HBFC BANK – PERSONAL LOAN

Business Report

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Introduction:

HBFC Bank is experiencing steady growth in its customer base, primarily consisting of depositors and term deposit account holders. However, the number of customers with loan accounts remains relatively small. To accelerate business growth and revenue through loan interest, the bank aims to convert its existing depositors into personal loan customers while retaining them as depositors.

Data Description:

The dataset provided contains information on 5000 customers, encompassing various aspects, including:

- Demographic information (e.g., age, income)
- Customer-bank relationship details (e.g., mortgage, securities account)
- Response to the last personal loan campaign (Personal Loan)

Objective:

The main aim of this report is to construct a predictive model capable of identifying prospective customers who are more likely to apply for personal loans. To accomplish this, the initial step involves a comprehensive analysis of historical customer data to uncover actionable insights.

1. Percentage of Customers Availing Personal Loans in the Data:

No. of people who availed a personal loan	480
% of people who availed a personal loan	9.6%

Description:

        In our data analysis, we utilized the **COUNTIF function** to determine the percentage of the bank's customers who have availed Personal Loans. The **outcome revealed that 9.6% of the bank's customer base have indeed availed Personal Loans**. This finding offers valuable insights into the bank's product adoption and customer behavior, which can inform future strategies and decisions.

2. Summary Statistics for Numeric Variables: Age, Experience, Income, Family Members, CCAvg, and Mortgage:

Ans. 2

Data Types	Age	Experience	Income	Family members	CCAvg	Mortgage
Min	23	0	8	1	0	0
Max	67	43	224	4	10	635
Median	45	20	64	2	1.5	0
Average/Mean	45.3384	20.1348	73.7742	2.3976	1.937938	56.4988

Description:

        The table presents key statistics for several numeric variables in the dataset, offering insights into customer demographics and financial behaviors. Notably, the **age distribution spans from 23 to 67, with a median of around 45**, showcasing a diverse customer base. However, the presence of zero and negative experience values requires investigation. **Income varies widely, ranging from $8 to $224, with a median of approximately $64**, suggesting a broad income spectrum among customers.

        Most **customers have smaller families**, but **some have larger households**. **Credit card spending varies from 0 to 10, with a median of 1.5**, illustrating diverse spending habits. Intriguingly, a **substantial portion of customers has no mortgages**. These findings can guide marketing strategies and product offerings, but attention to data quality, especially regarding experience values, is crucial.

3. Creating Categorical Variable for Experience and Bar Graph:

Description:

        I created a new categorical variable for **'Experience'** by dividing it into **four categories: '0 to 10 years,' '11 to 20 years,' '21 to 30 years,' and '30+ years'** using Excel's **IF conditions(=IF(C1<=10,"0-10",IF(C1<=20,"11-20",IF(C1<=30,"21-30","30+"))))**. Then, I plotted a **bar graph to visualize the distribution of experience levels among the**

bank's customers. The graph effectively illustrates **how many customers fall into each of these experience categories, providing a clear view of the distribution**.

This information can be valuable for understanding the customer base and tailoring services or marketing strategies to different experience groups.

Exp. Category	Count of Exp. Category
0-10	1288
11-20	1253
21-30	1301
30+	1158

The bar graph illustrates the distribution of customers across four experience categories: "0-10," "11-20," "21-30," and "30+." It reveals that **the largest number of customers fall into the "21-30" experience category**, with **approximately 1301 customers**. The **"0-10" and "11-20"** categories closely follow with **1288 and 1253 customers**, respectively. The **"30+"** category has a somewhat smaller representation, with around **1158 customers**. This bar graph effectively visualizes the distribution of customer experience levels, providing a clear and easy-to-understand depiction of the data.

4. Scatter Plot: Age vs. Experience:
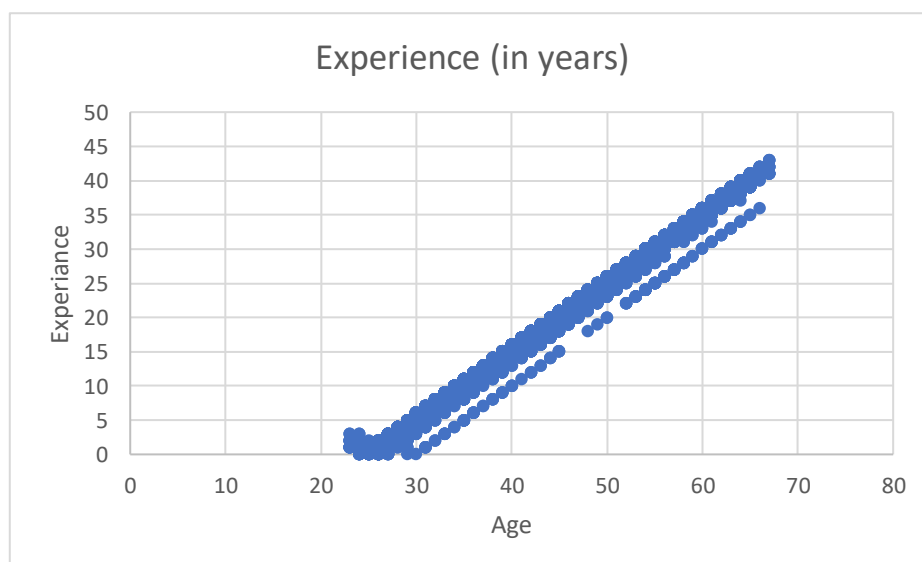
Description: The scatter plot highlights **a positive correlation between age and experience**, particularly noticeable after age 20, indicating that older customers tend to have more experience, which can inform targeted marketing and product strategies.

