

A project report on

BANK TRANSACTION ANALYSIS

Submitted in partial fulfilment for the award of the degree of

BACHELOR OF TECHNOLOGY

by

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School of Computer Science and Engineering

November, 2023

DECLARATION

I hereby declare that the report entitled “BANK TRANSACTION ANALYSIS” submitted by me, for the award of the degree of Computer Science and Engineering VIT-AP University is a record of Bonafede work carried out by me under the supervision of Maheswata (Managing director of ITT).

I further declare that the work reported in this report has not been submitted and will not be submitted, either in part or in full, for the award of any other degree or diploma in this institute or any other institute or university.

A handwritten signature in blue ink, reading "J. Pujitha" with a stylized flourish at the end.

Place: Amaravati

Date: 07-06-2024

Signature of the Candidate



INTRAINTECH
INTERNSHIP LETTER
25 Nov 2023
JONNALAGADDA PUJITHA ,
VELLORE INSTITUTE OF TECHNOLOGY AP INDIA

Dear JONNALAGADDA PUJITHA ,

I am writing to formally acknowledge the successful completion of your one-month internship with **INTRAINTECH** , Bangalore. It has been a pleasure having you as part of our team, and I would like to extend my congratulations for your dedication and enthusiasm during your time with us.

Throughout the internship period, your commitment to learning and contributing to our project, the **Bank Transaction Analysis -Banking Data Analytics** was evident. Your positive attitude, eagerness to take on tasks, and adaptability were commendable qualities that significantly benefited our team.

As you move forward in your academic and professional journey, we hope that the experiences gained during your time with us will serve as a foundation for your future endeavors.

Once again, congratulations on the successful completion of your one-month internship program. We wish you continued success in your academic and professional pursuits.

Best regards,

Maheswata Sahu

Co-Founder & MD , ITT



Chapter 1

Introduction

1.1 BANK TRANSACTION ANALYSIS

The objective of Bank Transaction Analysis is to gain insights into customer spending habits, preferences, and financial behaviors. By understanding these aspects, the aim is to offer personalized services tailored to individual needs, optimize targeted marketing efforts based on customer profiles, and ultimately enhance overall customer satisfaction.

Through a comprehensive analysis of customer behavior, businesses seek to foster stronger relationships, improve engagement, and deliver a more tailored and satisfying customer experience.

Understand the characteristics of high-spending and low-spending customer segments and their impact on overall revenue. Analyse credit card transactions to identify patterns and trends in customer spending behavior over time.

1.1.1 ADVANTAGES OF BANK TRANSACTION ANALYSIS

- **Cost Control:** Identifies areas where expenses can be reduced or optimized.
- **Budget Adherence:** Ensures spending aligns with the budget, preventing cost overruns.
- **Revenue Tracking:** Monitors income streams to understand what products or services are most profitable.
- **Expense Management:** Analyzes costs to improve profit margins.
- **Predictive Analysis:** Helps forecast future cash flows and financial needs.
- **Accurate Financial Statements:** Provides accurate data for preparing financial statements and reports.
- **Monitoring Systems:** Implements systems to detect and prevent fraudulent transactions.
- **Risk Management:** Identifies potential risks and mitigates them proactively.

1.1.2 DATA ANALYSIS & VISUALIZATION USING PYTHON

In Python, data analysis and visualization typically begin with importing necessary libraries such as Pandas, NumPy, and Matplotlib or Seaborn. The first step involves loading the dataset into a Pandas DataFrame, where data can be inspected and cleaned. Pandas provides powerful tools for filtering, sorting, and handling missing data. Once the data is prepared, statistical analysis can be performed to gain insights into the dataset's characteristics. Descriptive statistics, correlation analysis, and data profiling are common techniques used at this stage

For visualization, Matplotlib and Seaborn are popular libraries for creating static plots, while tools like Plotly offer interactive visualizations. Visualizations can range from simple bar charts and scatter plots to more complex heatmaps and 3D plots, depending on the nature of the data and the insights sought. Seaborn, built on top of Matplotlib, streamlines the creation of aesthetically pleasing statistical graphics. Finally, the results of the analysis can be communicated effectively through well-designed visualizations and reports, ensuring that complex information. Overall, Python provides a versatile and powerful ecosystem for data analysis and visualization, making it a popular choice for professionals in various fields.

