

# DATA ANALYSIS ON



# BANK LOAN APPROVAL



# OUR TEAM



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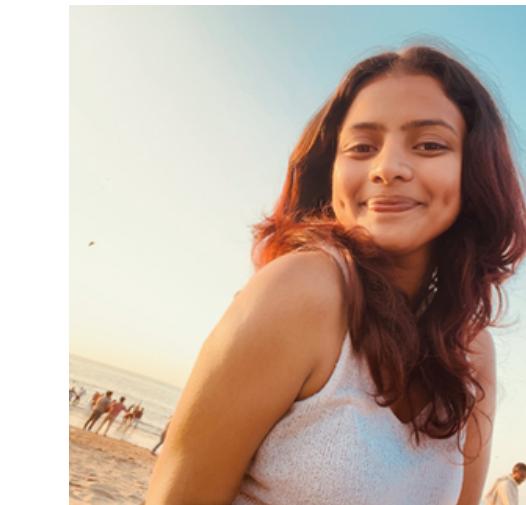
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# INTRODUCTION



## Problem

**The bank's current loan approval process may not be optimized, leading to a high rate of loan defaults or a low rate of loan approvals. This negatively impacts profitability and customer satisfaction.**

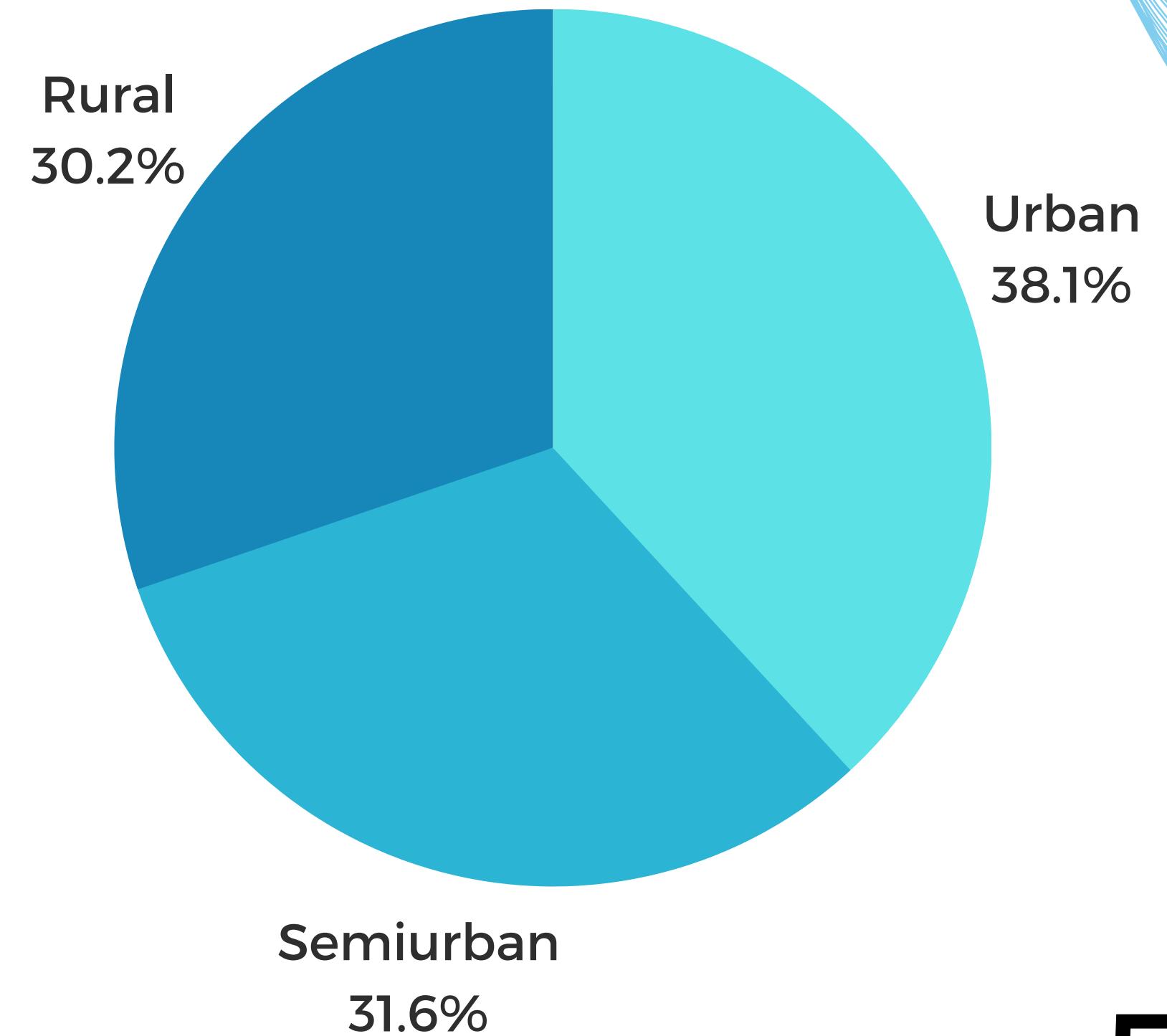


## Solution

**By leveraging historical loan data to identify the key factors that influence loan approval, the bank can implement a more data-driven loan approval process that minimises the risk of default and maximises the number of approved loans to potential borrowers.**

# ABOUT DATASET

- 38.1% of the Loan Applicants are from Urban Sector
- 31.6% of the Loan Applicants are from Semiurban Sector
- 30.2% of the Loan Applicants are from Rural Sector



Source : <https://www.kaggle.com/datasets/rishikeshkonapure/home-loan-approval>



