PIMPRI CHINCHWAD EDUCATION TRUST'S

PIMPRI CHINCHWAD COLLEGE OF ENGINEERING

Department of Information Technology

Report of Project

Subject: Statistical Data Analysis using R

Academic Year 2022-23

Semester III

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Project Title: Descriptive analysis of HR Employee data of Company

Data used: HR data from

Details of the data : Data contains 1470 observation and 35 variables as follows

0 Age of Employee

1 Attrition[Yes/No]

2 BusinessTravel–How frequently does the employee travels

3 DailyRate–Daily rate of employees

4 Department–Department in which employee is working

5 DistanceFromHome—How far is the home of employee from office

6 Education–Education of employee

7 EducationField–Field of education of employee

8 EmployeeCount

9 EmployeeNumber-Serial number of employee

10 EnvironmentSatisfaction-Satisfaction of environment of office

11 Gender-Gender of employee

12 HourlyRate–Hourly rate

13 JobInvolvement-Involvement in job

14 JobLevel-Level of job

15 JobRole–Type of job

16 JobSatisfaction–Satisfaction of job

17 MaritalStatus–Marital status of employee

18 MonthlyIncome-Monthly income of employee

19 MonthlyRate–Monthly rate

20 NumCompaniesWorked-Number of companies employee has worked with

21 Over 18-Is age of employee greater than 18

22 OverTime-Does employee do overtime

24 PerformanceRating-Rating of employee

25 RelationshipSatisfaction-Relationship satisfaction

26 StandardHours-Standard hours of work

27 StockOptionLevel-Stock option level of employee

28 TotalWorkingYears–Total working hours

29 TrainingTimesLastYear–Total training times of employee in last year

30 WorkLifeBalance–Work life balance of employee

31 YearsAtCompany–Working years at company

32 YearsInCurrentRole–Years in current role

33 YearsSinceLastPromotion–Years since employee has been promoted

34 YearsWithCurrManager-Working years with current manager

Problem statement 1: Are the people having less Monthly Income leaving the company?

- Here,we plotted the boxplot between attrition and monthly income of the employees.
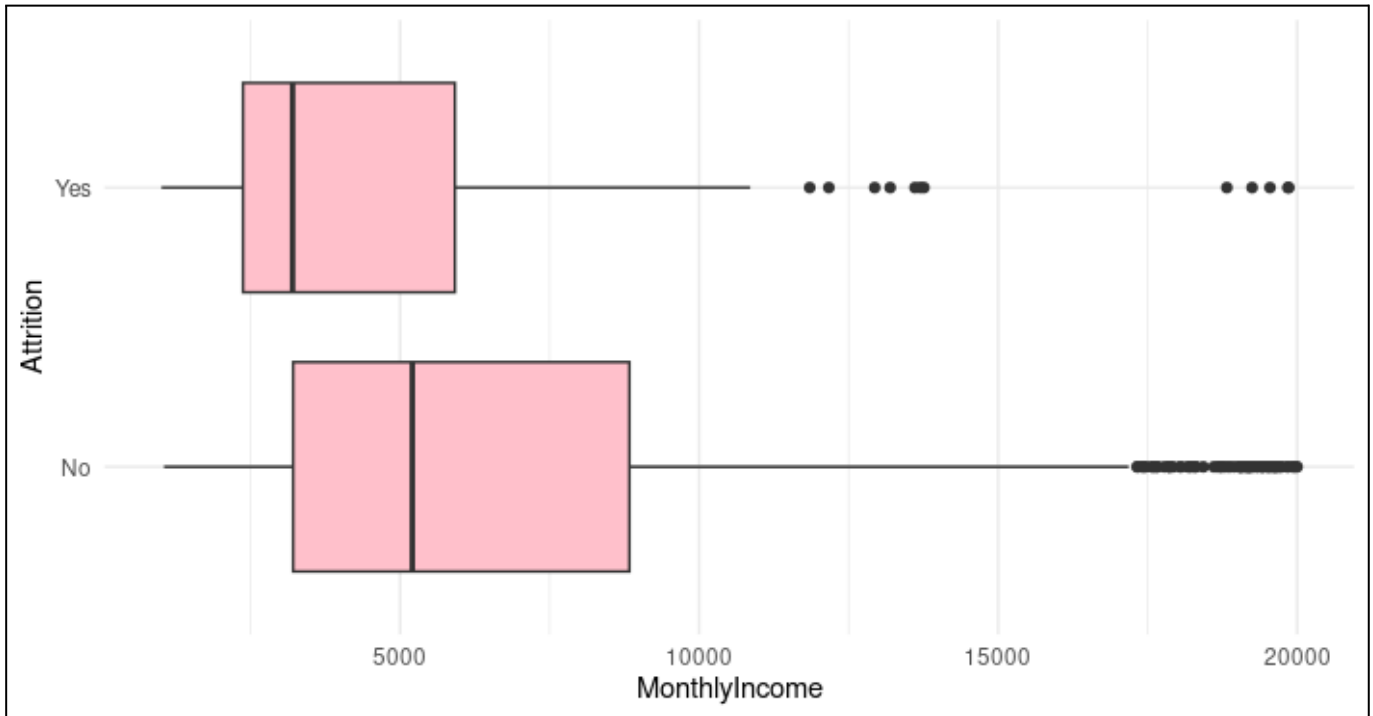

