BANK LOAN MODELLING

PROJECT REPORT

Submitted by

C.ANDAL PRIYA(92042143005)

K.RAJA LAKSHMI(920421243037)

V.NUTTRENAI(92021243033)

In partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

association with

BRAINSWIG EDUTECH PVT. LTD. CHENNAI

KAMARAJ COLLEGE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution Affiliated to Anna University, Chennai)

K. VELLAKULAM - 625 701 (Near Virudhunagar)

AUGUST 2023

KAMARAJ COLLEGE OF ENGINEERING ANDTECHNOLOGY

(An Autonomous Institution Affiliated to Anna University, Chennai)

K. VELLAKULAM - 625701 (Near Virudhunagar)

BONAFIDE CERTIFICATE

Certified that the Value-Added Course - project report "BANK LOAN MODELLING**"** is the Bonafide work of C.ANDALPRIYA(920421243005), K.RAJALAKSHMI(920421243037), V.NUTTRENAI(92021243033) who carried out the value-added course - project work under my supervision

SIGNATURE

Dr. A. MEENAKSHI, M.E., Ph.D.,

Head of the Department,

Professor,

Dept. of Computer Science and

Engineering,

Kamaraj College of Engg & Tech,

K.Vellakulam, (Near Virudhunagar)

INTERNAL GUIDE   **EXTERNAL GUIDE**

ABSTRACT

Our project report entitled to "Marketing and financial analytics: Bank loan modelling". This case is about a Thera Bank which has a growing customer base. Majority of these customers are depositors with varying size of deposits. The number of customers who are also borrowers is quite small, and the bank is interested in expanding this base rapidly to bring in more loan business and in the process, earn more through the interest on loans. In particular, the management wants to explore ways of converting its depositors to personal loan customers. A campaign that the bank ran last year for liability customers showed a healthy conversion rate of over 9% success. Thus, this project aims at creating a model that will identify the potential customers who have received loan. By this model, it will be easy for the bank to provide further loans and still increase their success rate. Analysis is carried out by using different types of data visualization tools like chart, filters, clustering, regression techniques etc…Based on the analysis recommendations and suggestion were provided. The execution of the project was a success, learnt the concepts of power bi , the results were favourable and original problem being addressed.

ACKNOWLEDGEMENT

First and foremost, we submit our gratitude to God Almighty and our Parents for their many fold blessings on us.

We extend our gratitude to our Secretary **Thiru.T.J.JEYAKUMAR, M.B.A.,** for all the facilities offered.

We express our sincere respect and thanks to our beloved Principal **Dr. S. SENTHIL, M.E., Ph.D.,** for making us march towards the glory of success.

We owe a debt of gratitude and regards to our Head the Department of Computer Science and Engineering **Dr.A.MEENAKSHI, M.E.,Ph.D.,** for her constant guidance and suggestions throughout this mini project.

We express our deep sense of gratitude and profound thanks to our Value-Added Course Project External Guide Dr.R.Dinesh Babu, **MBA.,Ph.D.,** Managing Director, Brainswig Edutech Pvt. Ltd. Chennai and our Internal guides **Mrs. S. ATHILAKSHMI, M.E., Ph.D., and Mrs.S.Hemaswathi M.E., Ph.D.,** Assistant Professor, Department of Computer Science and Engineering for their excellent advice, dynamic guidance, timely encouragement and constructive suggestions during the period of our project.

We wish to express our deeper sense of gratitude to our college faculty members and supporting technicians, family members and friends for their constant support, encouragement and co – operation.

Our sincere thanks are due each and every one who were directly or indirectly involved in the successful completion of this proje**ct.**

CONTENT:

- o Problem statement

- o Project objectives

- o Tools and techniques

- o Data analysis

- o Project Findings

- o Conclusion

PROBLEM STATEMENT:

- The bank has a greater number of depositors and a smaller number of borrowers. Thus, earning less through interest.

- Converting their depositors into borrowers by organizing a campaign with minimal budget

PROJECT OBJECTIVE:

- To create a model which will identify the potential customer to provide loan

- To increase their success rate

- To reduce the cost of campaign

DATA SETS:

The data set includes 5000 observations with fourteen variables divided into four different measurement categories.