# NEED OF OUR PROJECT

A bank approval analysis project can be a useful tool for assessing the creditworthiness of potential borrowers and determining whether to approve or deny loan applications.

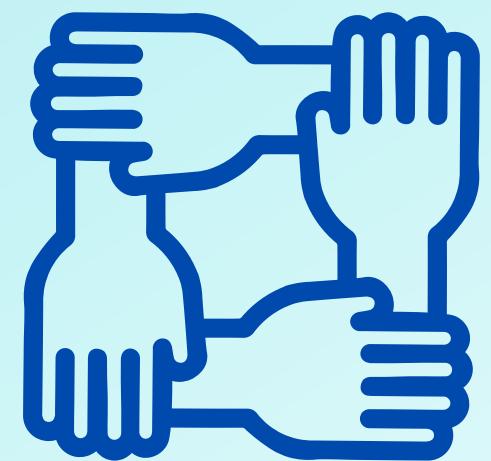
- 1. Efficiency:** Banks receive a large volume of loan applications every day, and it can be time-consuming for loan officers to review each application manually. A bank approval analysis project can automate this process and streamline the loan approval process.
- 2. Consistency:** Banks must maintain consistency in their loan approval decisions to ensure fairness and avoid discrimination. A bank approval analysis project can help banks to make objective and consistent decisions based on pre-defined criteria.



# PROJECT OBJECTIVE

We are going to optimize the loan approval process by this project where we would be analyzing historical data to identify key factors that influence loan approval and improve decision-making, by creating Interactive Dashboards and visual representatives, leading to a reduction in the risk of default and an increase in the number of approved loans to potential borrowers.