- We can see that the average salary of employees leaving the company is less than the employees staying in the company.
- It shows that people having less Monthly Income are leaving the company.
- If a company is experiencing high levels of employee turnover due to low salaries, it may be an indication that the company's pay structure needs to be reevaluated and potentially adjusted in order to retain valuable employees

Attrition	No of Employees Having less than 18000 Income	No of Employees Having greater than 18000 Income
Yes	232	5
No	1170	64

- From the above table we can understand that the Employees having less Salaries are leaving but Many Employees although they having less salary they are not leaving that means many of the employees money issues or poor education degree and many other things

## Problem statement 2:How does the monthly income vary with the job role ?

- Here,we plotted the plot between monthly income and job role.
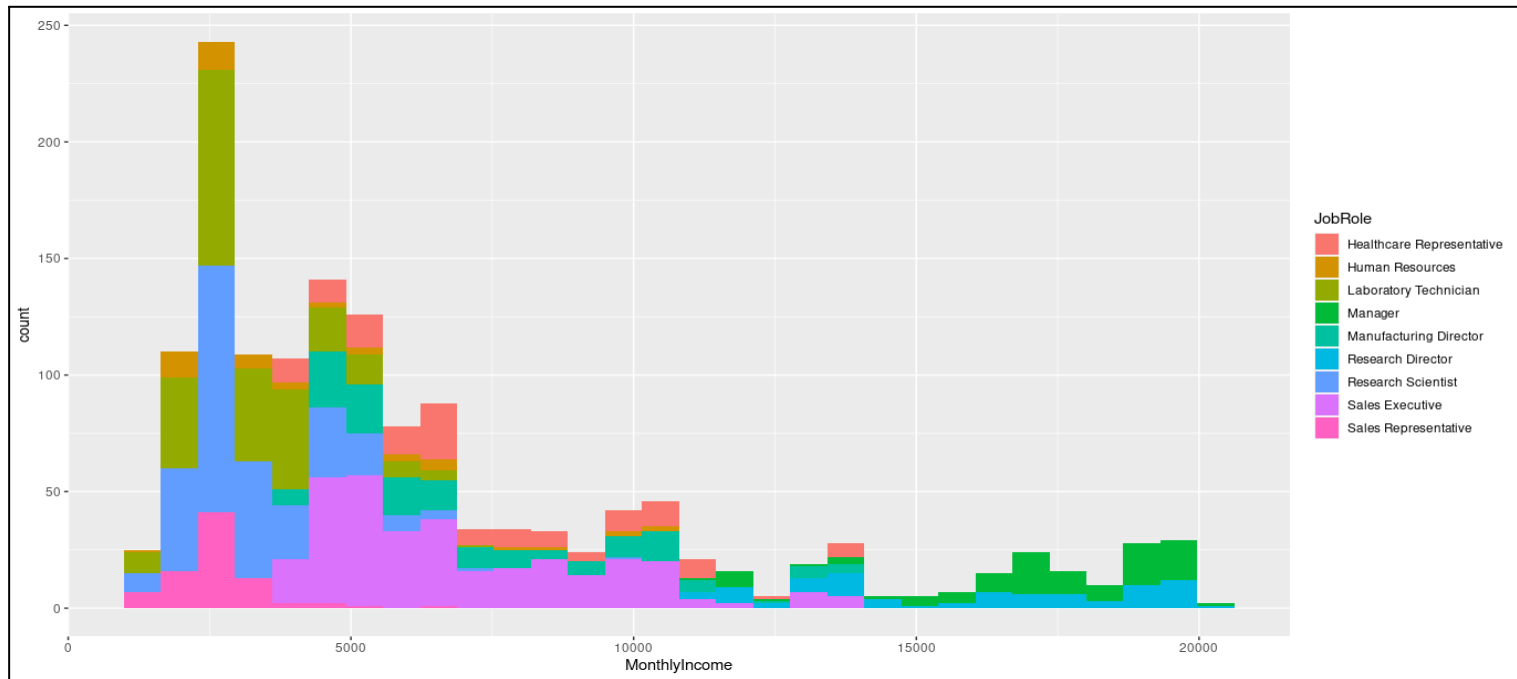
- we can clearly see that the managers and Research directors have more salaries than the other job roles.
- This is often due to the level of responsibility, expertise, and experience required for those roles

