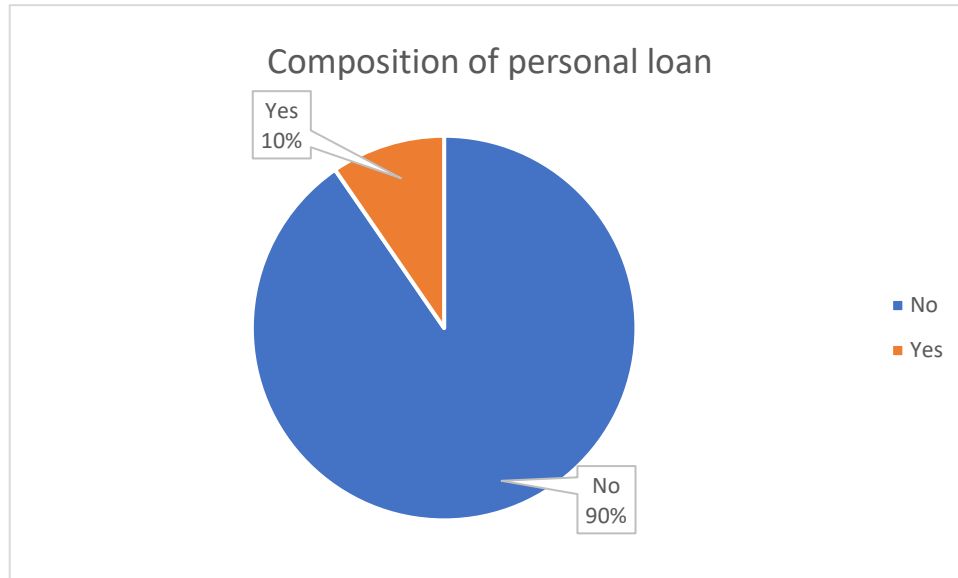


Business Report

Question 1: - What percentage of the bank's customers (according to the data) have availed Personal Loans?



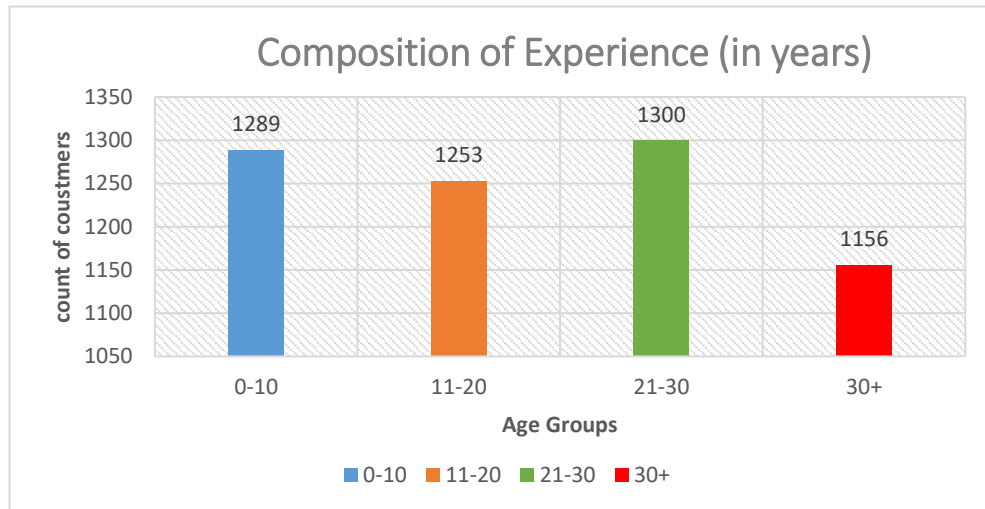
The total no of bank's customer are 5000 members and 4520 is of the numbers not taken the personal loan and 480 is of the numbers availed the personal Loan. 90.4% is percentage of not availed personal loan numbers 9.6% is percentage of availed personal loan numbers.

Question 2: - Generate a table with min, max, median & average for all numeric variables (age, experience, income, family members, CCAvg, Mortgage). What are your observations?

