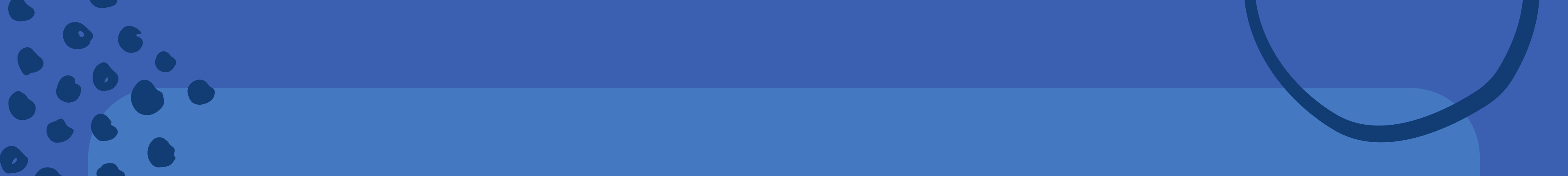# EMPLOYEE ATTRITION

A Global Challenge

"Research indicates that workers have three prime needs : Interesting work , recognition for doing a good job, and being let in on things that are going on in the company."

Zig Ziglar
(American Author)

Objectives

Attrition Percentage

Yes 16%

No 84%

A reduction in the number of employees through retirement, voluntary, resignation, or death is called Attrition. The average Attrition rate is ~20 % globally.

There are a few most important questions arise which cause the Attrition
- What's the attrition percentage
- Why do employees leave the Organization
- When do employees leave the Organization
- Does any incentive like stocks can stop or reduce the attrition
- Do we conduct an exit and stay interviews
- Do people have single or multiple reasons to leave
- Should all attrition be prevented
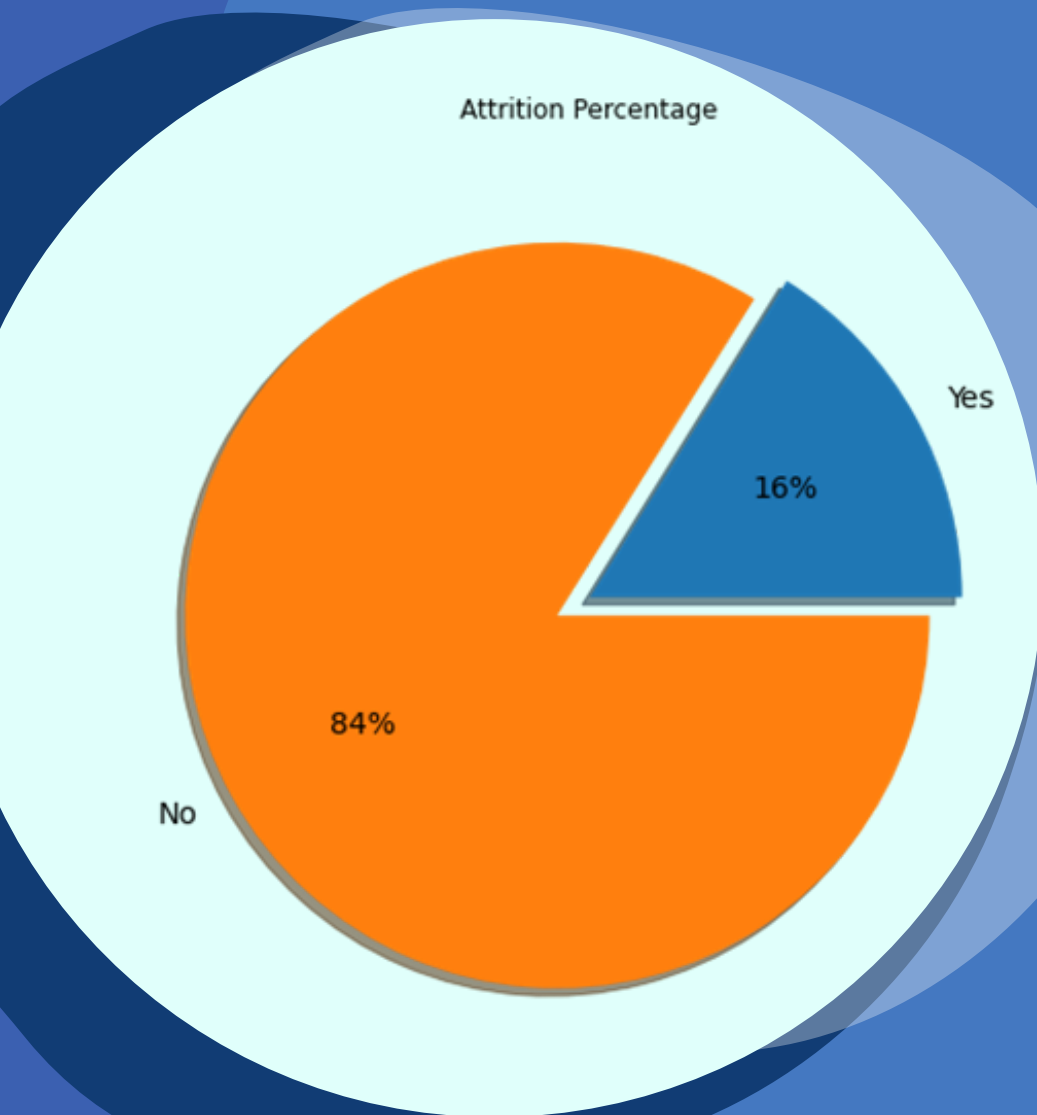
Process

We'll try to find out the answers to all the above questions using HR data.

I am going to use HR data for further analysis of Attrition. As per data, 16% of employees have left the organization. The attrition Rate is very high; as per Q420 research attrition rate was 6%, and in 2022 attrition rate surged high.

I'll perform analysis and will try to find out the potential root cause of the high attrition rate. So that rate can be reduced by rectifying the root cause.
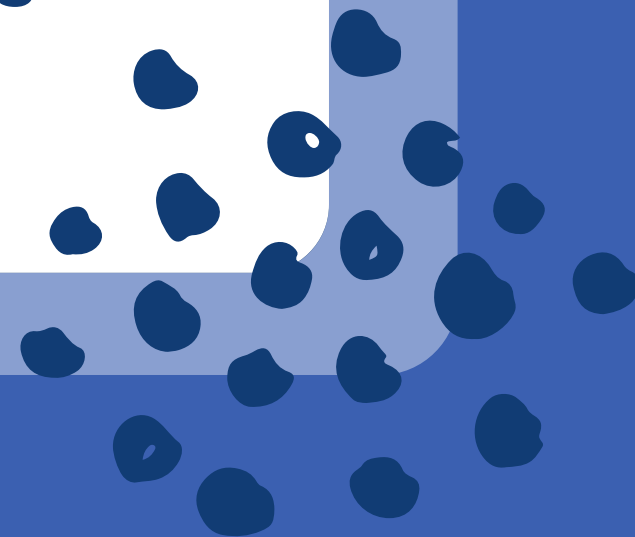
Data Cleaning

4 columns can be removed from the data as they consist of the same value which doesn't have any effect on the data.