Problem statement 3: Does overtime affect a percent salary hike?

- We plotted the graph of percentage salary hike with overtime and distributed it with genders.
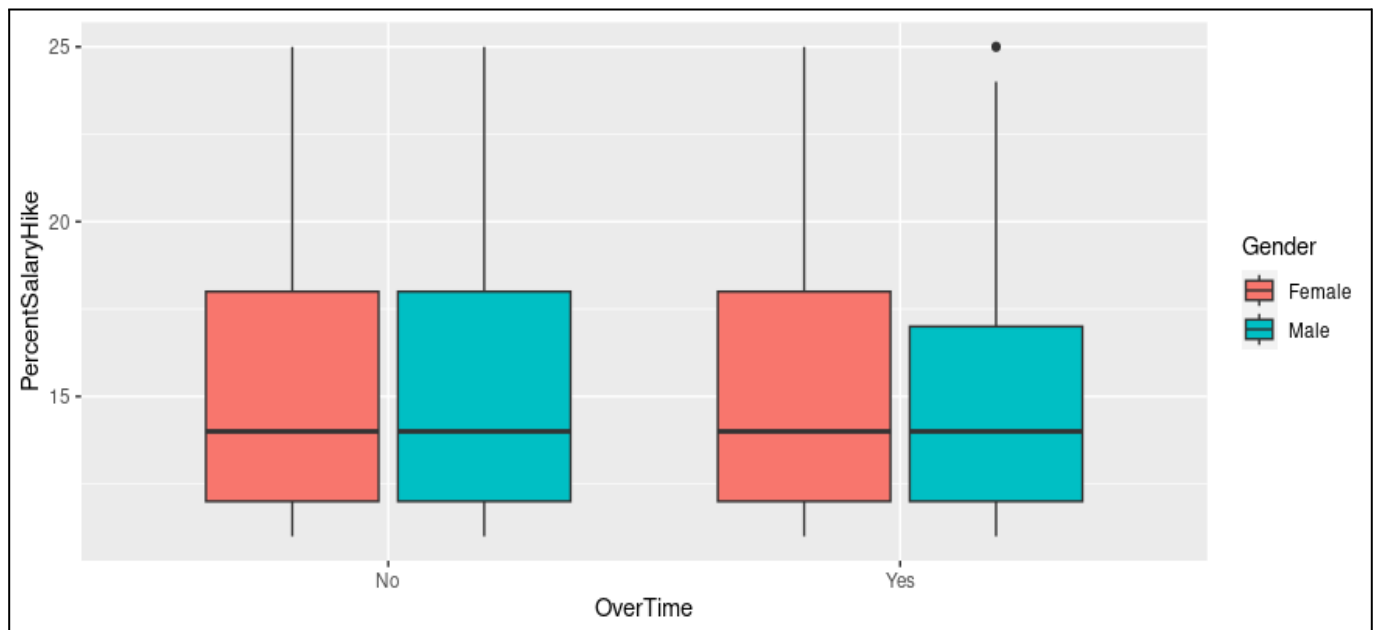
- We can see that female employees are doing more overtime than male employees
- Apart from doing more overtime, males and females have the same average salary.
- Higher hikes motivate people to work better, and stay in the organization. Hence we see the chances of an employee leaving the organization where the hike is lower, is much more than a company that gives a good hike.

