1. How many patients have heart disease?

Ans. 101

2. What is the average Cholesterol level of people with heart disease and without heart disease? What is the standard deviation?

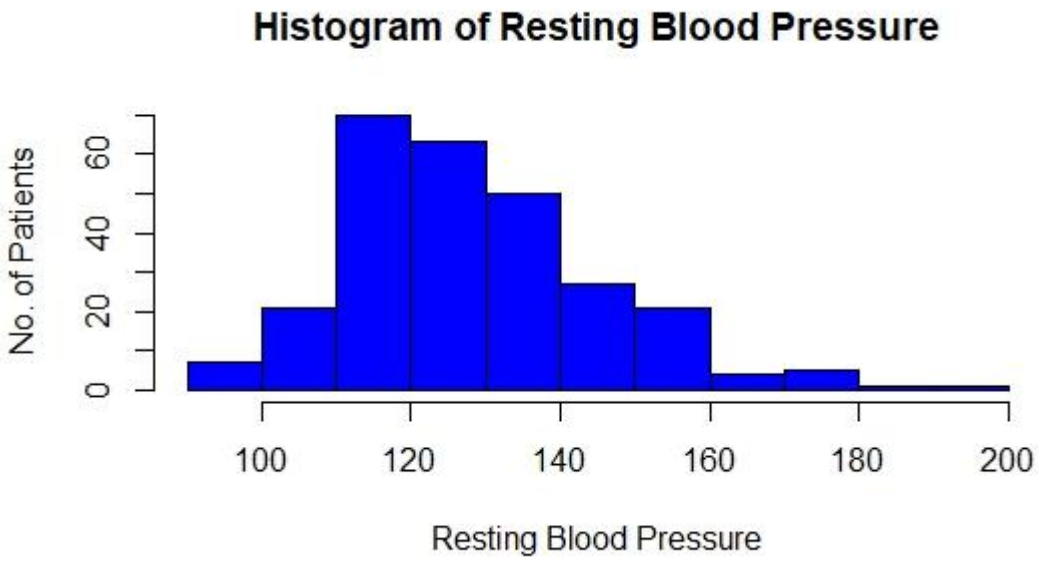
Ans. 2.1 Average Cholesterol level of people with heart disease: 269.1881
Average Cholesterol level of people without heart disease: 239.9529
2.2 Standard deviation of everyone's cholesterol: 67.65771
Standard deviation with heart problem: 79.91116
Standard deviation without heart problem: 56.69453

3. What is the median and average age of people with cholesterol higher than 240.0, higher than 240.**0** with heart disease, higher than 240.**0** without heart disease?

Ans. 3.1 Median and Average age of people with cholesterol higher than 240: 49 and 48.35252
3.2 Median and Average age of people with cholesterol higher than 240 and heart disease: 50 and 49.41935
3.3 Median and Average age of people with cholesterol higher than 2400 and no heart disease: 48 and 47.49351

4. Create a histogram of resting blood pressure.

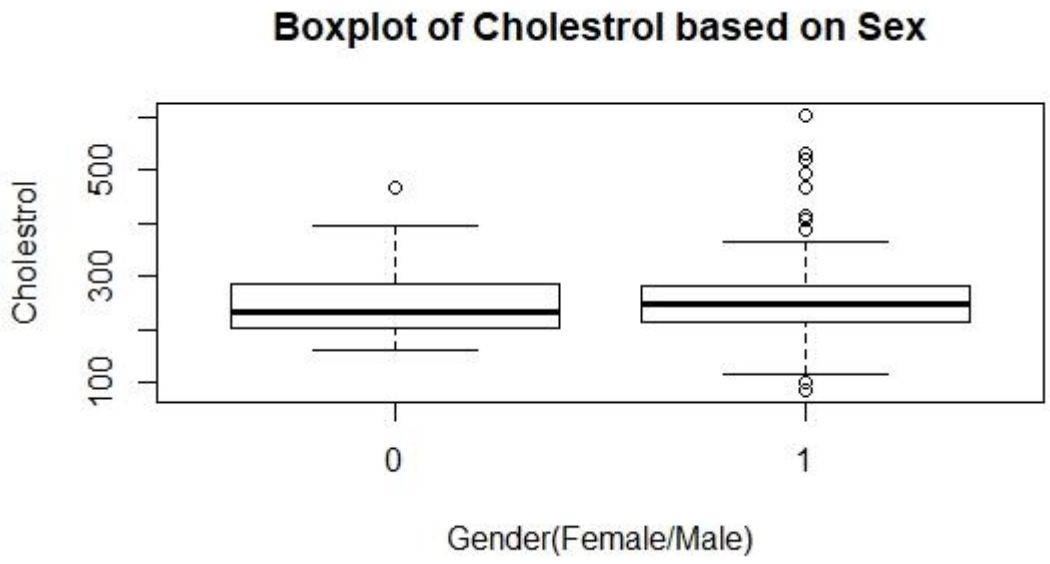
Ans.