- Standard Hours - How many hours an employee works(80)
- Employee Count - Headcount of the employee(1)
- Over18 - All the employees are over 18
- NumCompanies Worked
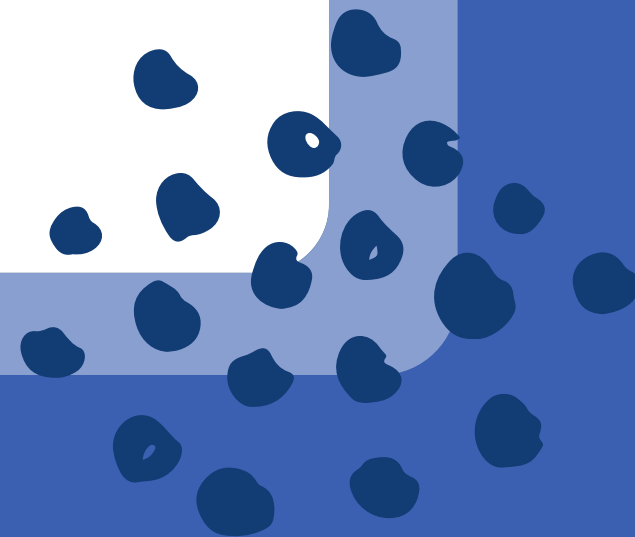
EDA

JOBS

Sales department :
- Sales Executive
- Sales Representative
- Sales Manager

Human Resources department :
- Human Resources
- Human Resources Manager

Research & Development department :
- Research Scientist
- Laboratory Technician
- Manufacturing Director
- Healthcare Representative
- Research Director
- Research Manager