- The binary category has five variables, including the target variable personal loan, also securities account, CD account, online banking and credit card.
- The interval category contains five variables: age, experience, income, CC avg and mortgage.
- The ordinal category includes the variables family and education.

- The last category is nominal with ID and Zip code.

DATA VISUALIZATION:

- Map
- Pie Chart
- Clustered Column Graph
- Treemap
- Card
- Scatterplot
- Donut Chart
- Key Influencers
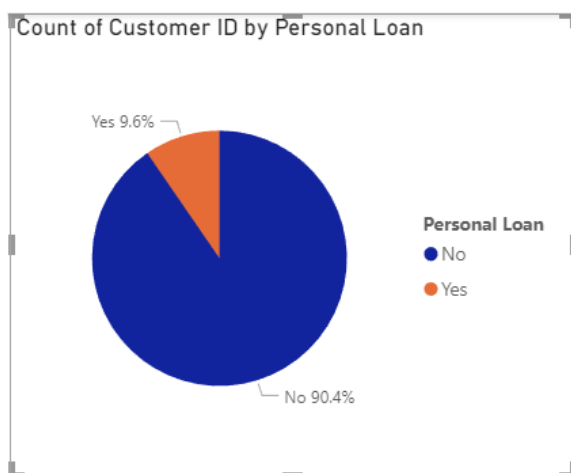- Slicer
- Bubble Chart

TECHNIQUES:

- Implemented Data Cleaning process in order to modify the dataset

Education	Mortgage	Securities Account	CD Account	Online	CreditCard	Personal Loan
1	0	1	0	0	0	0
1	0	1	0	0	0	0
1	0	0	0	0	0	0
2	0	0	0	0	0	0
2	0	0	0	0	1	0
2	155	0	0	1	0	0
2	0	0	0	1	0	0
3	0	0	0	0	1	0
2	104	0	0	1	0	0
3	0	0	0	0	0	1
3	0	0	0	0	0	0
2	0	0	0	1	0	0
3	0	1	0	0	0	0
2	0	0	0	1	0	0
1	0	1	0	0	0	0
3	0	0	0	1	1	0

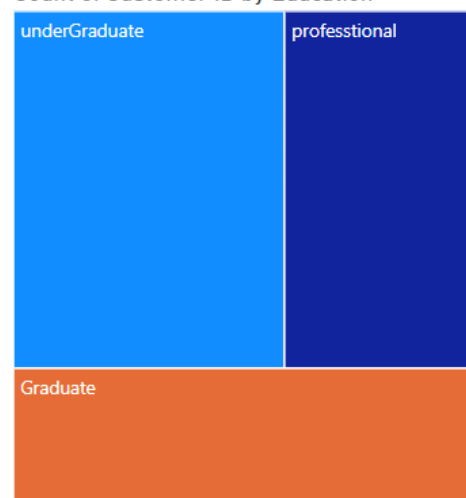| Education	Mortgage	Securities Account	CD Account	Online	CreditCard	Personal Loan
underGraduate	0	Yes	No	No	No	No
underGraduate	0	Yes	No	No	No	No
underGraduate	0	No	No	No	No	No
Graduate	0	No	No	No	No	No
Graduate	0	No	No	No	Yes	No
Graduate	155	No	No	Yes	No	No
Graduate	0	No	No	Yes	No	No
professtional	0	No	No	No	Yes	No
Graduate	104	No	No	Yes	No	No
professtional	0	No	No	No	No	Yes
professtional	0	No	No	No	No	No
Graduate	0	No	No	Yes	No	No
professtional	0	Yes	No	No	No	No
Graduate	0	No	No	Yes	No	No

- Used a variety of charts like Pie chart, Scatterplot in order to find out the features of the customers who received loans