# CONTRIBUTION

DHWANI

Pivot Tables

DEEKSHA

Data Visualisation

DHRUVI

Linear Regression

HASITHA

Charts

# SOFTWARE USED:

## 1. PYTHON (version 3.10 and above)

- PySimpleGUI
- pandas
- matplotlib.pyplot
- Seaborn
- Numpy

## 2. EXCEL (version 2016 and above)



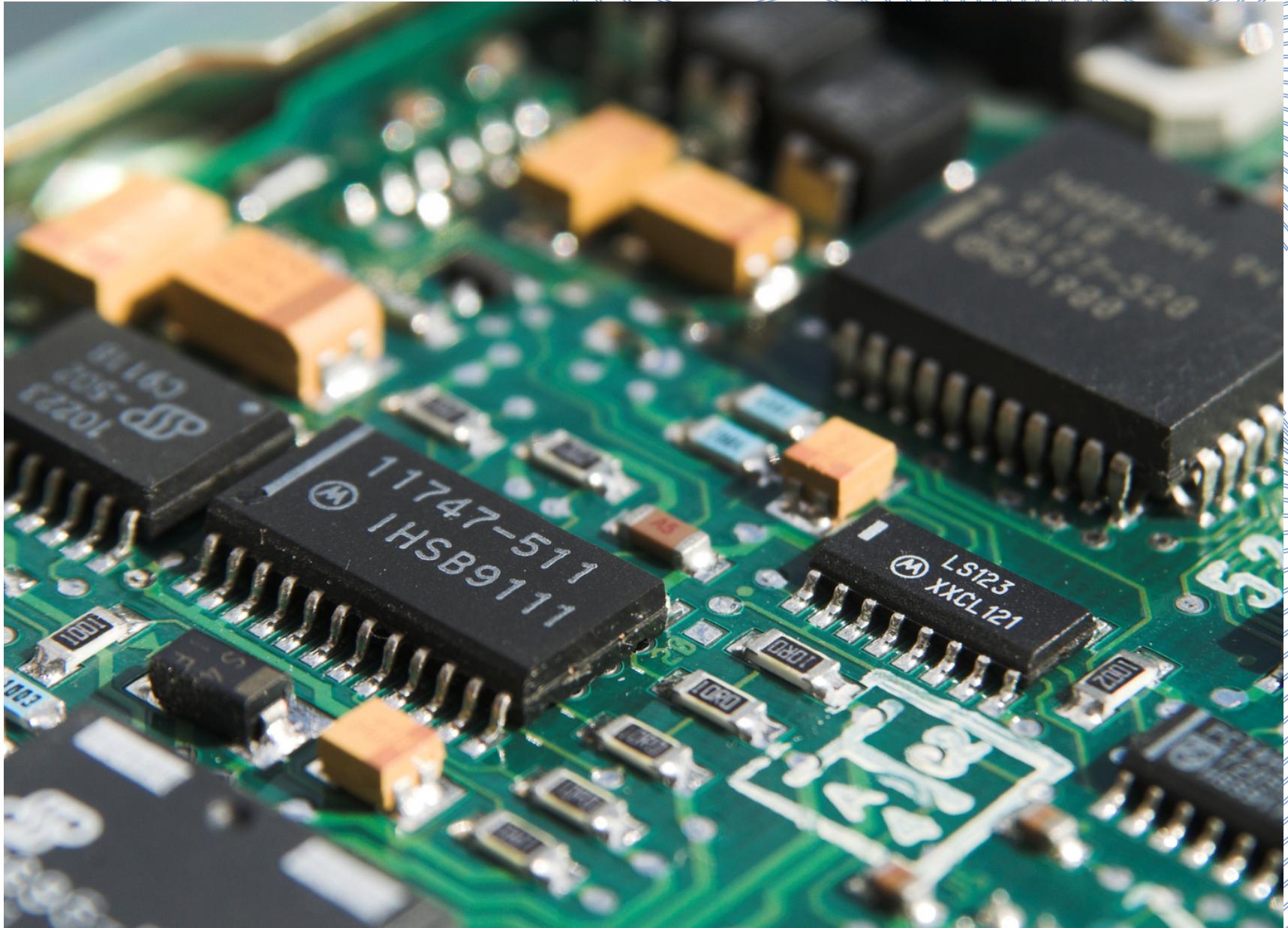
# HARDWARE USED:

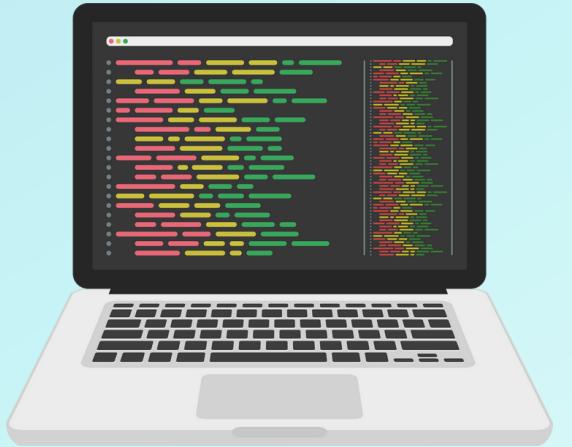
## MACBOOK PRO:-

1. Processor- i7
2. Chip- M1
3. Ram- 16gb
4. Storage- 256GB configurable to: 512GB, 1TB or 2TB
5. Memory- 8GB unified memory configurable to: 16GB or 24GB

## HP pavilion 15:-

1. OS- Windows 11 Home
2. Processor- 12th gen intel core i5
3. Ram- 16GB
4. Display- 15.6 inch (diagonal) display, FHD (1920x1080)
5. Storage- 512 GB SAD storage
6. Memory- 8GB memory
7. Battery life- charging time varies +/- 10% due to system tolerance.