Monthly income affects employee attrition. The Attrition rate is high in case of low Monthly Income
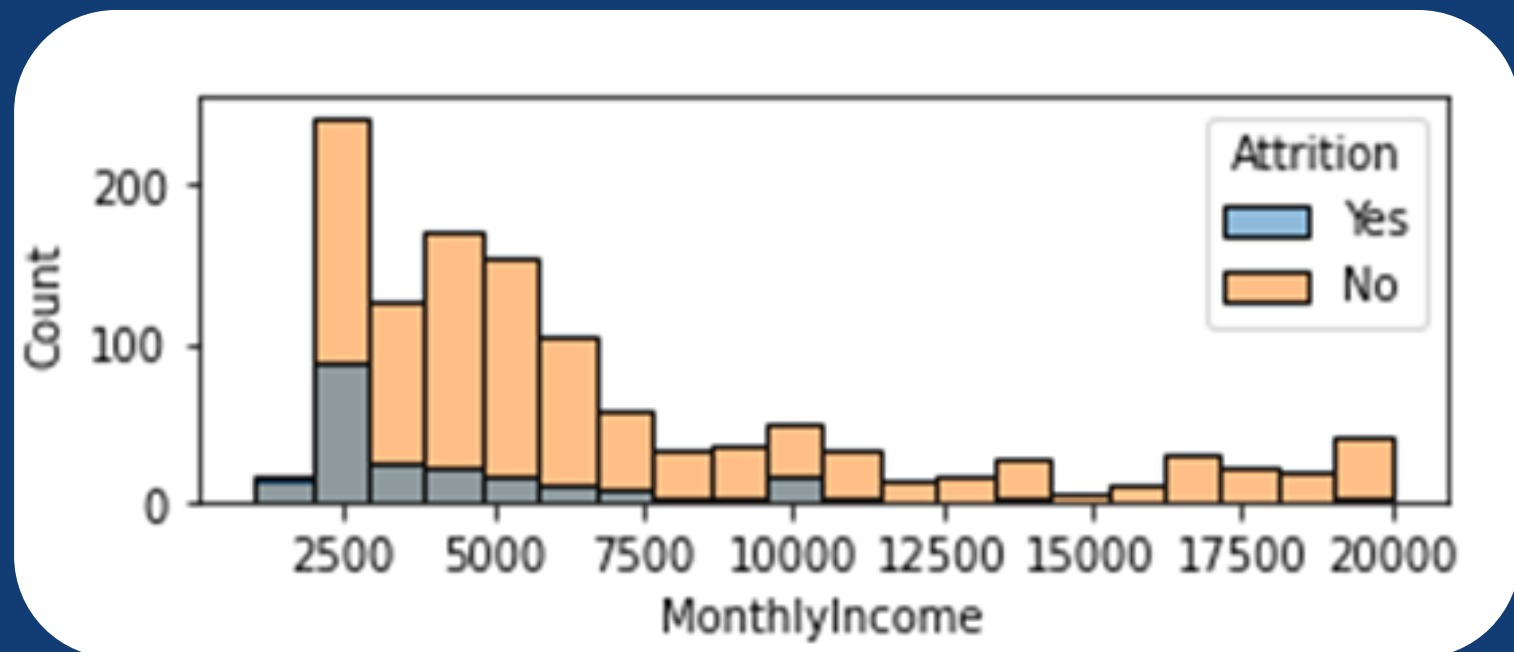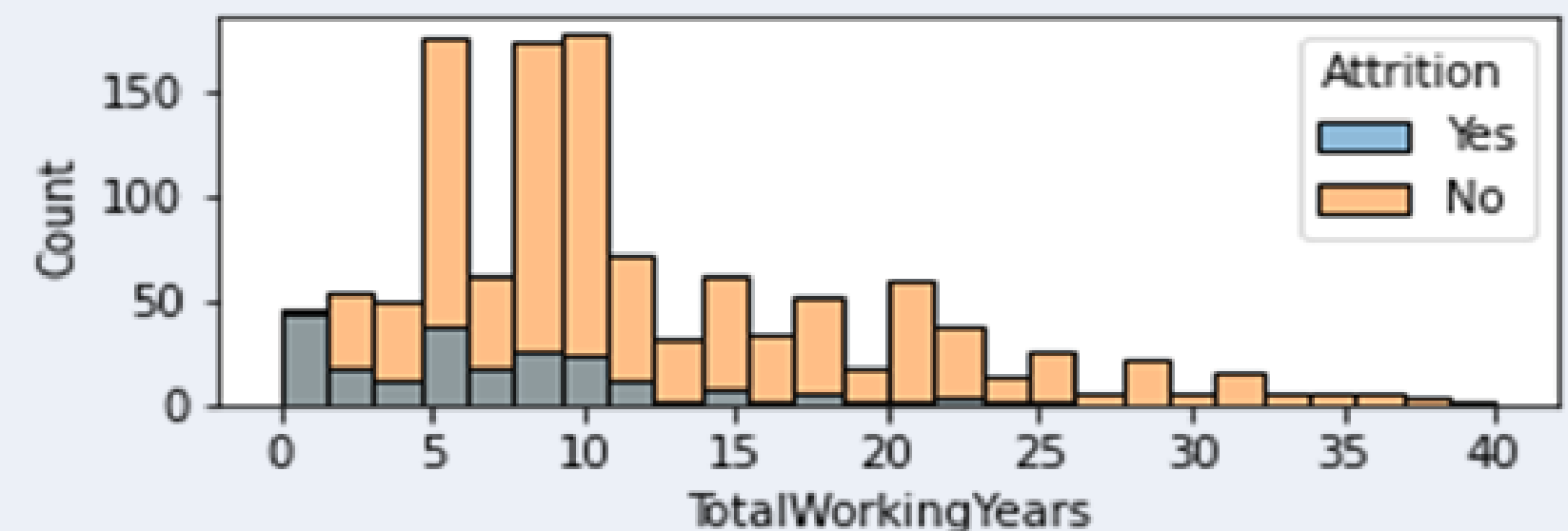
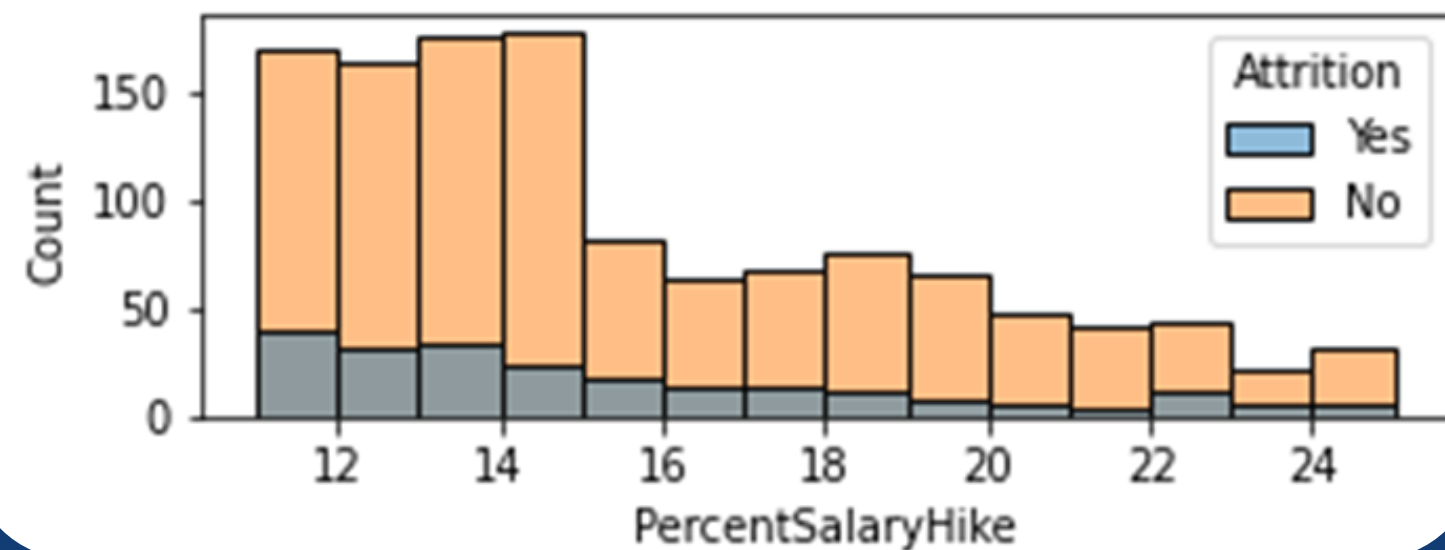**Employees leave the organization in initial years of joining the organization.**