5.Create boxplots based on the **sex** of the patients for the following attributes:

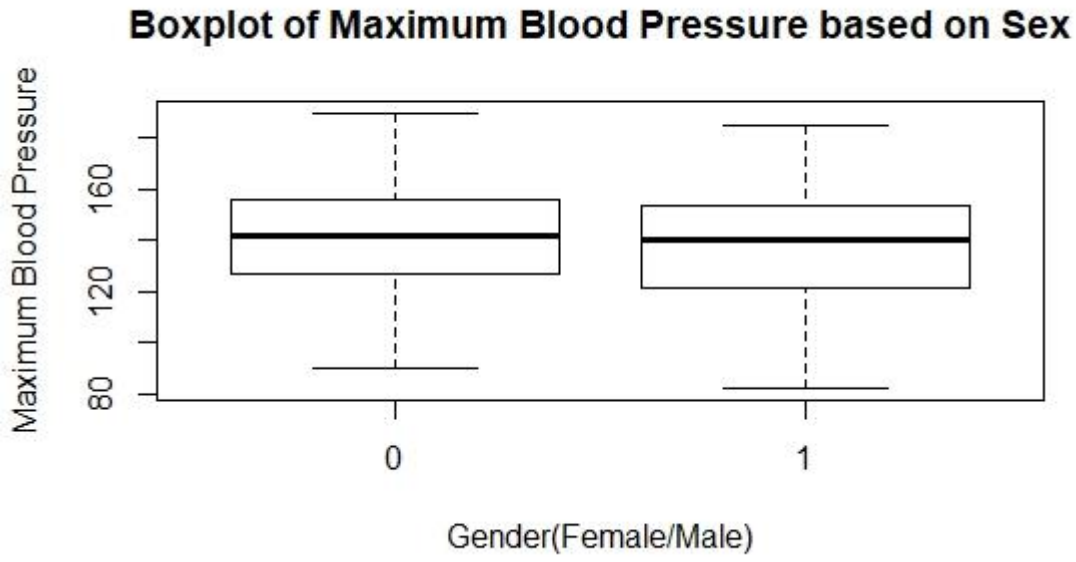
1.
    1. cholesterol level

    Ans.



    2. maximum heart rate achieved

    Ans.



6. For each Box plot, answer the following questions:
   1. What is the H-Spread (Q3-Q1) of cholesterol level for male and females?