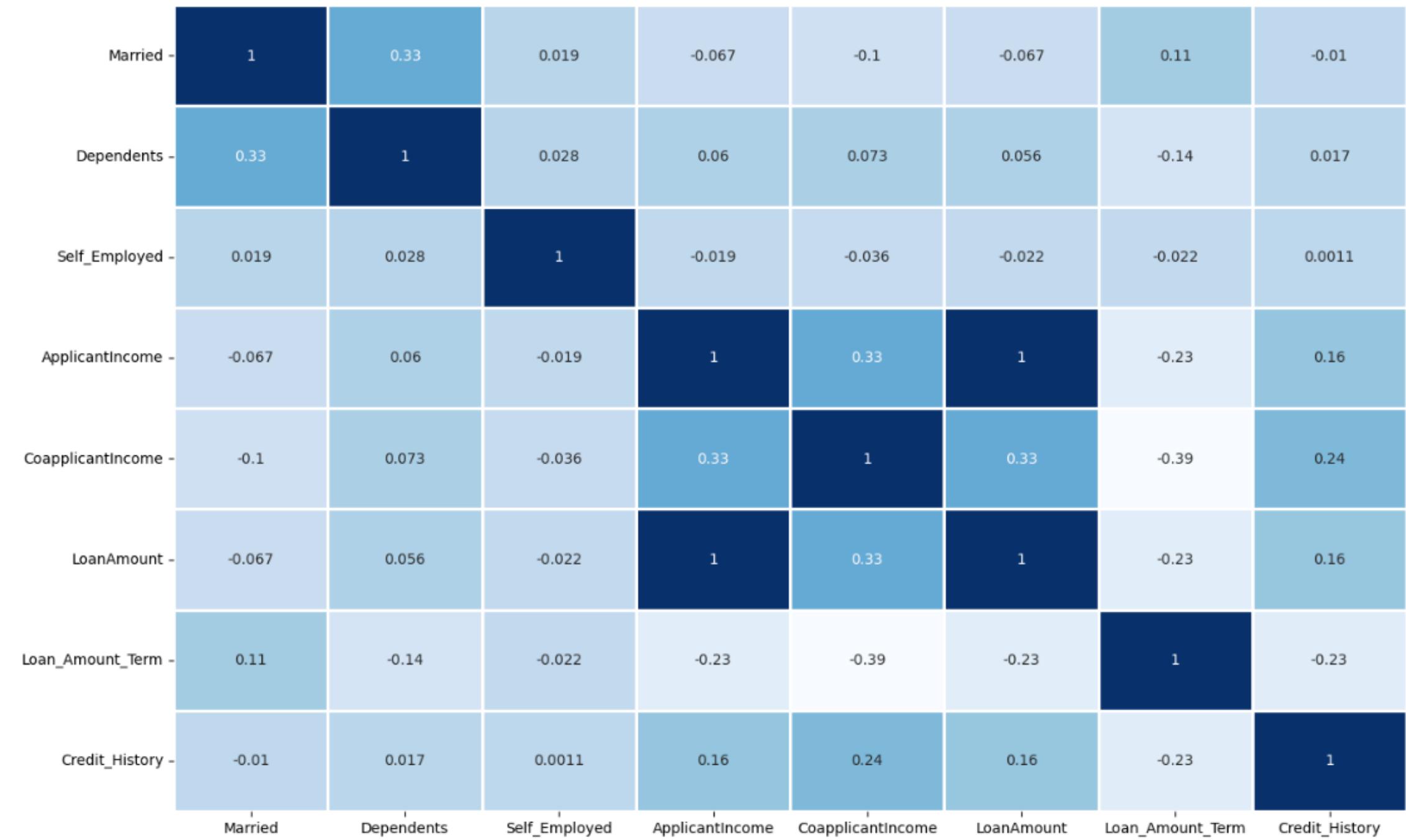
# CODE SNAPS

```
import pandas as pd  
import numpy as np  
import matplotlib.pyplot as plt  
  
[3] df=pd.read_excel('/content/python_dashboard.xlsx')  
df = df.iloc[:, :-2]  
  
import seaborn as sb  
plt.figure(figsize=(19,10))  
sb.heatmap(df.corr(), annot=True, linewidth=1, cmap='Blues')
```