VISUALIZATIONS USED IN PYTHON

Mean of Transactions by Card and Expense Type

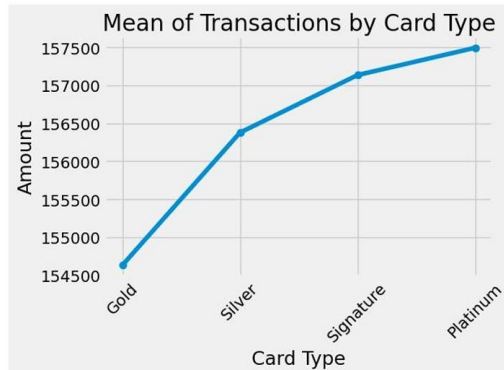


fig 1

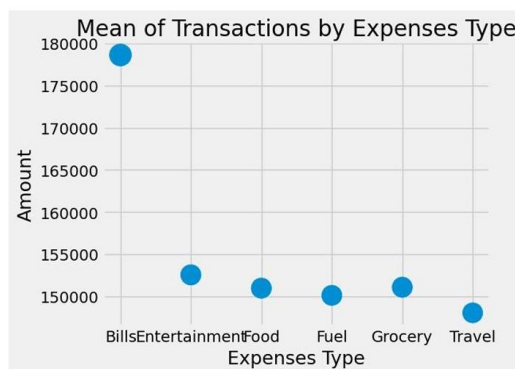


fig 2

Gender Spending Comparison

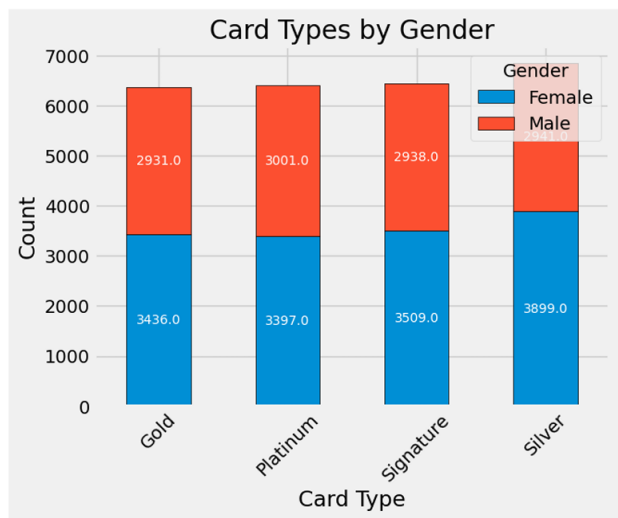


fig 3

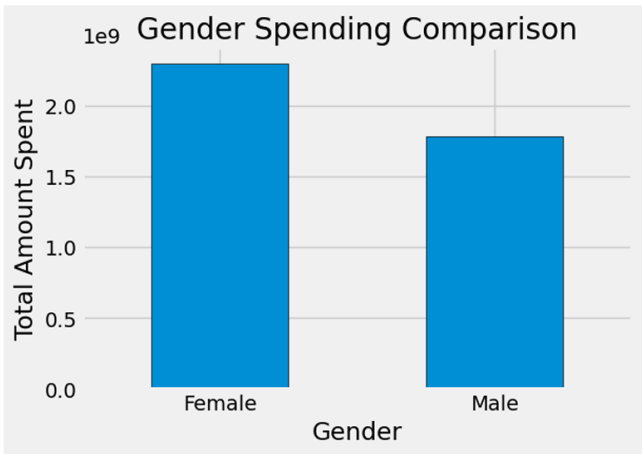


fig 4

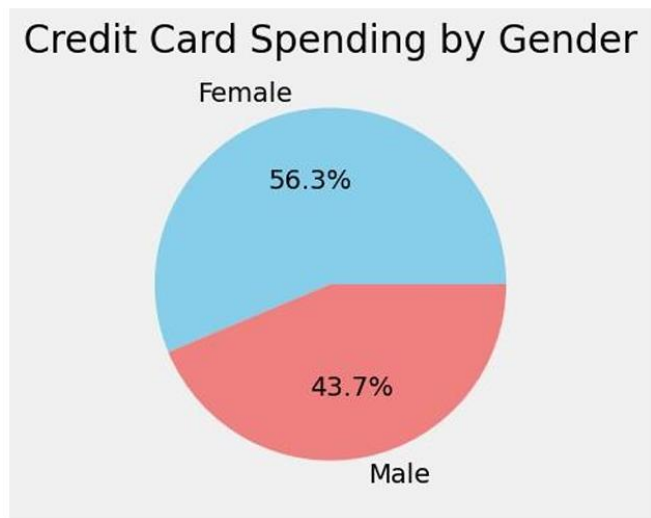