OverTime	Percent Salary Hike
Yes	15.17788
No	15.22201

That means the for all employees although they are doing Overtime or not the percent salary hike is same

Problem statement 4:Do the Employees are satisfied with their Job role?

- We plotted the graph of job satisfaction with the Job role and distributed it with the Education Field.
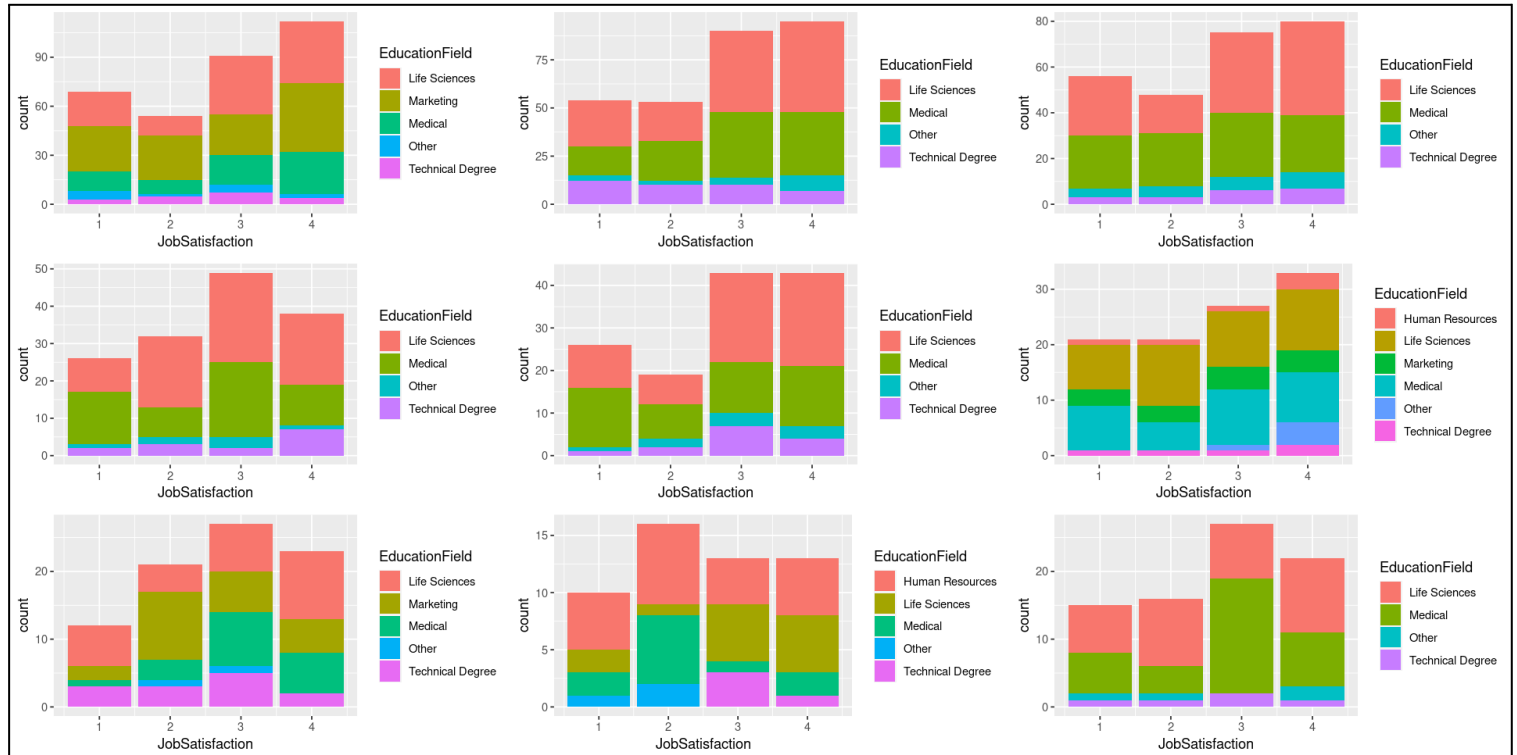
Grid info: -

