.frame(
 number_of_toys_used= c(15,26,27,17,19),
 Speech_fluency= NaN
              )
speech_fluency_mean = 61.8

plot(dataframe_Q5$number_of_toys_used,
    xlim = range(dataframe_Q5$number_of_toys_used),
    ylim = c(0,100),
    xlab = "Number of Toys used",
    ylab = "Speech fluency",
       )
abline(h=speech_fluency_mean, col = "blue")
```



Question 5.2

Using the values (49,38,84,49,89) , I created a trend line using the lm() command. The intercept value is 46.1644 and the slope is .7517.

```
dataframe_Q5$Speech_fluency = c(49, 38, 84, 49, 89)
plot(dataframe_Q5$number_of_toys_used,dataframe_Q5$Speech_fluency,
    xlim = range(dataframe_Q5$number_of_toys_used),
    ylim = c(0, 100),
    xlab = "Number of Toys Used",
    ylab = "Speech Fluency")

fit = lm(  dataframe_Q5$Speech_fluency~dataframe_Q5$number_of_toys_used)
abline(fit)
fit

Call:
lm(formula = dataframe_Q5$Speech_fluency ~
dataframe_Q5$number_of_toys_used)

Coefficients:
                      (Intercept)  dataframe_Q5$number_of_toys_used
                          46.1644                            0.7517
```



Question 5.3 and Question 5.4

The abline (h= < value >) would create a horizontal line along the y-intercept. Additionally, the abline (v= < value >) would create a vertical line along the x-intercept.