	A	B	C	D	E	F	G	H	I	J	K	L
	Age (in years)	Column1	Experience (in years)	Column2	Income (in K/year)	Column3	Family members	Column4	CCAvg	Column5	Mortgage	Column6
Mean		45.3384	Mean	20.1348	Mean	73.7742	Mean	2.3958	Mean	1.937938	Mean	56.4988
Median		45	Median	20	Median	64	Median	2	Median	1.5	Median	0
Minimum		23	Minimum	0	Minimum	8	Minimum	1	Minimum	0	Minimum	0
Maximum		67	Maximum	43	Maximum	224	Maximum	4	Maximum	10	Maximum	635

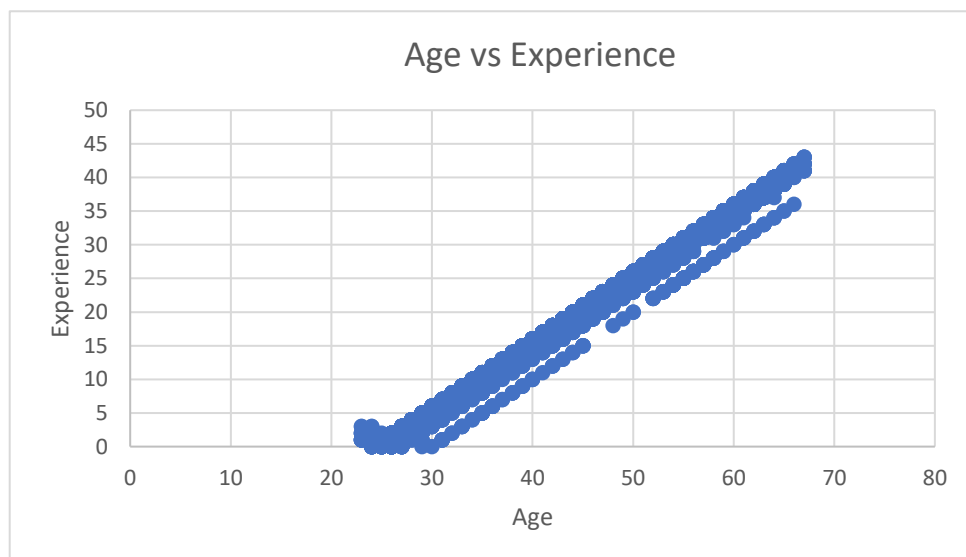
Here the above figure replicates about the mean, median, minimum, maximum of all the numeric values of bank's customers. The numeric values are like age, experience, income, family members, ccavg and mortgage. Maximum income of customers is 224 where as maximum mortgage is 635. The average age of bank's customers is 45. (Here mean is equals to average).

Question 3: - Create a new categorical variable for Experience using 4 categories – 0 to 10 years 11 to 20 years 21 to 30 years and 30+ years. Plot a bar graph for this new categorical variable.



The above graph gives a better insight about the experience of bank's customers. Experience of customers are categorized into 4 groups based on their experience (in years) in banking. The maximum number of customers are from 21-30 group and minimum number of customers are from 30+ group.

Question 4: - Create a scatter plot of the Age and the Experience variable. What do you observe?