fig 5

Distribution of Card Types

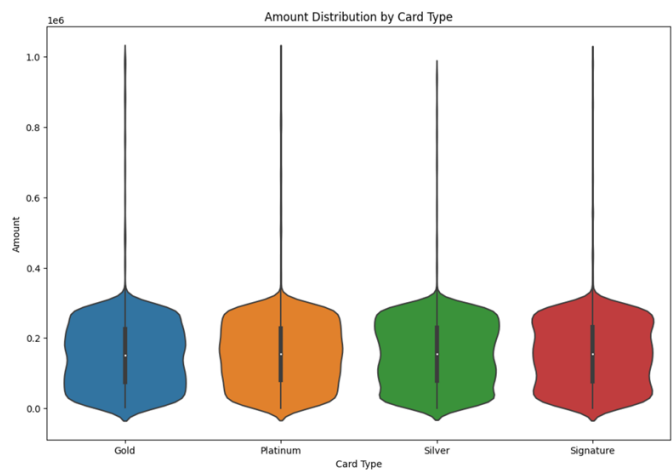


fig 6

Card Type Distribution

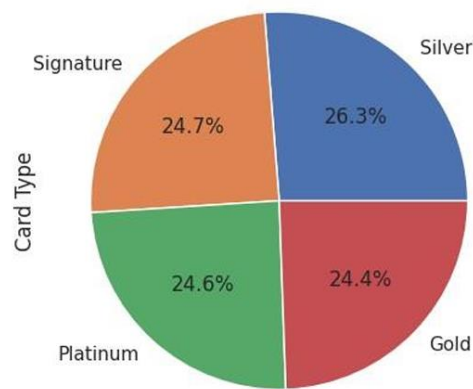


fig 7

Expense Type Breakdown - Proportion and Distribution

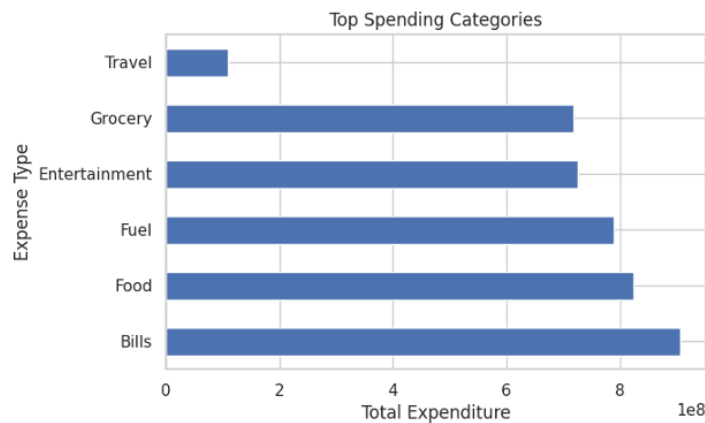


fig 8

Average Transaction Amount by Expense Type Yearly and Monthly Total Amount Spent Over Time