Count of Customer ID by Personal Loan

Yes 9.6%

No 90.4%

Personal Loan
- No
- Yes

5000
Count of Customer ID

Count of Customer ID by Education and Securities Account

Securities Acc... ● No ● Yes
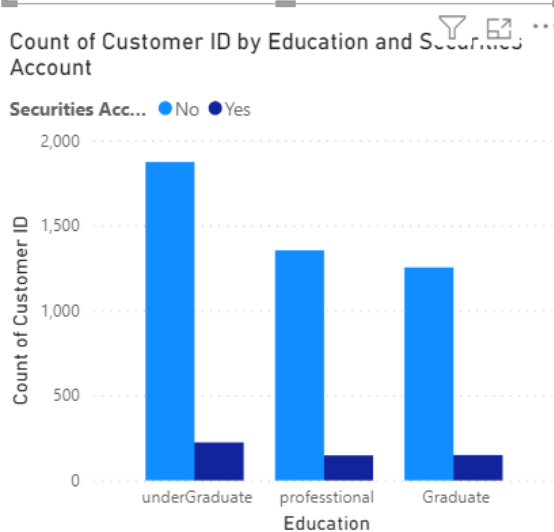
Count of Customer ID by Education

underGraduate | professtional
Graduate

- ## Used Filters and Slicers to compare different attributes

- Used Clustering and Regression techniques to understand the dependencies of one attribute over another
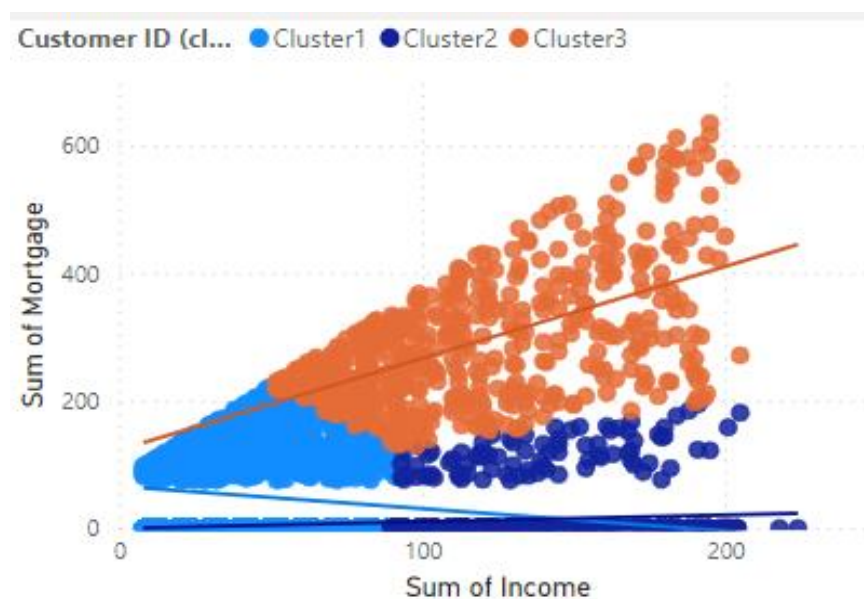
NOTE: Here we can say that in cluster 3, the sum of mortgage is depended upon the sum of income.

- Created Bins to convert continuous variables into categorical variable.

Age (bins)	Experience (bins)	Income (bins)
30	15	10
30	15	40
60	35	130
40	15	20
60	35	120
40	15	80
50	25	160
40	20	90
40	20	70
40	15	40
30	10	50
20	0	40
60	35	10
20	0	130
60	35	90
40	15	50
50	30	150