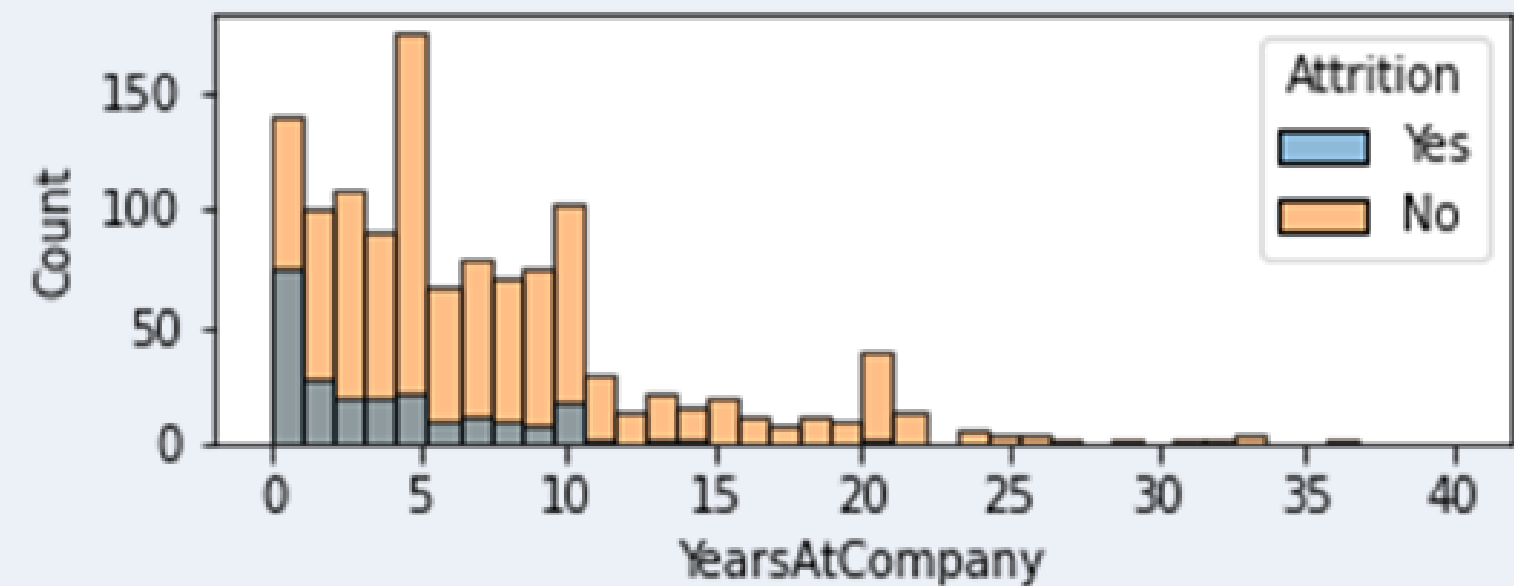
Age is noticeable in terms of Attrition, as employees grow old less tend to leave the organization. Most of employee made their attrition during their 25 to 35 age.
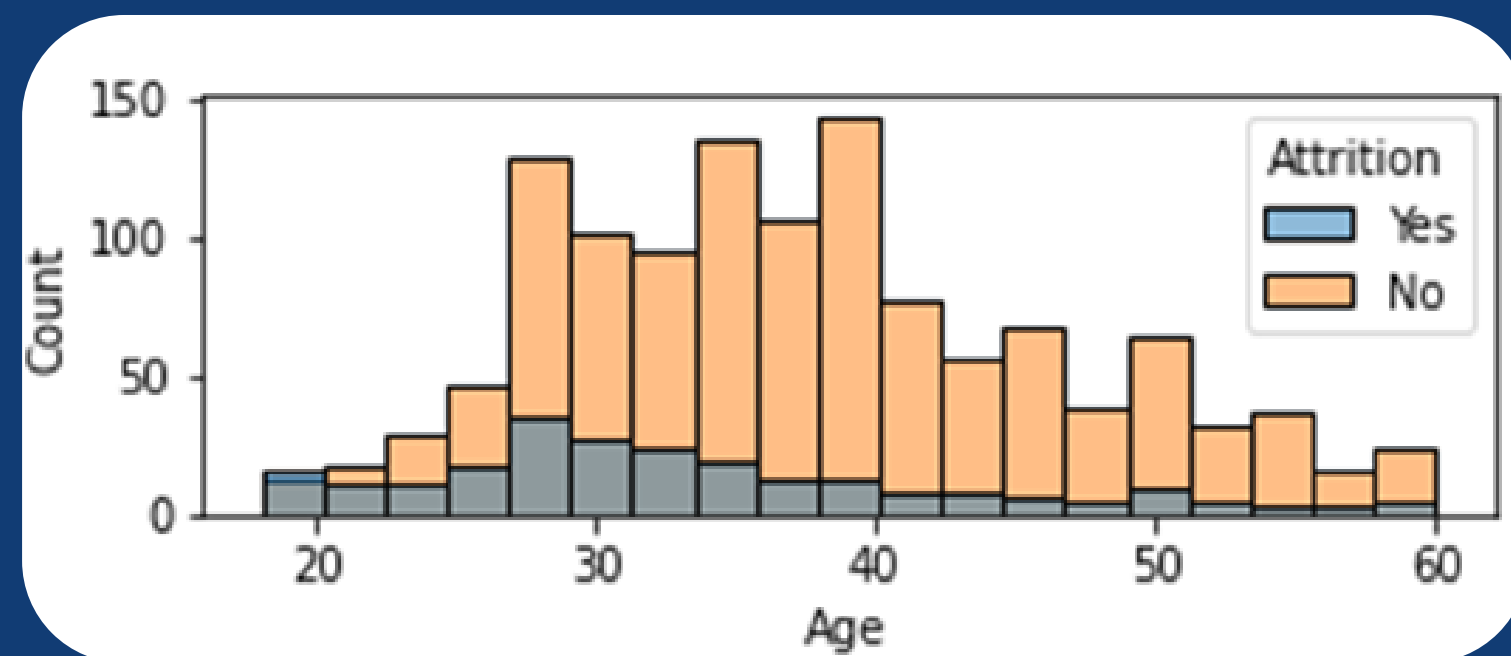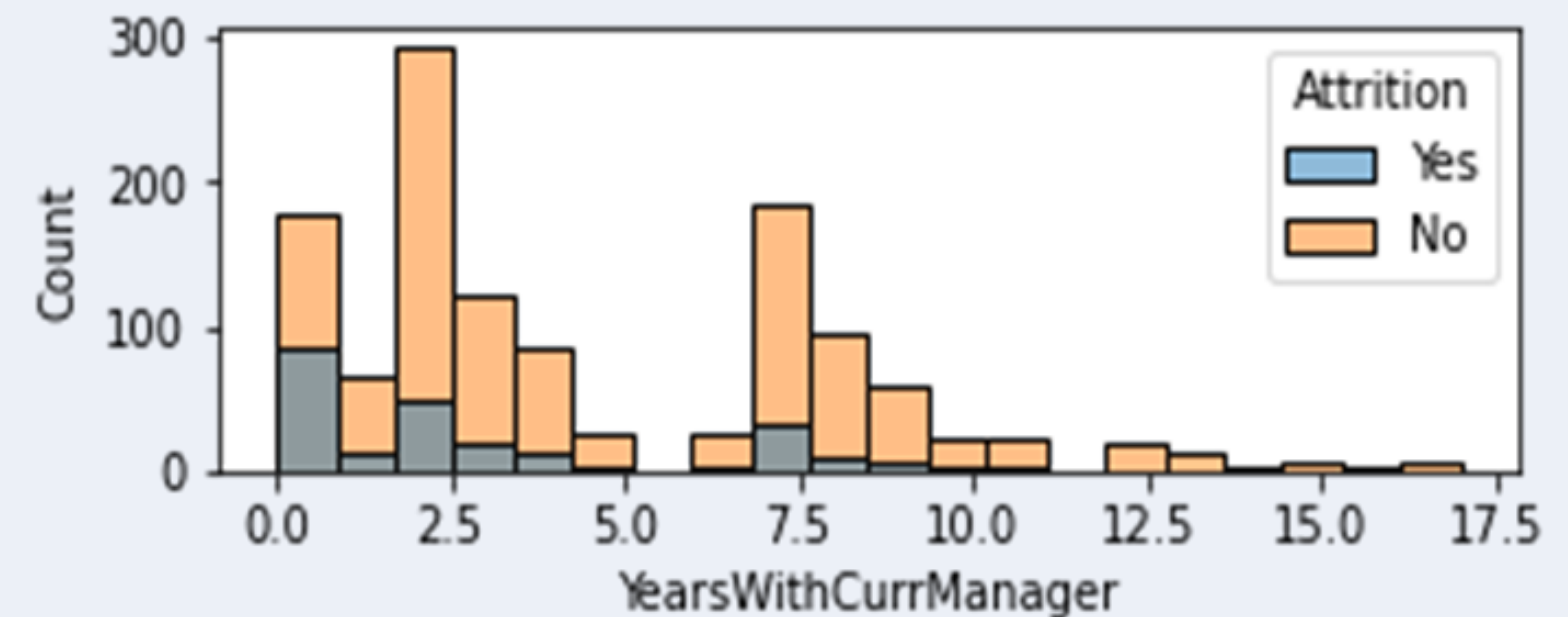