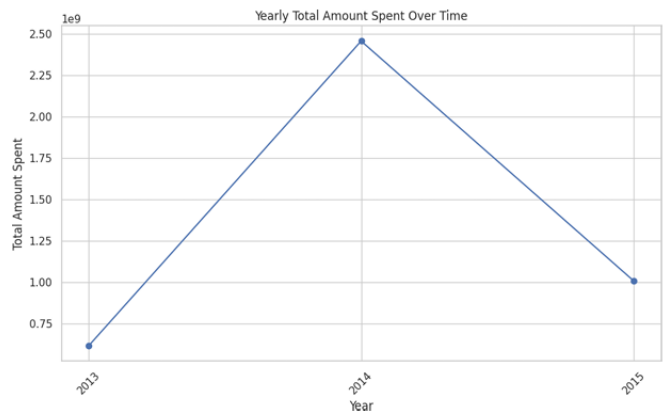


fig 9

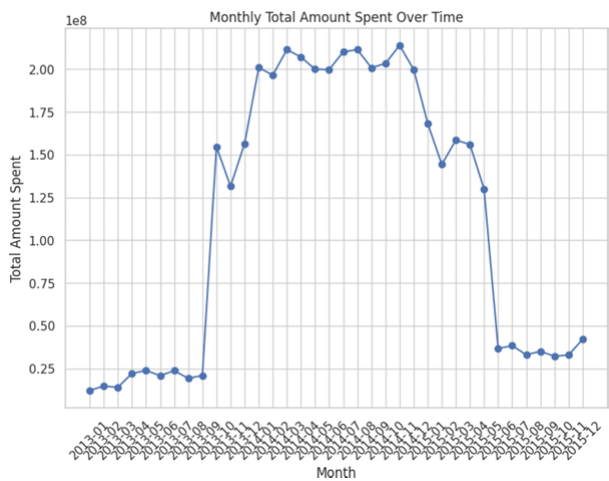


fig 10

Stacked Area Chart of Expense Types over Time

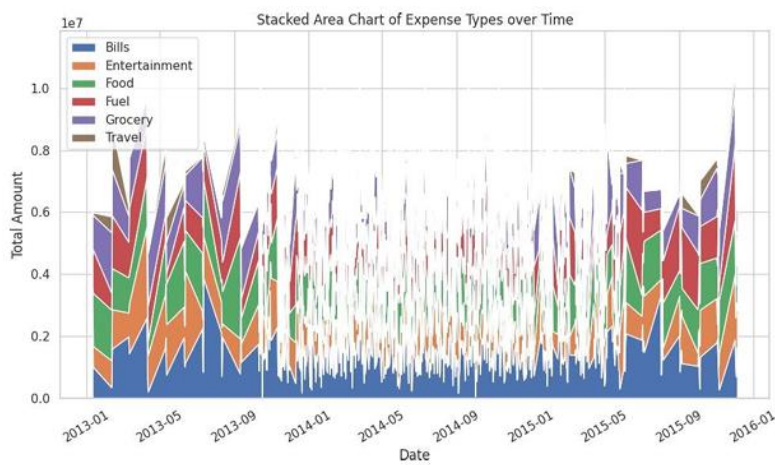


fig 11

Correlation Matrix

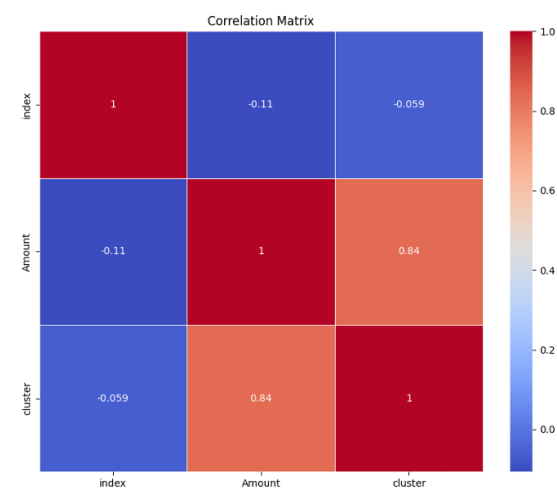


fig 12

City-wise Expenditures

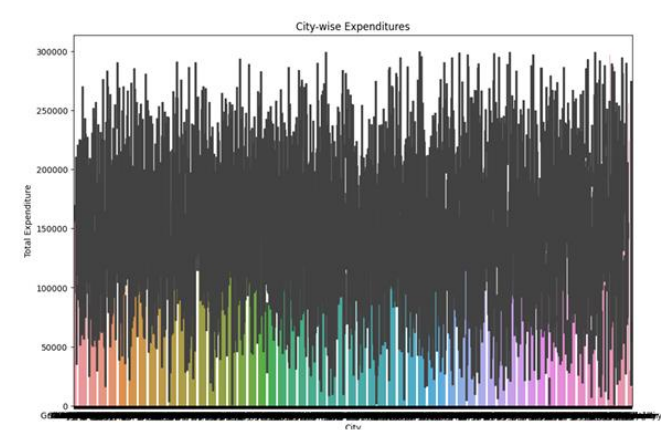


fig 13

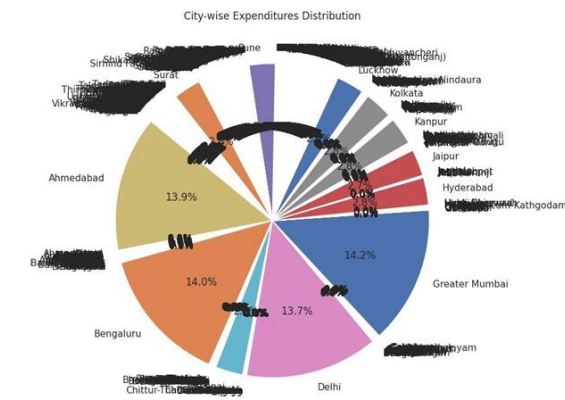


fig 14

City-wise Expenditures for Selected Cities Mean of Highest and Lowest cities in transactions



fig 15

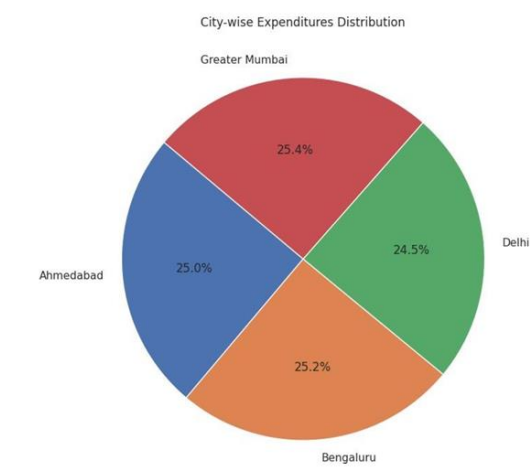


fig 16

Anomaly Detection: Unusual Spending Pattern

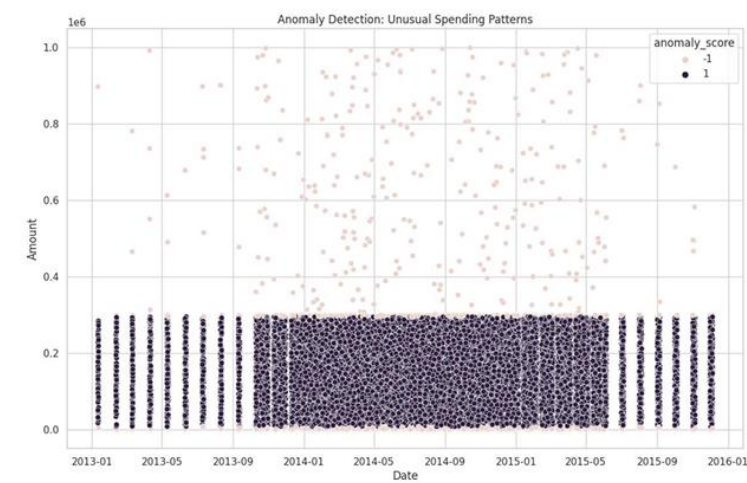


fig 17

1.1.3 DATA ANALYSIS & VISUALIZATION USING POWER-BI

Power BI is a Microsoft tool that facilitates efficient data analysis and visualization. It allows users to import and shape data from various sources, creating dynamic and interactive visualizations such as charts and graphs. With real-time updates and sharing capabilities, Power BI promotes collaboration and informed decision-making within organizations. Its user-friendly interface supports easy manipulation of data, and the tool's ability to handle diverse data sets ensures a comprehensive analysis. Power BI's features, including natural language queries, empower users to derive actionable insights, making it a valuable asset for businesses seeking to harness the power of their data for strategic decision-making.