- Used AI Techniques like key influencers to study over the data set

- Used Visual from Microsoft Power Bi Visuals
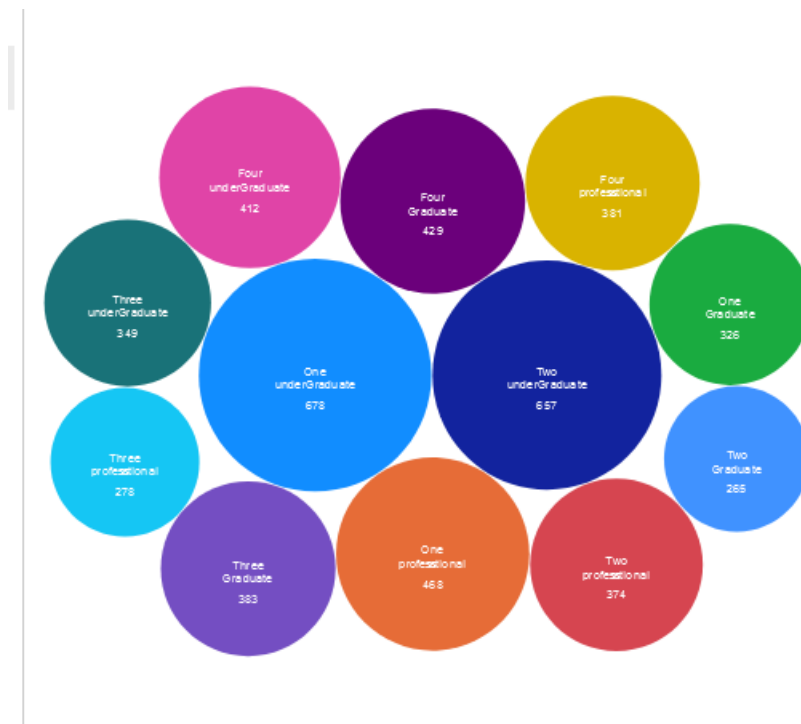
ABOUT BUBBLE CHART

1. Bubble Clustering and Grouping Capability based on Assigned Legend Field

2. Data Label Customization - Choose from different data label formats to display combinations of category, value, and % of total