Years of experience also making an impact on employees attrition. Most of the employees made their attrition during 1 to 12 total working years of experience.

More employees made their attrition whose salary hike is less as compared with more salary hike.

Employees leave the organization in the initial years of joining the organization.

Considering Role wise attrition mostly employees from Sales Executive, Research Scientist, Laboratory Technician & Sales Representative have left the organization.
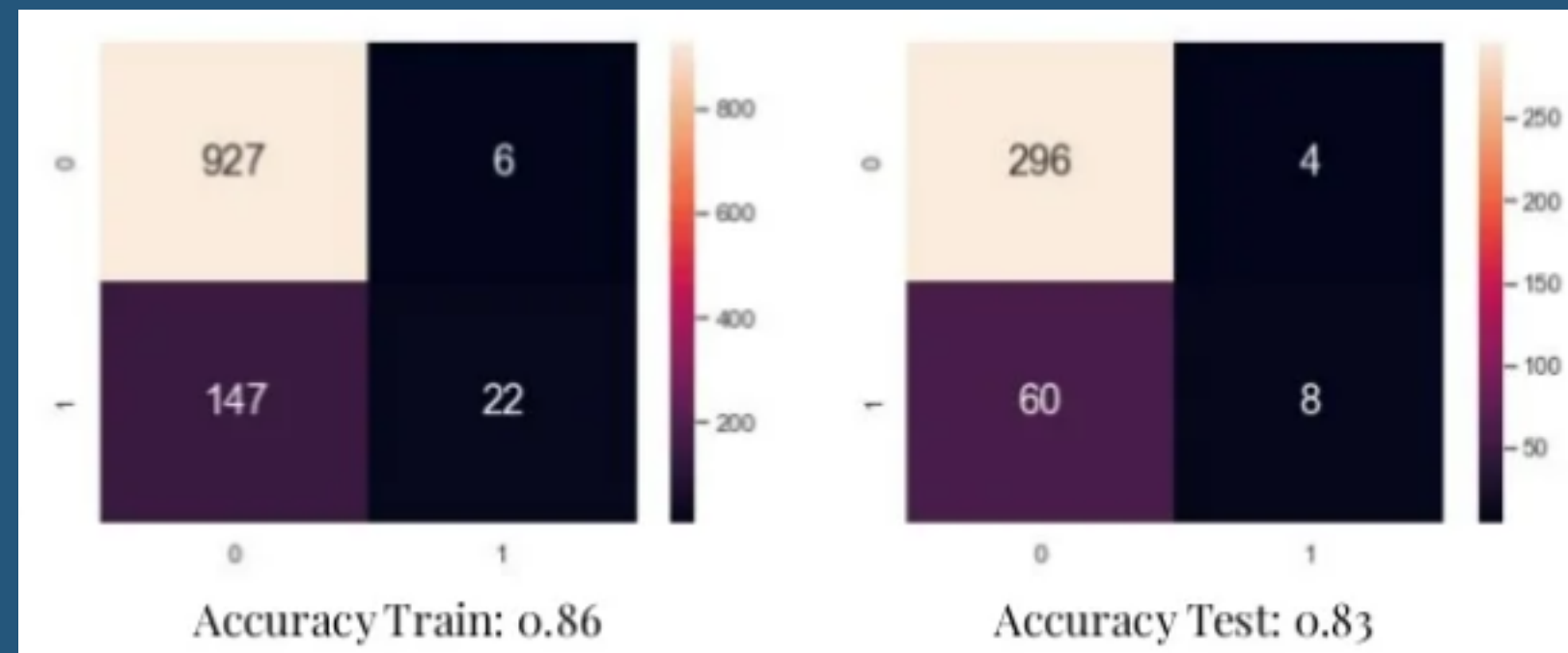
Performance rating is noticeable that employees who got the excellent rating have left the Organization. Its not good at all to lose those employees.
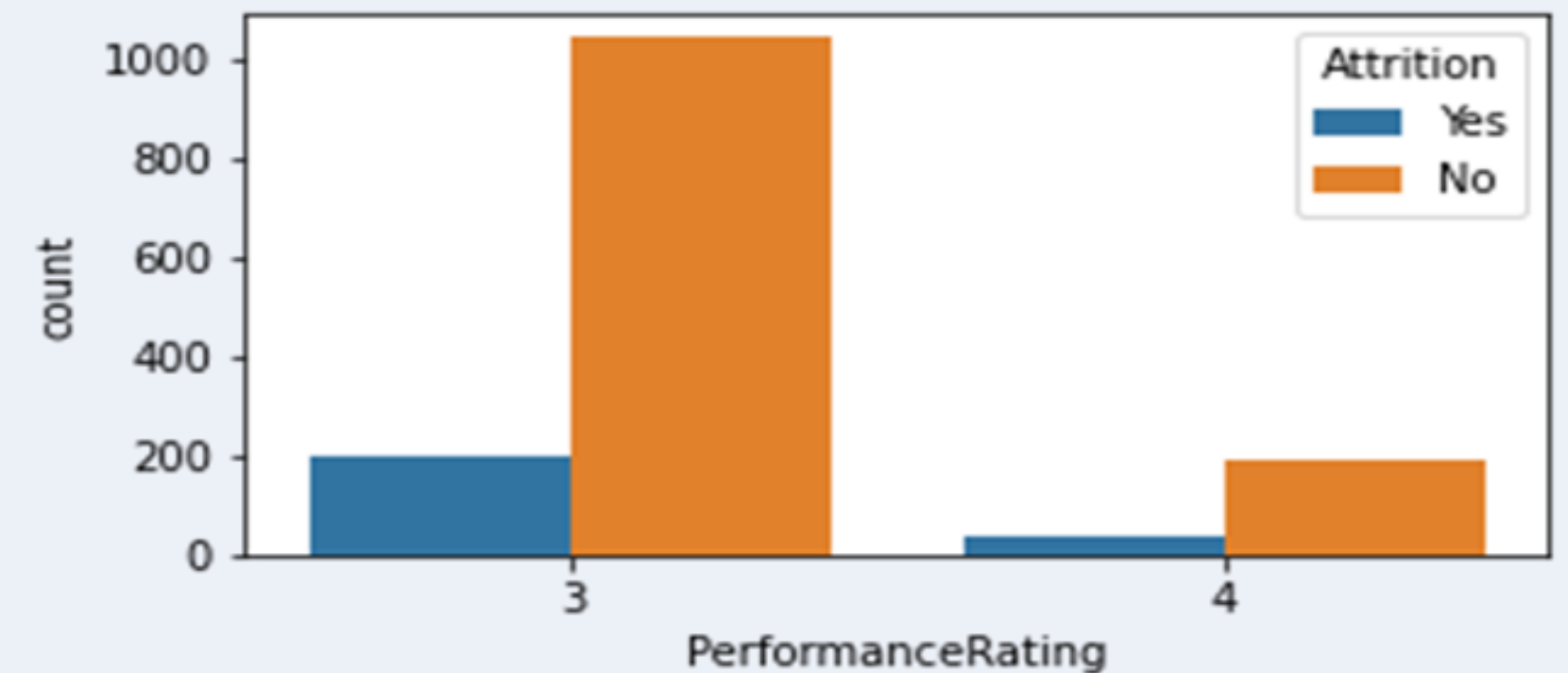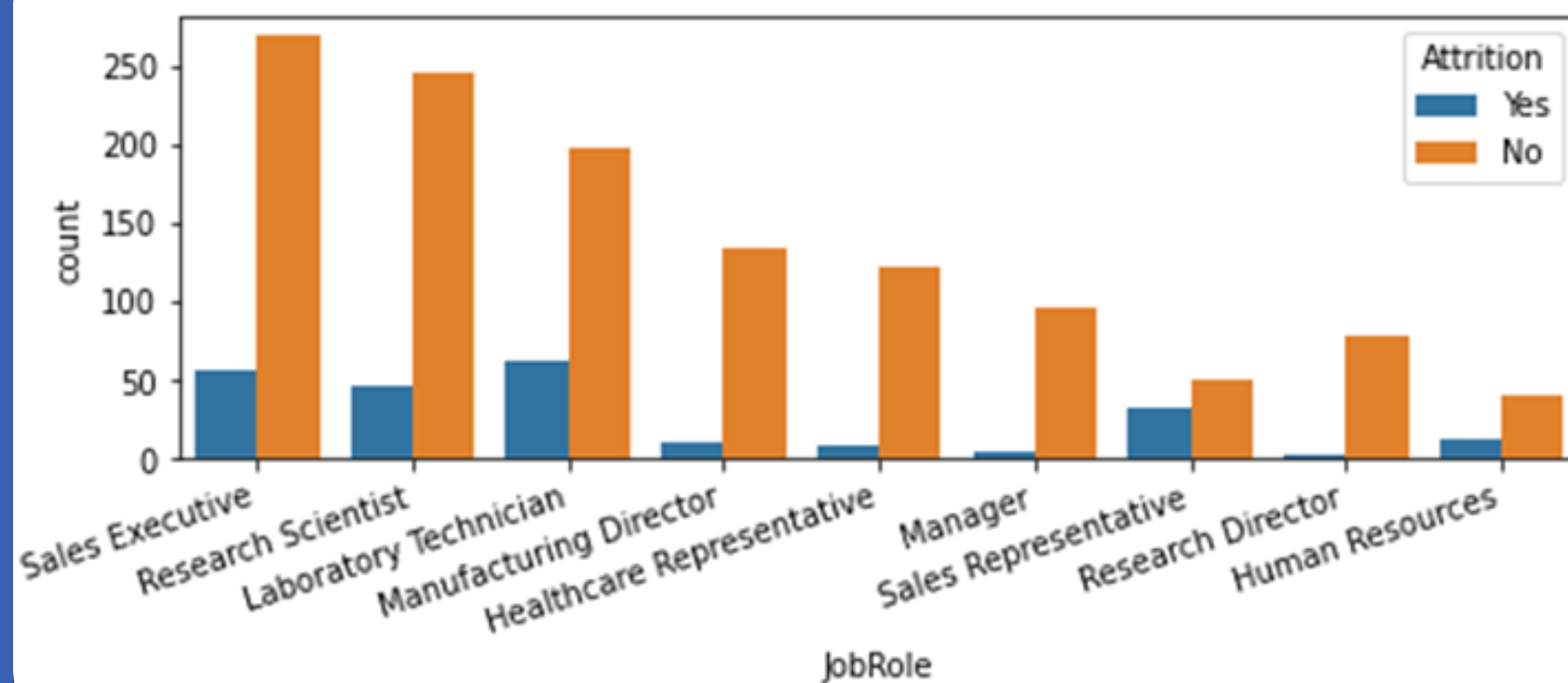
We found that our dataset is imbalanced.
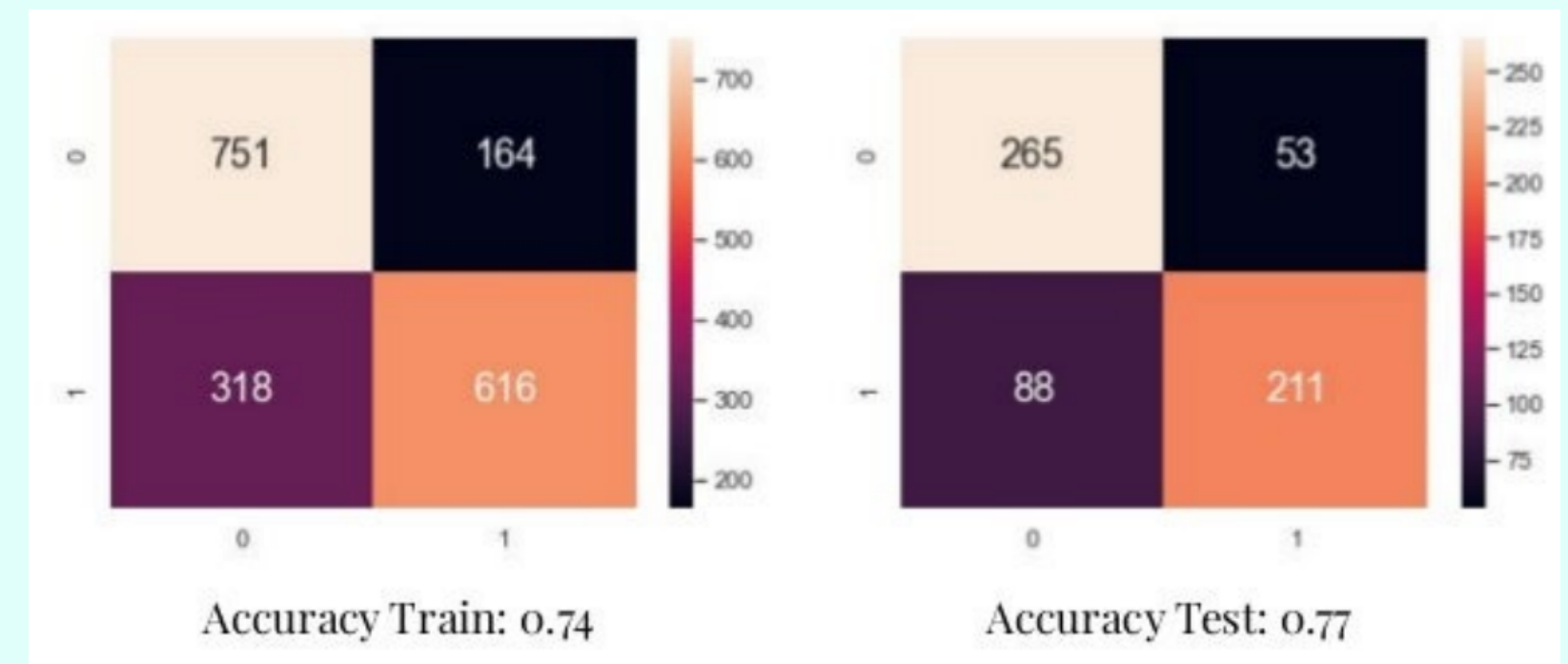The ratio of the number of people with attrition to without attrition is 1233:237
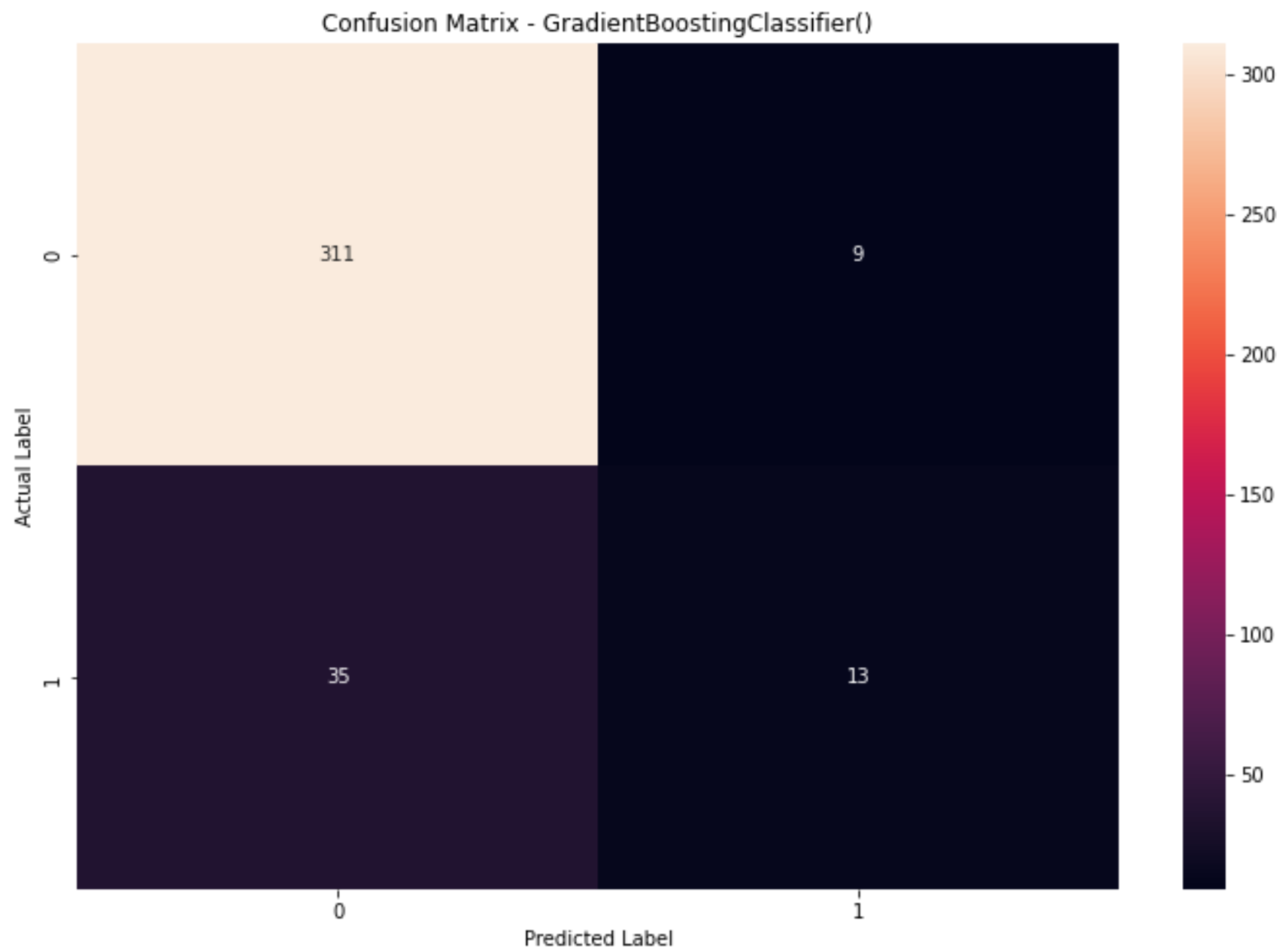The confusion matrix below is before balancing.

