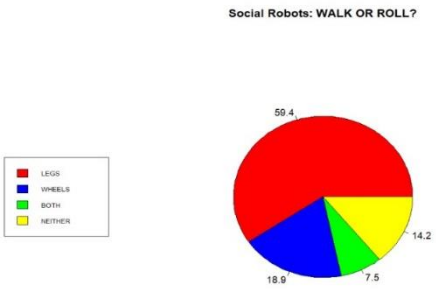
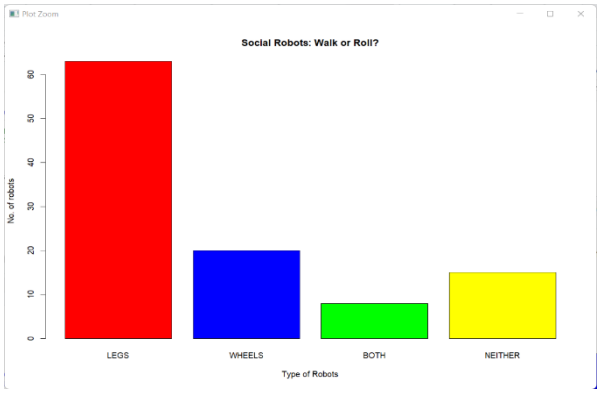
Eman Furrukh Section: U i21-1726

Probability and Statistics

Assignment #2

Q1)

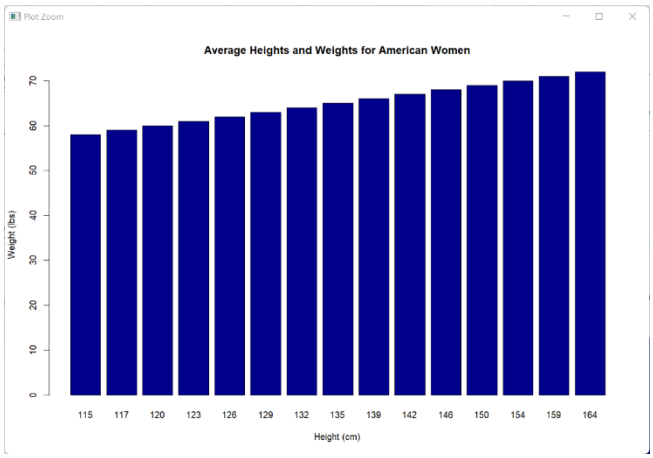




a. We can conclude that most Social Robots i.e., 59.4% use their Legs. We've also gathered that the Robots that use both Legs and Wheels are the least in number with 8 in total, forming 7.5% of the total population. Social Robots who use just their Wheels amount to 18.9% and Social Robots who have neither Legs nor Wheels amount to 14.2% .
b. The Barplot shows how much Robots with Legs dominates the charts, and how Robots with both Legs and Wheels fall at the bottom of the bunch. It shows the frequency on the y-axis and the type of robot on the x-axis.

Q2)

a. This bar-chart which consists of Height in cm on the x-axis and weight in kg on the y-axis, shows us the average weight and height of women living in America.



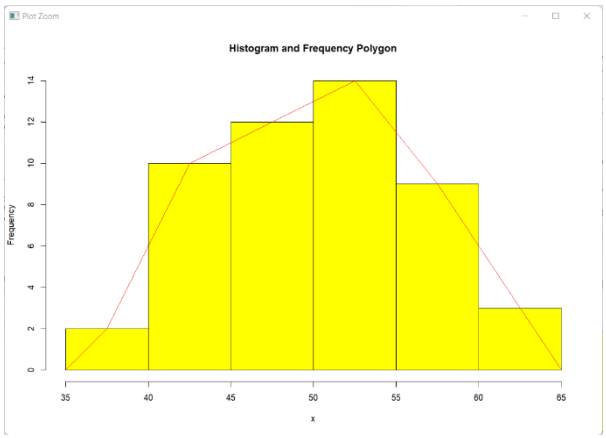
```
> summary(diamonds)
     carat               cut        color        clarity          depth      
 Min.   :0.2000   Fair      : 1610   D: 6775   SI1     :13065   Min.   :43.00  
 1st Qu.:0.4000   Good      : 4906   E: 9797   VS2     :12258   1st Qu.:61.00  
 Median :0.7000   Very Good:12082   F: 9542   SI2     : 9194   Median :61.80  
 Mean   :0.7979   Premium   :13791   G:11292   VS1     : 8171   Mean   :61.75  
 3rd Qu.:1.0400   Ideal     :21551   H: 8304   VVS2    : 5066   3rd Qu.:62.50  
 Max.   :5.0100                     I: 5422   VVS1    : 3655   Max.   :79.00  
                                    J: 2808   (Other): 2531                  
     table       
 Min.   :43.00  
 1st Qu.:56.00  
 Median :57.00  
 Mean   :57.46  
 3rd Qu.:59.00  
 Max.   :95.00  

     price             x                y                z          
 Min.   :  326   Min.   : 0.000   Min.   : 0.000   Min.   : 0.000  
 1st Qu.:  950   1st Qu.: 4.710   1st Qu.: 4.720   1st Qu.: 2.910  
 Median : 2401   Median : 5.700   Median : 5.710   Median : 3.530  
 Mean   : 3933   Mean   : 5.731   Mean   : 5.735   Mean   : 3.539  
 3rd Qu.: 5324   3rd Qu.: 6.540   3rd Qu.: 6.540   3rd Qu.: 4.040  
 Max.   :18823   Max.   :10.740   Max.   :58.900   Max.   :31.800  
```