3. Word Wrap & Responsive Text Options - Enables easier readability of data labels

4. Advanced Conditional Formatting - Visually highlights outliers based on different Rules

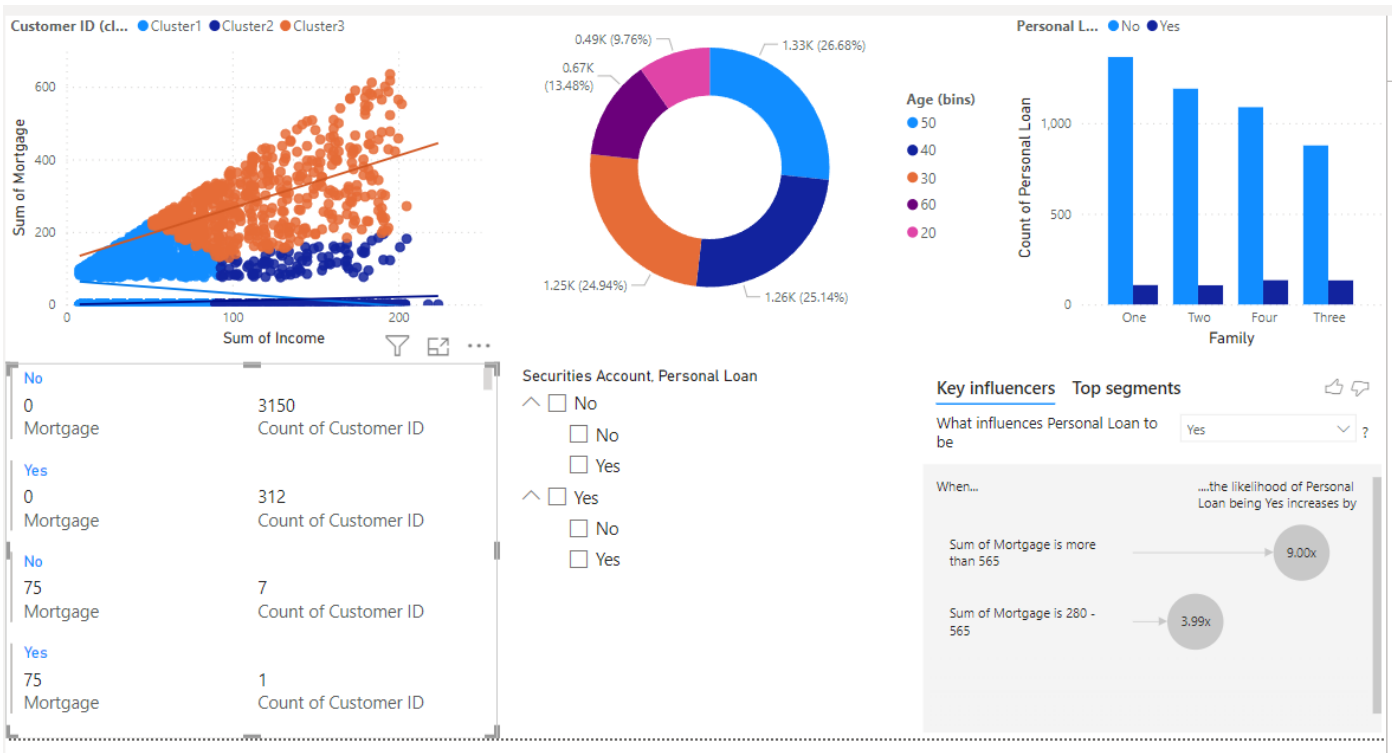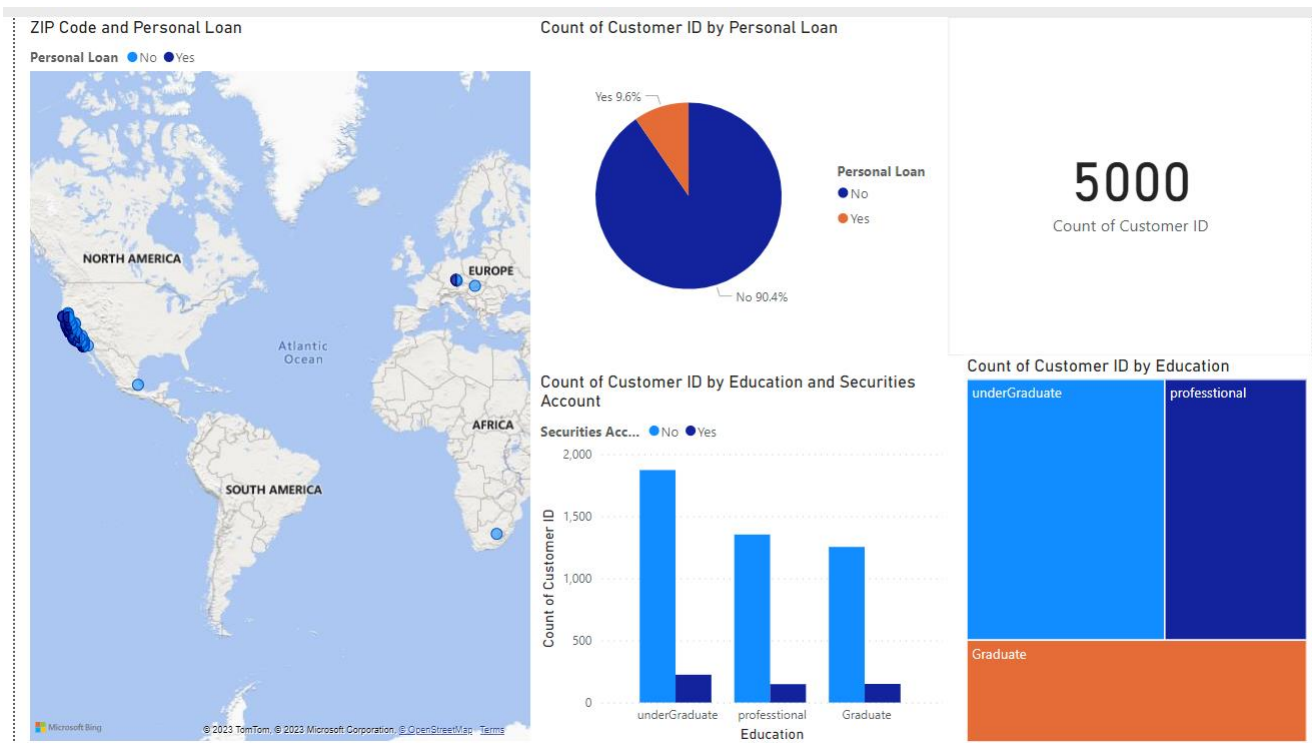5. Bubble Size Customization - Define the minimum / maximum Bubble Size
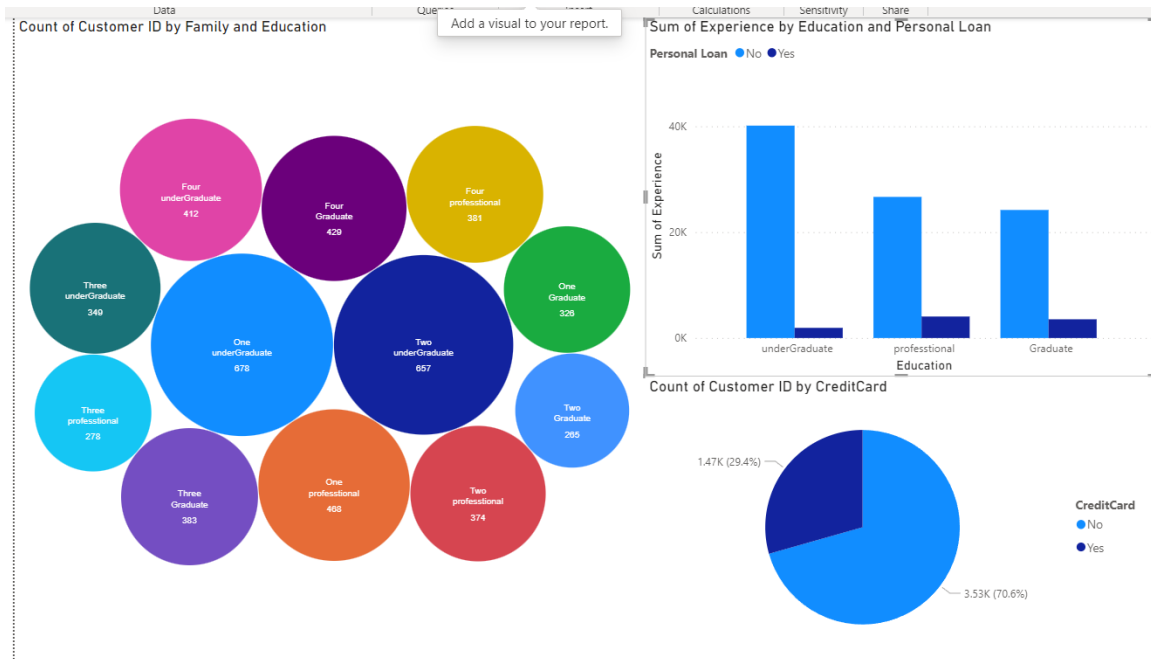
6. Drilldown Support