Decision Tree

Those who actually have attrition are classified as having no attrition.
Below is the matrix after balancing.

Accuracy Train: 0.86   Accuracy Test: 0.83

Accuracy Train: 0.74   Accuracy Test: 0.77

Accuracy Score : 88.3%
Precision Score : 61.9%
Recall Score : 27.1%
F1 Score : 37.7%

Confusion Matrix - GradientBoostingClassifier()

Accuracy Score : 88.6%
Precision Score : 66.7%
Recall Score : 25.0%
F1 Score : 36.4%
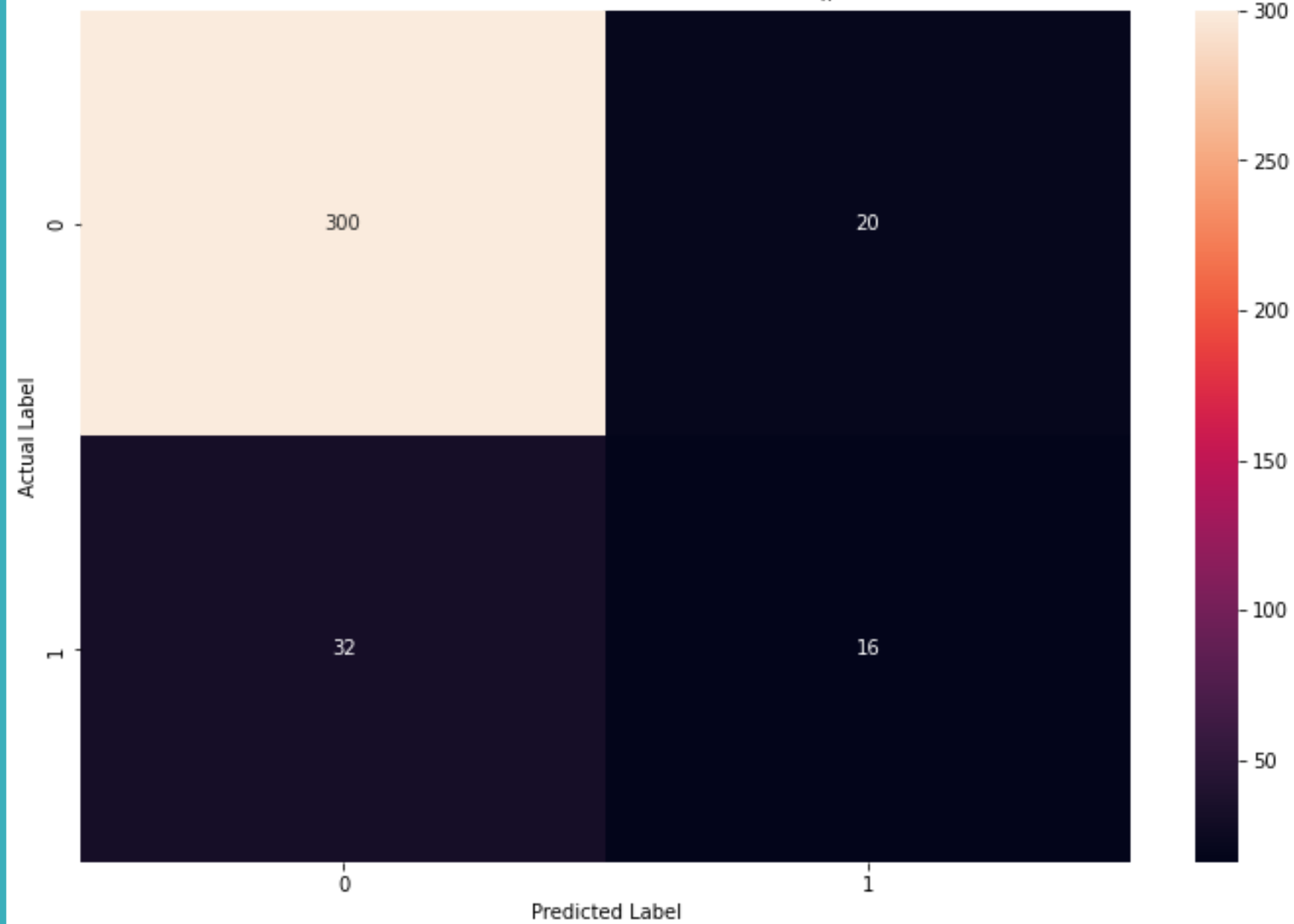
Confusion Matrix - XGBClassifier()
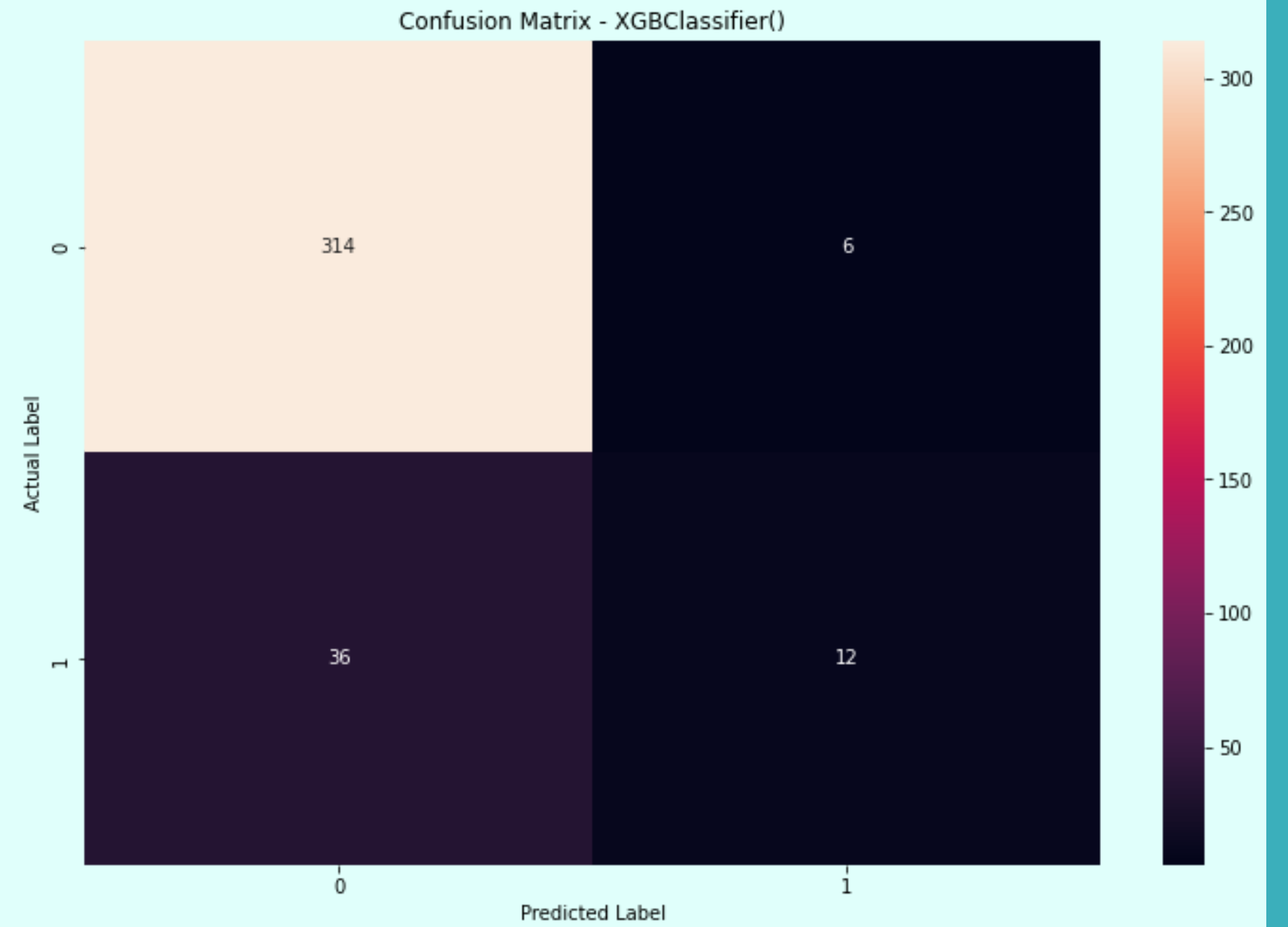
Accuracy Score : 85.9%
Precision Score : 44.4%
Recall Score : 33.3%
F1 Score : 38.1%