(1,1) -Job satisfaction in Sales Executive   (1,2) -Job satisfaction in Research Scientist

(1,3)- Job satisfaction in Laboratory Technician

(2,1) - Job satisfaction in Manufacturing Director

**(2,2) - Job satisfaction in Healthcare Representative**

(2,3)- Job satisfaction in Manager   (3,1) - Job satisfaction in Sales Representative

(3,2) -Job satisfaction in Human Resource (3,3) - Job satisfaction in Research Director

- from the above graphs we conclude that the job satisfaction is high in employees having the same job role as their education level that means employees with marketing degree having high job satisfaction in Sale Executive and the field related to the marketing skills and managers having high satisfaction levels as compared to others

Problem statement 5:Is there a relationship between employee turnover and specific department?

- We plotted the graph ofJob Role with Attrition Rate and distributed it with Departments
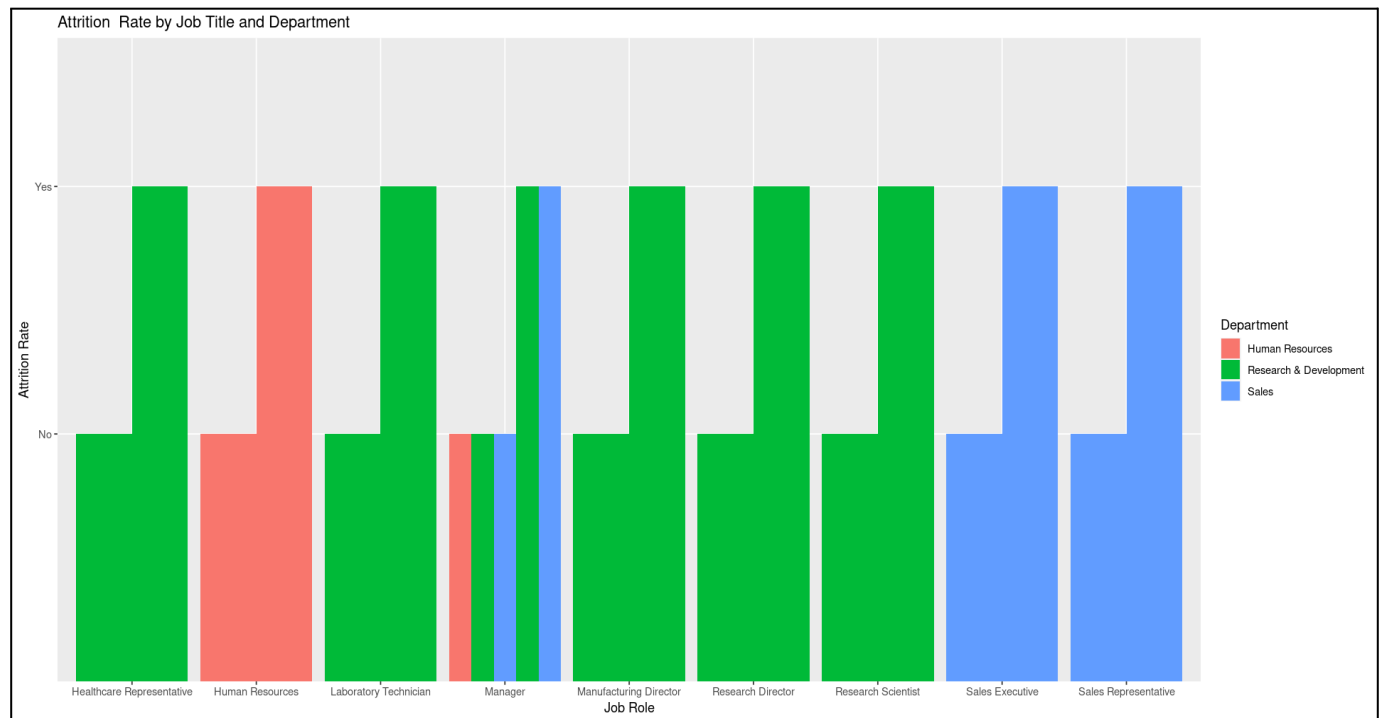
Attrition Rate by Job Title and Department