# CODE SNAPSHTOS

```
<ipython-input-4-536d1cfc2680>:3: FutureWarning: The default value of numeric_only in Dataframe.corr is deprecated. In a future version, it will default to False. Select only valid columns or specify t  
    sb.heatmap(df.corr(), annot=True, linewidth=1, cmap='Blues')  
<Axes: >
```





# CODE SNAPSHTOS

```
▶ import numpy as np
import pandas as pd

df = df.dropna(subset=['ApplicantIncome', 'LoanAmount'])
df = df[(df['ApplicantIncome'].apply(lambda x: isinstance(x, (int, float)))) & (df['LoanAmount'].apply(lambda x: isinstance(x, (int, float))))]
input = df['ApplicantIncome']
output = df['LoanAmount']

def weights(input,output):
    mean_x=np.mean(input)
    mean_y=np.mean(output)
    #compute theta_1
    theta_1= (np.sum((input-mean_x)*(output-mean_y)))/(np.sum((input-mean_x)**2))

    #compute theta_0
    theta_0=mean_y-theta_1*mean_x
    print("Theta_0 and Theta_1 are {} and {} respectively".format(theta_0,theta_1))
    return [theta_0, theta_1]

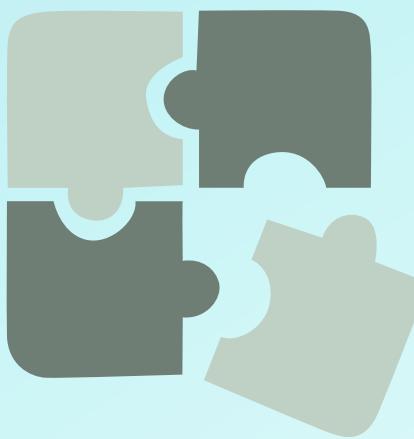
coeff = weights(np.array(input),np.array(output))
```

👤 Theta\_0 and Theta\_1 are -132904.0796551439 and 120.5684588974 respectively



# USE CASES OF APPLICATION

- 1. Fraud Detection:** Machine learning can be used to detect fraudulent loan applications and identify potential instances of loan fraud.
- 2. Customer segmentation:** Banks can use machine learning to segment customers based on their credit history, income, and other factors to determine the most suitable loan products for them.
- 3. Loan portfolio analysis:** Banks can use machine learning to analyze their loan portfolio and identify potential risks and opportunities.
- 4. Loan application processing:** Machine learning can be used to automate the loan application process, making it faster and more efficient for both customers and banks.
- 5. Credit scoring:** Machine learning can be used to develop credit scoring models that can help banks make more accurate and objective lending decisions.