5. Identifying Top Customer Locations by ZIP Code:

Row Labels	Count of ZIP Code
94720	169
94305	127
95616	116

Description:

I have found this by using **Pivot Table and Conditional Formatting Rules**, **The top 3 areas (ZIP Codes) where the bank's customers are located**, based on customer counts, are **94720 with 169 customers**, **94305 with 127 customers**, and **95616 with 116 customers**. by creating a pivot table with ZIP Codes as row labels and subsequently sorting the pivot table to identify the areas with the highest customer concentration.

6. Customers With Combination Of Fixed Deposits, Credit Cards And Not Personal Loan:

Description:
            IF(AND(M2="Yes",O2="Yes",K2="No"),"FD-CC","Not a Combo")

A total of **147 customers have both Fixed Deposits and Credit Cards but do not have a Personal Loan**, as determined using the above formula, This combination suggests a specific group of customers within the bank's Customer Base.

7. Comparative Analysis of Median Income: Customers with Personal Loans vs. Customers without Personal Loans:

Description:
            The **median income of customers who have availed personal loans is 142.5**, while the **median income of those who have not is 59**. This suggests a notable income disparity between the two groups, which could impact targeting strategies and product suitability based on income levels. The median income is higher for those availed personal loans and it is lower for those who not availed a personal loan.
- For Customers with Personal Loans: Calculate the median income for customers who have availed personal loans.
- For Customers without Personal Loans: Calculate the median income for customers who have not availed personal loans.

8. Pivot Table Analysis: Summarizing Data by Percentages:

A. Education VS Personal Loan(Percentages %)

Education VS PL	Personal Loan		
Education	No	Yes	Grand Total
Graduate	24.42%	3.64%	28.06%
Professional	25.92%	4.10%	30.02%
Undergraduate	40.06%	1.86%	41.92%
Grand Total	**90.40%**	**9.60%**	**100.00%**
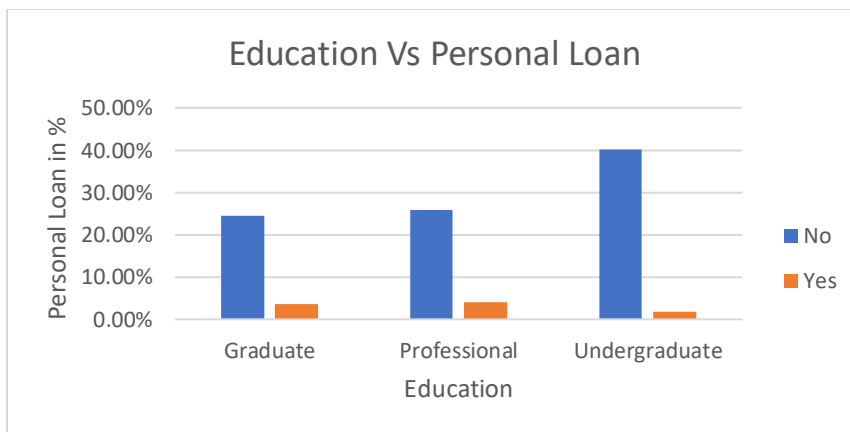
B. TD Account VS Personal Loan(Percentages %)

TD VS PL	PL		
TD Account	No	Yes	Grand Total
No	87.16%	6.80%	93.96%
Yes	3.24%	2.80%	6.04%
Grand Total	**90.40%**	**9.60%**	**100.00%**

C. Online VS Personal Loan(Percentages %)

Online Vs PL	Pl		
Online	No	Yes	Grand Total
No	36.54%	3.78%	40.32%
Yes	53.86%	5.82%	59.68%
Grand Total	**90.40%**	**9.60%**	**100.00%**

D. Income Category VS Personal Loan(Percentages %)

| Income Category Vs PL | PL | | |
Income Category	No	Yes	Grand Total
0-50	38.28%	0.00%	38.28%
100+	15.48%	8.76%	24.24%
51-100	36.64%	0.84%	37.48%
Grand Total	**90.40%**	**9.60%**	**100.00%**

9. Analysis of Pivot Tables and Identification of Key Categorical Variables:

a. Education VS Personal Loan(Percentages %)