- As the attrition rate of managers in all department are same hence we can conclude that Managers are not not interested in leaving the job because of their post
- However other job roles in all departments have similar attrition rates.

Problem statement 6:Do certain demographic characteristics, such as age or gender, seem to be associated with higher or lower rates of employee Attrition?

● We plotted the graph of Attrition Rate with Age and gender
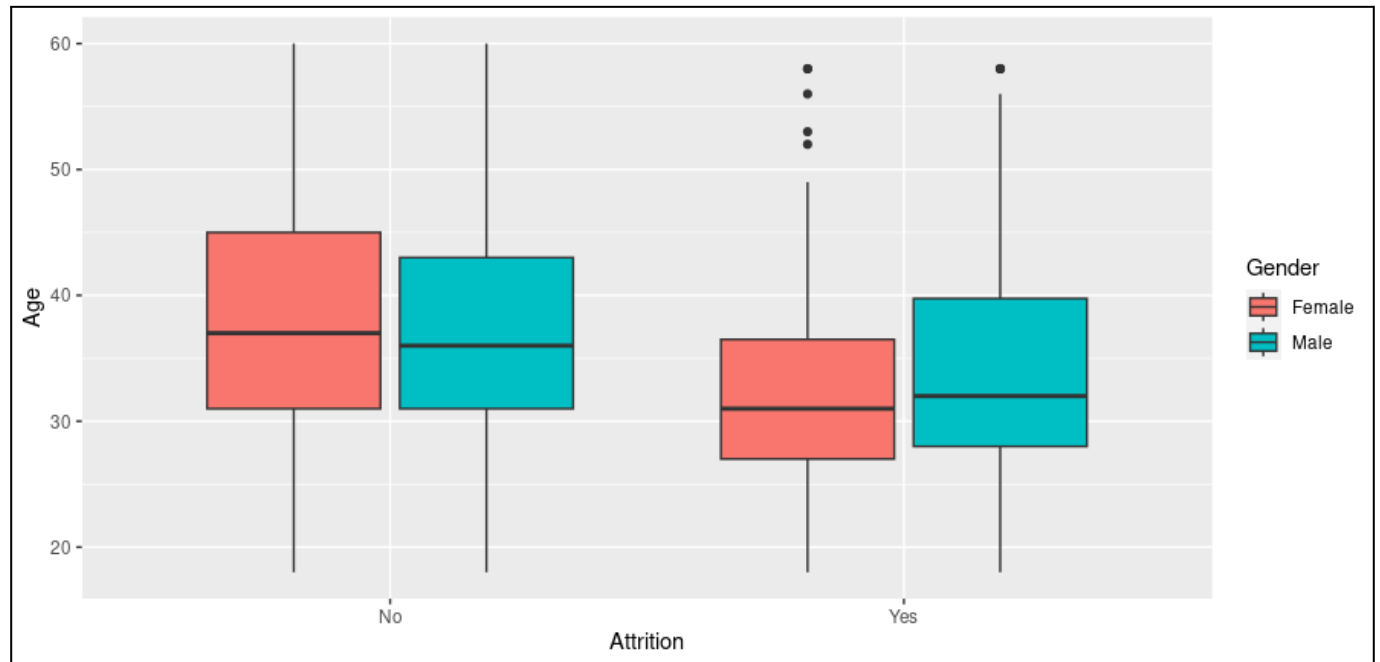
1. The Average Attrition rate in the employees shows the some variation in males and females that is in males the average age of attrition is around 30 to 35 and in the females the average age of attrition is around 35 to 40
2. So we can understand that the attrition rate high in less experience employees i.e small age and the attrition rate in the employees

	Gender	
Attrition	**Males**	**Females**
YES	150	87
NO	732	501

Problem statement 7:Find the correlation in all the factors affecting attrition ?