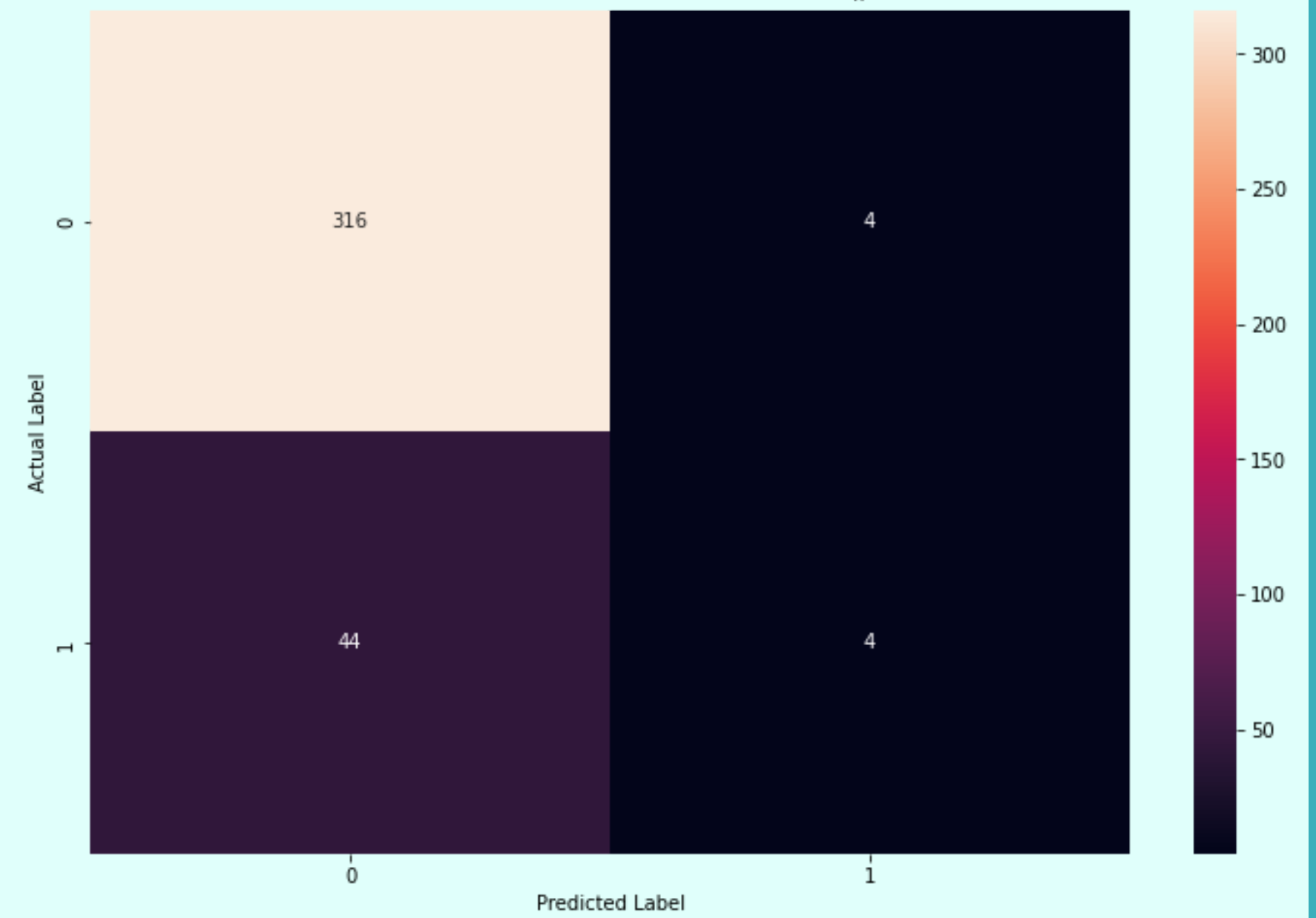Confusion Matrix - AdaBoostClassifier()

Accuracy Score : 87.2%
Precision Score : 57.1%
Recall Score : 8.3%
F1 Score : 14.5%

Confusion Matrix - RandomForestClassifier()

Conclusion

To have a low attrition rate, it is important for companies to :

- Fairly pay employees in same job level, same job involvement, same job role with almost equal monthly income and stocks.
- Offer stock options to more employees especially recruit as an incentive.
- Increase allowance for employees to work overtime, and make sure that working overtime is being paid more than those who are not.
- Companies should remember to appreciate their employees and work on the harmonic balance of their company.

THANK YOU!