The table illustrates the relationship between education levels and the uptake of Personal Loans (PL). Among education categories, **Undergraduate customers have the highest percentage (40.06%) of those without PL**, while **Professionals have the highest percentage (4.10%) with PL**. This suggests a correlation between education and PL adoption, with Professionals showing a relatively higher propensity to avail PL compared to Graduates and Undergraduates, as we can see in this the professionals and Graduates these two categories who has taken the more number of personal loan, and for further study we have to focus more on them.

b. TD Account VS Personal Loan(Percentages %)

The data analysis reveals a significant relationship between having a TD Account and availing Personal Loans among the bank's customers. Customers with **TD Accounts have a notably lower percentage (3.24%) of not having Personal Loans** compared to those **without TD Accounts (87.16%).** Conversely, a higher percentage of **TD Account holders (2.80%) have Personal Loans**, while a lower proportion of customers **without TD Accounts (6.80%) have availed** them. These findings suggest that the presence of a TD Account may influence the likelihood of having Personal Loans, which holds implications for targeted marketing and product offerings.

c. Online VS Personal Loan(Percentages %)

The most noticeable anomaly in the data is the significant difference in the percentage of **customers without online banking who do not have Personal Loans (36.54%)** compared to those **with online banking (53.86%)**. This suggests that a higher percentage of customers who **use online banking services do not have Personal Loans**, which is Surprising.

There is a noteworthy anomaly in the Personal Loan uptake. **Customers who use online banking have a higher percentage with Personal Loans (5.82%)** compared to **non-online banking users (3.78%)**. This unexpected higher percentage of online banking users with Personal Loans may indicate a unique trend worth exploring.

The most important categorical variable for further study is **"Online Banking Usage".** Understanding **why a higher percentage of online banking users do not have Personal Loans**, and yet a **higher percentage of them have Personal Loans compared to non-online banking users, is critical**.

Further investigation should explore factors such as the influence of online banking promotions, customer preferences, and the role of digital channels in Personal Loan adoption.

d. Income Category VS Personal Loan(Percentages %)

The most significant anomaly is that customers in the **"0-50" income category have a 0.00% rate of availing Personal Loans.** This anomaly suggests that customers in this income bracket do not seem to take Personal Loans, which is unusual compared to other income categories.

Another notable anomaly is the **relatively high percentage (8.76%) of customers in the "100+" income category who have availed Personal Loans.** This income group appears to have a disproportionately higher Personal Loan uptake compared to other income categories.

The most important categorical variable for further **study is "Income Category."** Exploring why **customers in the "0-50" income bracket are not availing Personal Loans despite their lower income levels** and why **those in the "100+" category have a relatively higher uptake is crucial.** Possible factors **could include income stability, financial needs, or loan eligibility criteria.**

10. Optimizing Personal Loan Marketing Campaign: Strategy Recommendations:

Recommendations:
- **Target Customers with "100+" Income:**
  Customers in the "100+" income category have shown a consistent interest in Personal Loans, with all 384 customers in this category accepting the offer. Therefore, it is advisable to continue targeting this income segment with tailored Personal Loan offers.

Income Category Vs Personal Loan	Personal loan		
Income Category	No	Yes	Grand Total
100+	701	384	1085
Grand Total	**701**	**384**	**1085**

- **Income Category vs. Securities Account:**
  Leverage Securities Account Information: Customers without Securities accounts are a subset of the total customer base (384 out of 701). To optimize the campaign, consider tailoring Personal Loan offers specifically to customers who Do not have Securities accounts. These customers have already shown an interest in additional financial services, making them potentially more receptive to Personal Loan offers.

Count of Personal Loan	Personal Loan		
Securities account	No	Yes	Grand Total
No	701	384	1085
Grand Total	**701**	**384**	**1085**

By Seeing Above Table Values, We can reach out to 1085 customers who are above 100+ income category and also the customers without a security account are the targeted customer range, in this 384 are the customers who already availed a personal loan we can only focus on the remaining 701 customers.

Segmentation Based on Income Category:

- Exclude 0-50 Income Category: As previously recommended, customers in the "0-50" income category have not accepted Personal Loan offers in the available data. It is advisable to exclude this income category from the marketing campaign, as it does not yield positive results.

- Focus on Responsive Categories: In addition to targeting the "100+" income category, also consider refining your strategy for the "51-100" income category. Although the acceptance rate in this category is relatively lower, it may still present an opportunity for conversions.

Continuous Monitoring: Continuously monitor campaign performance, especially within the targeted income categories and among customers with Securities accounts. Keep a close eye on acceptance rates and adjust strategies based on real-time data and feedback.

Cost Optimization: By focusing marketing efforts on income categories with a higher likelihood of acceptance and considering customers with Securities accounts, the bank can optimize its marketing spend and potentially achieve a better return on investment (ROI).

The recommendations aim to maximize campaign efficiency, target responsive income categories and customers with Securities accounts, and personalize marketing efforts to increase acceptance rates. Continuous monitoring and adaptation will be crucial for sustained campaign optimization.