● We plotted the graph of Correlation in all the factors affecting the Attrition
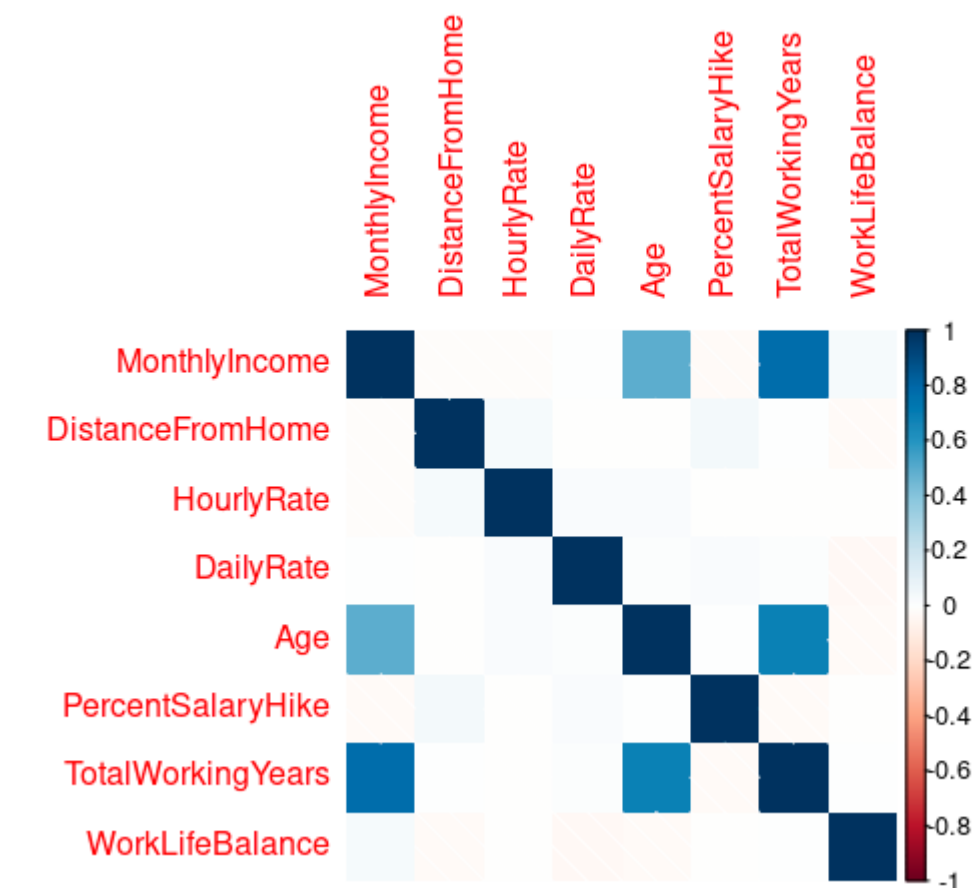
1. In the given dataset the Monthly income of the employees is shows the Dependance on the total working years that is Total Working years positively correlated with the Monthly income with the correlation value is `0.497854567`

2. That means As the Working Years of Employees are more than the Monthly income of Employees also High

3. The Monthly income is also show the small positive relationship with the Age and the correlation value is `0.497854567`

4. That means the employees having work experience are also having high chance to get more Monthly income

Overall Conclusion:

1.The average salary of employees leaving the company is less than the employees staying in the company. We can conclude that the lower salary can be the reason behind the high attrition rate.

2.The salary varies with the job role and the managers and research directors have the highest salaries.

3.Apart from doing more overtime, males and females have the same average salary.

4.As the attrition rate of managers in all department are same hence we can conclude that Managers are not not interested in leaving the job because of their post

5.Monthly income shows positive(`0.497854567`) correlation with total working years.