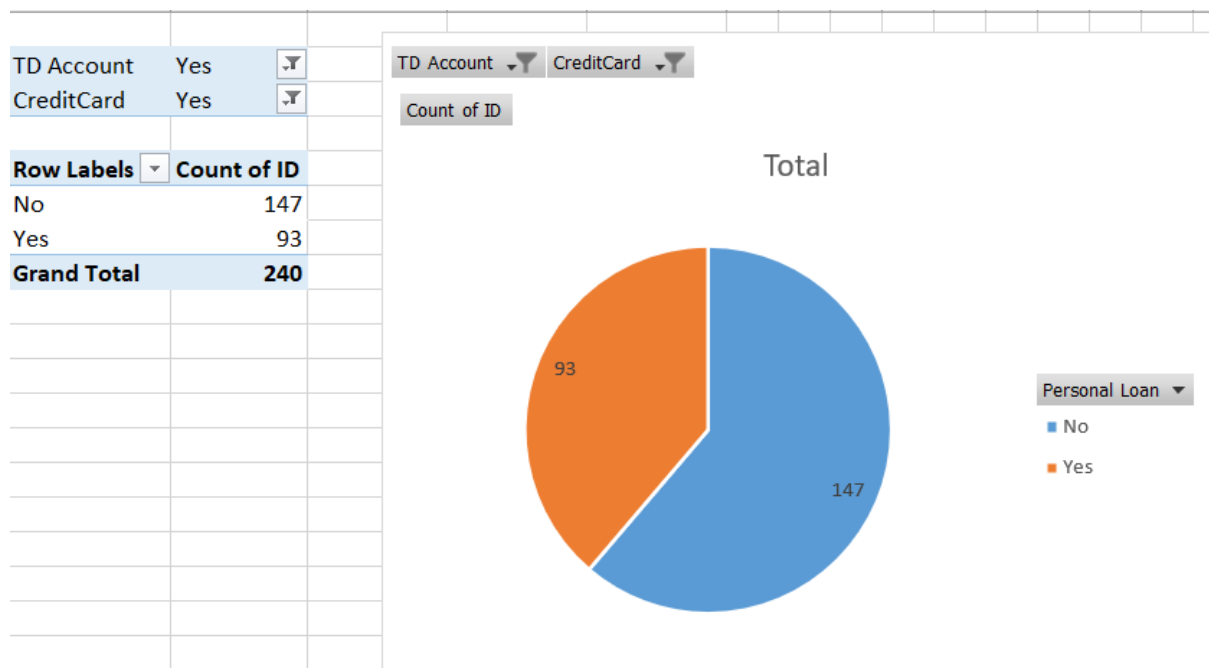
Age versus Experience scatter plot above represents that when age of customer increase then experience also increase and vice versa.

Question 5: - What are the top 3 areas (ZIP Codes) where the bank's customers are located?

Zip codes	count
94720	169
94305	127
95616	116
90095	71
93106	57
92037	54
93943	54
91320	53
91711	52

The top three areas where the bank's customers are located (zip codes) are 94720, 94305 and 95616. The count of customers is 169, 127 and 116 respectively.

Question 6: - How many customers have a combination of Fixed Deposits and Credit Cards but not Personal Loan?



The customers having combination of fixed deposits and credit cards but not personal loan is 147 and the customers having combination of fixed deposits and credit cards and also personal loan are 93. Here customers who does not have credit cards and fixed deposits are not included.

Question 7: - What is the median income of the customers who have availed personal loans and compare it with the median income of those customers who have not availed personal loans? What do you infer?

Median income of Personal loan availed	142.5	=MEDIAN(B2:B481)
Median income of Personal loan not availed	59	=MEDIAN(A2:A4521)

The median income of the customers who availed personal is 142.5 and the total no of customers who availed the personal loan is 480. The median income of the customers who does not availed the personal loan is 59 and the total no of customers who does not availed the personal loan 4520. Out of 5000 customers only 480 customers have availed the personal loan with some self interest and most of the customers did not choose personal loan.

Question 8: - Create 4 separate Pivot Tables. Summarise your data by percentages. Education vs Personal Loan, TD Account vs Personal Loan, Online vs Personal Loan, Income Category vs Personal Loan

Count of ID	Personal Loan		
TD Account	No	Yes	Grand Total
No	92.76%	7.24%	100.00%
Yes	53.64%	46.36%	100.00%
Grand Total	90.40%	9.60%	100.00%

Table-1:-TD vs Personal Loans

Count of ID	Personal Loan		
Education	No	Yes	Grand Total
Graduate	87.03%	12.97%	100.00%
Professional	86.34%	13.66%	100.00%
Undergraduate	95.56%	4.44%	100.00%
Grand Total	90.40%	9.60%	100.00%

Table-2:-Education vs Personal Loans

Count of ID	Personal Loan		
Income Category	No	Yes	Grand Total
0-50	100.00%	0.00%	100.00%
100+	63.86%	36.14%	100.00%
51-100	97.76%	2.24%	100.00%
Grand Total	90.40%	9.60%	100.00%

Table-3:-Income vs Personal Loans

Count of ID	Personal Loan		
Online	No	Yes	Grand Total
No	90.63%	9.38%	100.00%
Yes	90.25%	9.75%	100.00%
Grand Total	90.40%	9.60%	100.00%

Table-4:-Online vs Personal Loans

The above picture depicts four pivot tables of TD Account verses Personal loan, Education verses Personal loan, Income verses Personal loan and Online verses Personal loan. These tables give insights about availing of personal loan of the bank's customers. Highest access of personal loan is from the customers who are having an TD Account in the bank and the lowest access of personal loan is from the customers who are using an online account.