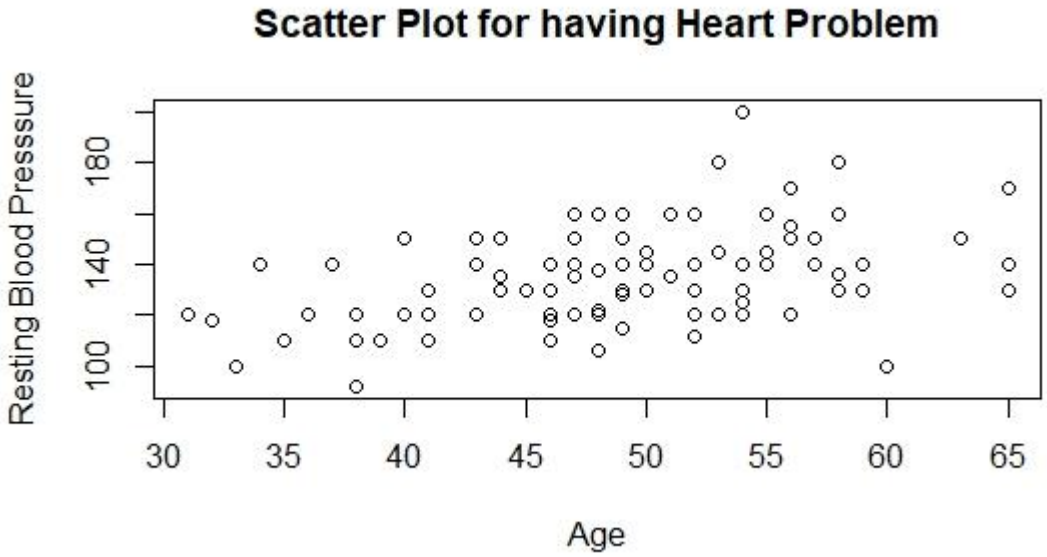
   Ans. H-Spread (Q3-Q1) of cholesterol level for male and females: 70 and 81.5

   2. What are the Lower Hinge and Upper Hinge values for maximum heart rate for male and female?

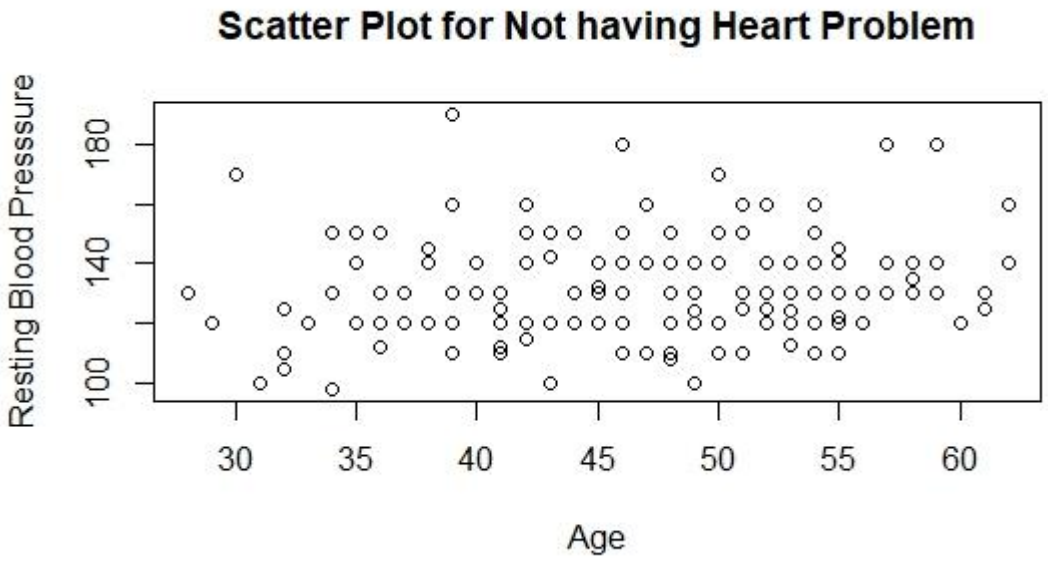
   Ans. Lower Hinge and Upper Hinge values for maximum heart rate for male: 121 And 154
   Lower Hinge and Upper Hinge values for maximum heart rate for female: 127 and 156

7. In order to find if two attributes are related and their values change together, we can use **Scatter plot**. Follow the instruction below and answer the questions:
   1. Create two scatter plots of **age** and **resting blood pressure** for people with heart disease and without heart disease. Is there any visual correlation?

   Ans. Scatter plot of patients having heart disease shows a weak positive correlation.



Scatter plot of patients not having heart problem do not show any correlation.