b. To summarize, the mean of carats that is, 0.7979kg of diamond, corresponds to $3933 in price. Moreover, the median of carats in diamond is 0.7000 which corresponds to $2401 in price. The most important factor in determining the price of a diamond would the volume of carats, as well as how nicely it was cut. The more volume there is, the higher it will cost, and the quality of the cut, also determines how much volume there is, which then increases or decreases the price of the diamond.

Q3)

```
> print(fd)
    x Freq Relative_Freq Cumulative_Freq Cumulative_Relative_Freq
35 35    1          0.02               1                     0.02
39 39    1          0.02               2                     0.04
41 41    1          0.02               3                     0.06
42 42    1          0.02               4                     0.08
43 43    4          0.08               8                     0.16
44 44    2          0.04              10                     0.20
45 45    2          0.04              12                     0.24
46 46    4          0.08              16                     0.32
48 48    3          0.06              19                     0.38
49 49    1          0.02              20                     0.40
50 50    4          0.08              24                     0.48
51 51    1          0.02              25                     0.50
52 52    1          0.02              26                     0.52
53 53    4          0.08              30                     0.60
54 54    4          0.08              34                     0.68
55 55    4          0.08              38                     0.76
56 56    3          0.06              41                     0.82
57 57    1          0.02              42                     0.84
58 58    1          0.02              43                     0.86
59 59    2          0.04              45                     0.90
60 60    2          0.04              47                     0.94
61 61    1          0.02              48                     0.96
62 62    1          0.02              49                     0.98
63 63    1          0.02              50                     1.00
> 
```



a. This shows the frequency distribution table of the random 50 values assigned by using rnorm function. This shows the values, their frequency, cumulative frequency, relative frequency, and cumulative relative frequency.

b. This shows the Histogram and a Frequency Polygon superimposed onto the Histogram. This displays the previous frequency distribution done in part a in plot form. The y-axis consists of the frequency and the x-axis shows the class width.

Q4)

```
> summary(x["Country/Region"])
 Country/Region
 Length:306429
 Class :character
 Mode  :character
> summary(x["Confirmed"])
   Confirmed
 Min.    :-302844
 1st Qu.:   1042
 Median :  10375
 Mean   :  85671
 3rd Qu.:  50752
 Max.    :5863138
> summary(x["Deaths"])
     Deaths
 Min.    :  -178
 1st Qu.:    13
 Median :   192
 Mean   :  2036
 3rd Qu.:  1322
 Max.    :112385
> summary(x["Recovered"])
   Recovered
 Min.    :-854405
 1st Qu.:     11
 Median :   1751
 Mean   :  50420
 3rd Qu.:  20270
 Max.    :6399531
> summary(x["Province/State"])
 Province/State
 Length:306429
 Class :character
 Mode  :character
> summary(x["ObservationDate"])
 ObservationDate
 Min.    :2020-01-22 00:00:00.00
 1st Qu.:2020-07-30 00:00:00.00
 Median :2020-11-10 00:00:00.00
 Mean   :2020-11-06 01:54:54.15
 3rd Qu.:2021-02-18 00:00:00.00
 Max.    :2021-05-29 00:00:00.00
```

c. The mean for Confirmed covid cases amounts to 85,671 people. Whereas the median amounts to 10,375. For the Deaths due to covid, the mean is 2,036 and the median is 192. Moreover, the Recovery cases consists of an average mean of 50,420 and a median of 1,751. Considering the dates which contained the highest covid cases, we have the 6th of November 2020 and the 10th of November 2020. The most occurring Country/Region was Russia and there was no specific mode for Province/State.