Question 9: - Analyse the Pivot tables created in the previous question and state any anomaly that you observe. Which categorical variables appear most important for your further study if you want to analyse which customers are most likely to take personal loans and why?

Count of ID	Personal Loan		
TD Account	No	Yes	Grand Total
No	92.76%	7.24%	100.00%
Yes	53.64%	46.36%	100.00%
Grand Total	90.40%	9.60%	100.00%

Count of ID	Personal Loan		
Education	No	Yes	Grand Total
Graduate	87.03%	12.97%	100.00%
Professional	86.34%	13.66%	100.00%
Undergraduate	95.56%	4.44%	100.00%
Grand Total	90.40%	9.60%	100.00%

Count of ID	Personal Loan		
Income Cat	No	Yes	Grand Total
0-50	100.00%	0.00%	100.00%
100+	63.86%	36.14%	100.00%
51-100	97.76%	2.24%	100.00%
Grand Total	90.40%	9.60%	100.00%

Count of ID	Personal Loan		
Online	No	Yes	Grand Total
No	90.63%	9.38%	100.00%
Yes	90.25%	9.75%	100.00%
Grand Total	90.40%	9.60%	100.00%

From table 1 i.e., TD vs Personal loan percentage of availing personal loan is 46.36% and not availing personal percentage is 53.64% for those who have a TD Account.

From table 2 i.e., Education vs Personal loan percentage of availing personal loan is greater from professional which is 13.66% and lower from undergraduates which is 4.44%.

From table 3 i.e., Income Categorial vs Personal loan customers who are having an income above 100 are much focused in availing the personal loan whose percentage is 36.14% when compared to the other customers with lesser income.

From table 4 i.e., Online vs Personal loan we can say that the online category is not affecting for Availing of Personal Loans because the differences of yes and no category results are very close i.e. (9.75% & 9.38%).

Hence customers who are having an TD Account in the bank are most likely to avail the personal loan and customers who are using an online account are the lowest likely customers to avail the personal loan

Question 10: - In the last campaign, bank reached out to 5000 customers out of which 480 customers accepted the personal loan offer. The bank incurred a huge cost in running a marketing campaign to reach out to so many customers. This is where you as a strategic business consultant step in. You are tasked to optimise the cost of this campaign by identifying the correct target base (without significant reduction in number of acceptances of offers). The bank can then send Personal Loan offers to these target customers who have a higher chance of accepting the offer. Based on your analysis, what strategy would you suggest to the management of HBFC bank?

Education	TD Account	Income Categorical	Taken Personal Loan
Graduate	Yes	100+	96.15%
Professional	Yes	100+	94.44%
Graduate	No	100+	73.75%
Professional	No	100+	72.92%
Undergraduate	Yes	100+	49.06%
Graduate	Yes	51-100	29.41%
Undergraduate	Yes	51-100	18.18%
Professional	Yes	51-100	9.09%
Undergraduate	No	100+	7.56%
Professional	No	51-100	2.02%
Graduate	No	51-100	1.73%
Undergraduate	No	51-100	1.16%
Undergraduate	Yes	0-50	0.00%
Undergraduate	No	0-50	0.00%
Graduate	Yes	0-50	0.00%
Graduate	No	0-50	0.00%
Professional	Yes	0-50	0.00%
Professional	No	0-50	0.00%

By Evaluating the results of Pivot Table for Education, Term deposits (TD Account) and Income category we can state that who have a TD Account and income of 100+ have a high chance of availing the personal loan. But we ignore the persons who have 0-50 income category so if we have the budget limit, I would prefer to call the top 5 rows according to the table. Here top 5 have an income of 100+ and most of them are having a TD Account in the bank.