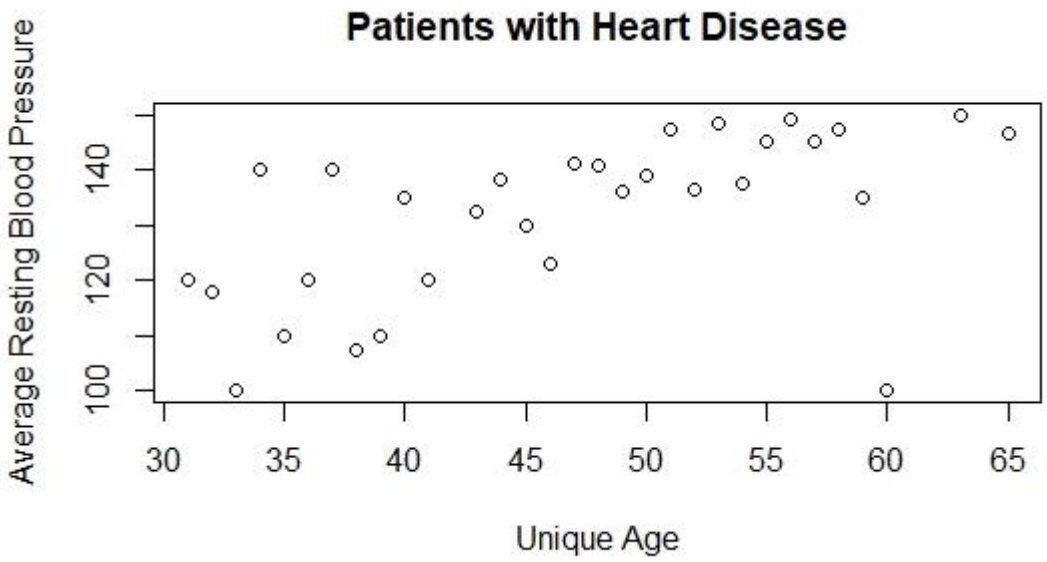


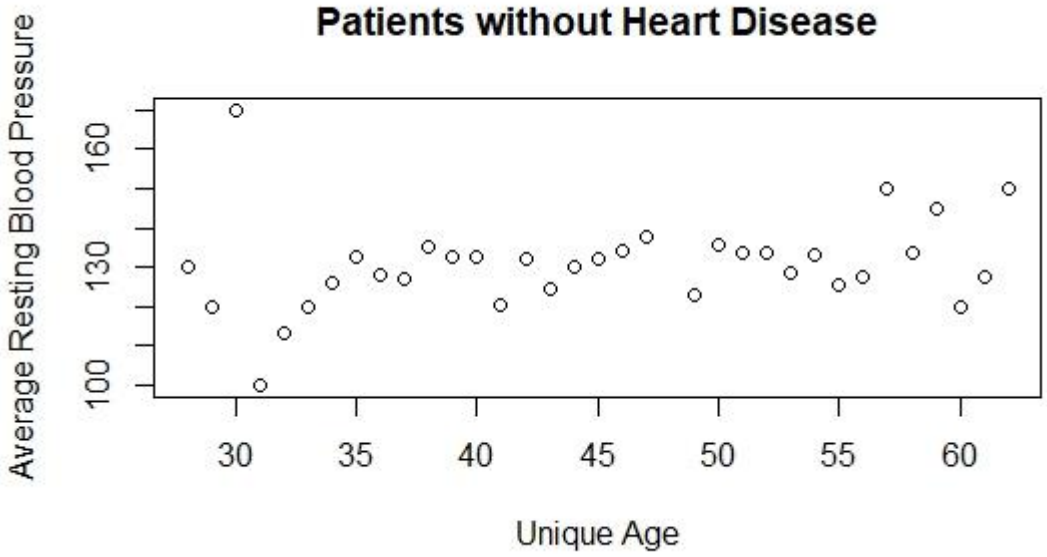
2. Calculate the average resting blood pressure of each age (HINT : Use Group by for **age**) for people with heart disease. Calculate the average resting blood pressure of each age (HINT : Use Group by for **age**) for people without heart disease.

Ans. 130.7346 and 131.8955

3. Now create two scatter plots using the previous results. Do you see a pattern now? Do people without heart disease have higher blood pressure as they age than people with heart disease?

Ans.





8. Compare the resting blood pressure of people with heart disease and without.

Ans. Patients without heart disease:

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
98.0	120.0	130.0	130.5	140.0	190.0	1

Patients with heart disease:

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
92.0	120.0	135.0	135.7	150.0	200.0