ESTABLISHING RELATIONSHIP BETWEEN TWO TABLES DATE TABLE AND SALES TABLE:

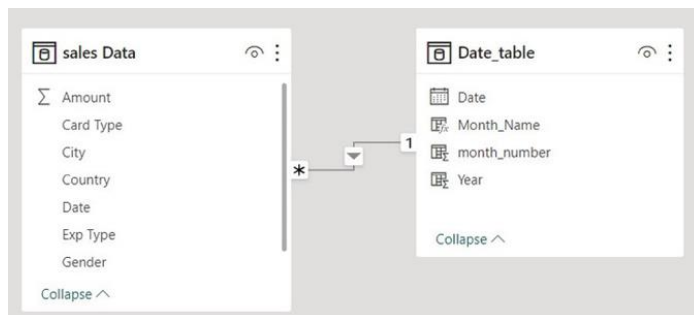
Using DAX Expressions we have created new columns for better and accurate data analysis:

```
Month_Name = FORMAT(Date_table[Date], "mmm")
```

```
month_number = MONTH(Date_table[Date])
```

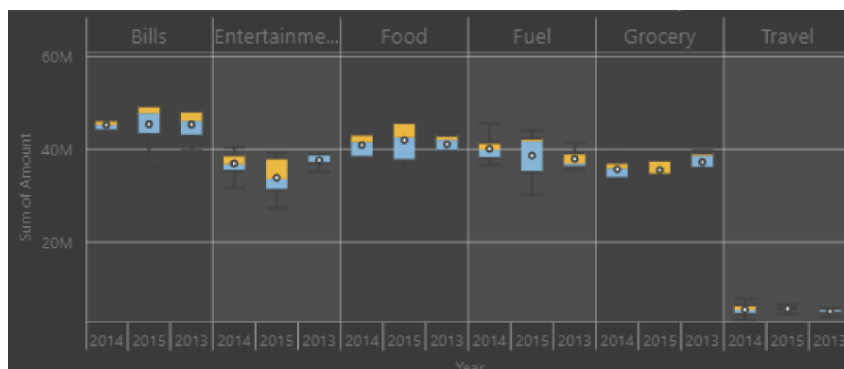
```
Year YEAR(Date_table[Date])
```

```
Date_table CALENDARAUTO()
```