7. Number Formatting - enables customization of values based on various business scenarios

8. Summary Tables

DASHBOARD:

Count of Customer ID by Family and Education — Sum of Experience by Education and Personal Loan — Count of Customer ID by CreditCard

FINDINGS:

- The Total customer received loan is 480

- Mostly customer without security account and credit has received loan

- Based on Education and Experience, Professionals are provided more loan

- Customer around the age group of 50 has received more loan whereas Customer around the age group of 20 has received less loan

- Undergraduate people has shown the more usage of credit cards

- Personal loan is not provided to customer whose sum of mortgage is less than 280

RECOMMENDATION:

- It is recommended to provide loans for professional who have good experience

- It is recommended to provide loans for customer who use online mode

- It is recommended to provide loan with good mortgage value.

CONCLUSION:

Thus based on the finding and recommendation we were be able to identify the trends and patterns of the dataset. The analysis conducted using Power BI has provided valuable insights and a deeper understanding of the abstract data. The interactive visualizations and intuitive dashboards allowed for a comprehensive exploration of the information, revealing patterns, trends, and correlations that would have otherwise remained unnoticed. The use of Power BI's advanced analytics and data modeling capabilities has empowered decision-makers to make informed and data-driven choices, optimizing processes and driving organizational growth. This analysis not only sheds light on the current state of affairs but also lays the groundwork for future enhancements and optimizations, showcasing the power of data visualization and analytics in driving business success.

REFERANCE:

- https://github.com/yash-makadia/Bank-Loan-Modelling/blob/master/Bank_Loan_Modelling_Final.ipynb