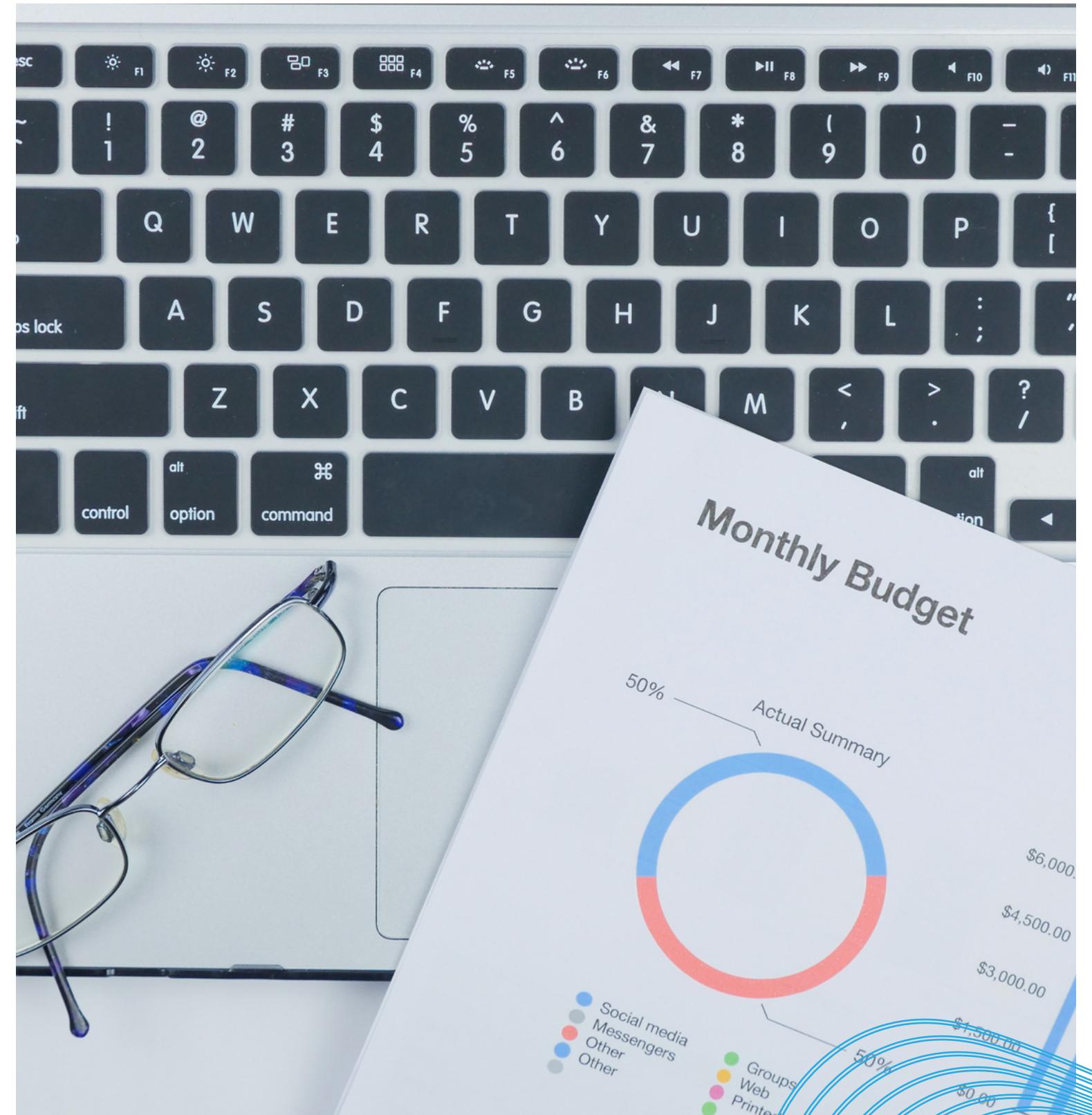


# LIMITATIONS

- DATA SECURITY : Since banking data is highly confidential, ensuring security of data is critical.
- DATA INTEGRATION : Data integration can be a challenge when dealing with multiple sources of data.
- DATA QUALITY : The quality of the data used in the dashboard can impact the accuracy of the analysis. It is important to ensure that the data is clean, accurate, and reliable.

# CONCLUSION

Overall, using interactive dashboards for bank loan approval analysis can improve decision-making, efficiency, risk management, transparency, and compliance through appealing visualisation of data. It can help banks maintain healthy loan portfolios and ensure customer satisfaction.



# REFERENCES

- [HTTPS://WWW.YOUTUBE.COM/WATCH?V=IIATJTRUZBE](https://www.youtube.com/watch?v=IIATJTRUZBE)
- [HTTPS://WWW.YOUTUBE.COM/WATCH?V=SBOA9I6D320](https://www.youtube.com/watch?v=SBOA9I6D320)
- [HTTPS://WWW.YOUTUBE.COM/WATCH?V=K74\\_FNNLIF8](https://www.youtube.com/watch?v=K74_FNNLIF8)
- [HTTPS://WWW.IRJMETS.COM/UPLOADEDFILES/PAPER/VOLUME2/ISSUE\\_5\\_MAY\\_2020/1222/1628083027.PDF](https://www.irjmets.com/uploadedfiles/paper/volume2/issue_5_may_2020/1222/1628083027.pdf)
- [HTTPS://WWW.KAGGLE.COM/DATASETS/RISHIKESHKONAPURE/HOME-LOAN-APPROVAL](https://www.kaggle.com/datasets/rishikeshkonapure/home-loan-approval)



**THANK  
YOU!**