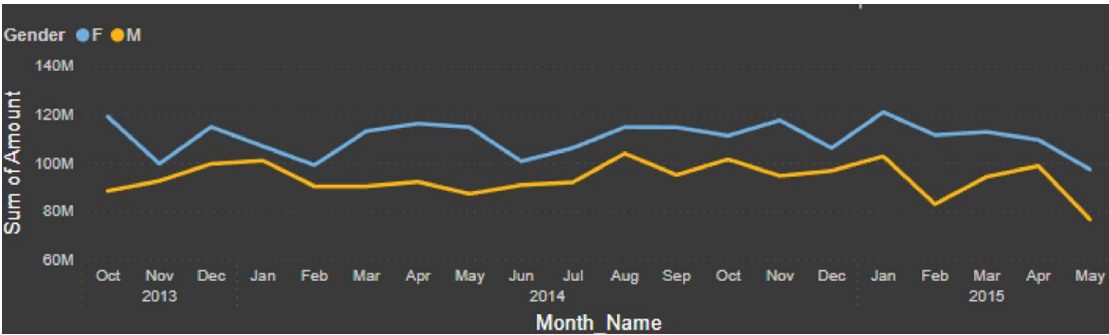


VISUALIZATIONS USED IN POWER-BI

Box Plot



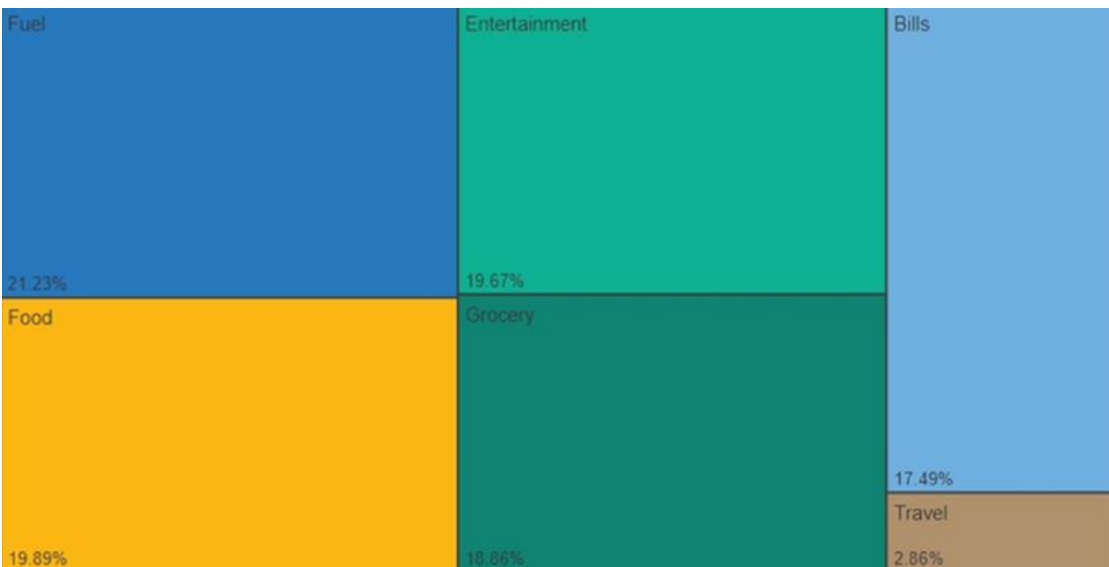
Line Chart



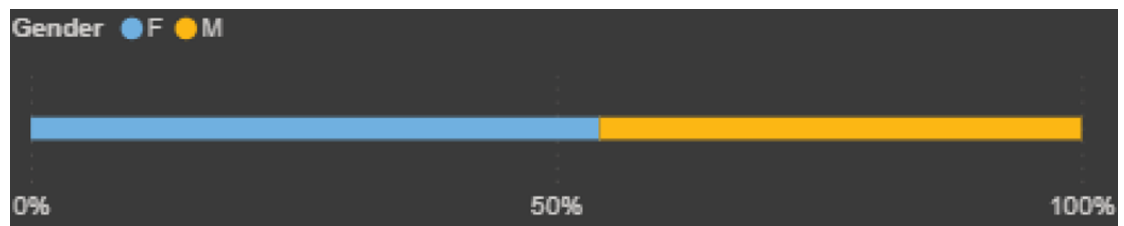
Sun Burst



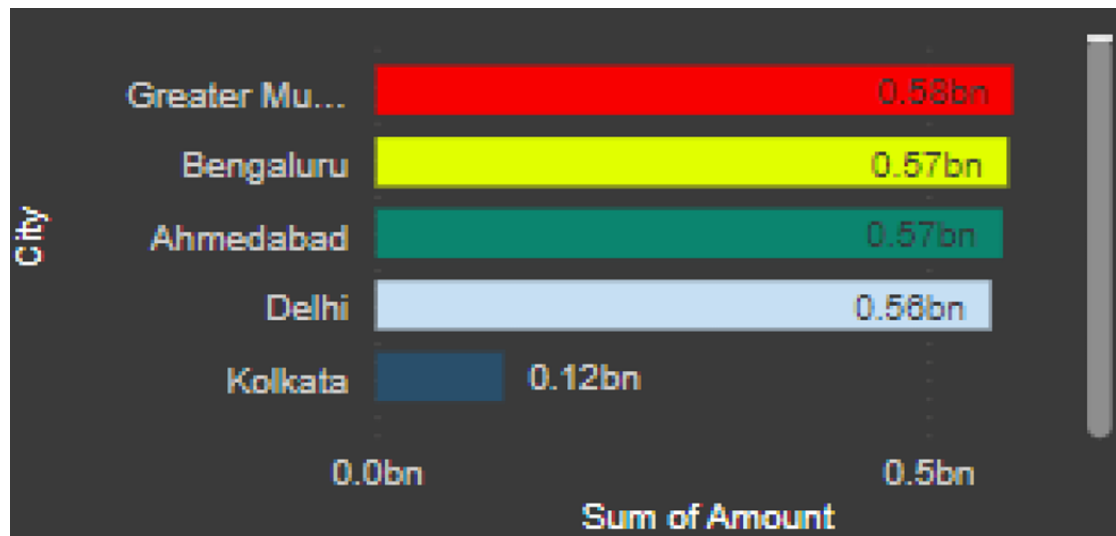
Tree Map



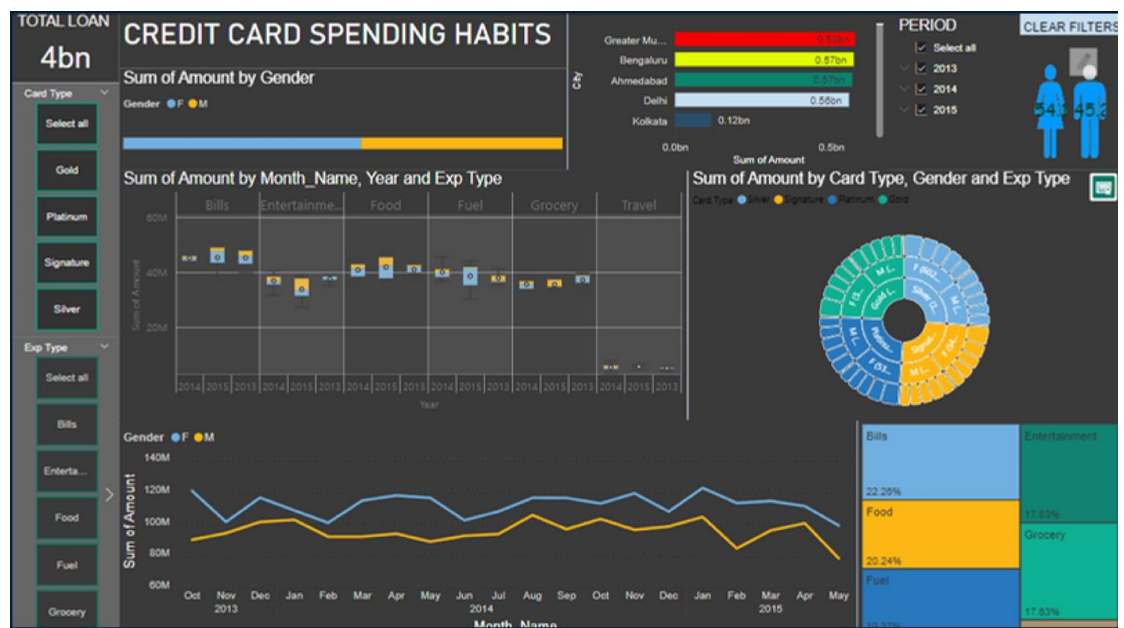
100% Stacked Bar Chart



Stacked Bar Chart



DASHBOARD



Conclusion & Future Work

CONCLUSION

In completing my internship program at Intraitech, I undertook a comprehensive project on bank transaction analysis, employing both Python and Power BI for data visualization. The primary goal was to analyze transaction data to uncover insights and patterns that could inform better financial decision-making for individuals and businesses. The project encompassed data cleaning, exploratory data analysis, visualization, and interpretation of results.

Using Python libraries such as Matplotlib and Seaborn, and Power BI, I successfully created a range of visualizations that made complex data more comprehensible. These visualizations included transaction trends over time, category-wise spending analysis, and cash flow summaries.

The analysis revealed significant spending patterns and seasonal trends in transactions. For instance, it was observed that certain categories

FUTURE WORK

Extended Analysis with More Data:

Given more time, expanding the dataset to include more historical data and additional financial metrics would enable more robust trend analysis and predictive modeling.

Advanced Analytics and Machine Learning:

Integrating advanced analytics and machine learning techniques could enhance the project's ability to predict future transactions and detect fraudulent activities with higher accuracy. For example, implementing clustering algorithms to identify customer segments or using anomaly detection algorithms to improve fraud detection.

Real-time Data Processing:

Developing capabilities for real-time data processing and visualization would provide more immediate insights, enabling users to react quickly to financial changes and potential issues.

REFERENCES

<https://intraintech.com/course/python-programming/?source=lessons> < For Classes>

<https://www.kaggle.com/datasets/apoorvwatsky/bank-transaction-data> <For Data Set>