

# Capstone Project - Personal Loan

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# PROBLEM STATEMENT

Thera Bank's management is seeking avenues to transform its liability customers into personal loan clients. Following a successful campaign last year targeting liability customers, which achieved an impressive conversion rate of over 9%, the retail marketing department is now focused on developing more targeted campaigns to enhance the success ratio while optimizing the budget.

The purpose of this analysis is to investigate which customer profiles are inclined to accept a personal loan offer and to formulate a strategy based on the findings.

# DATASET

- ▶ The dataset is retrieved from the below link.

<https://www.kaggle.com/datasets/teertha/personal-loan-modeling/data>

- ▶ The 14 columns available are

- |              |             |                      |               |
|--------------|-------------|----------------------|---------------|
| ▶ ID         | ▶ ZIP Code  | ▶ Mortgage           | ▶ Online      |
| ▶ Age        | ▶ Family    | ▶ Personal Loan      | ▶ Credit Card |
| ▶ Experience | ▶ CCAvg     | ▶ Securities Account |               |
| ▶ Income     | ▶ Education | ▶ CD Account         |               |

- ▶ We will limit our analysis to only 8 columns, which are highlighted in green, out of the total 14 columns available.

# DATA DICTIONARY

- ▶ ID
  - Customer ID
- ▶ Age
  - Customer's age in completed years
- ▶ Experience
  - Number of years of professional experience
- ▶ Income
  - Annual income of the customer(\$000)
- ▶ ZIP Code
  - Home Address ZIP code
- ▶ Family
  - Family size of customer
- ▶ CCAvg
  - Average spending on credit card per month(\$000)

# DATA DICTIONARY (contd...)

## ▶ Education

Education Level. 1: Undergrad; 2: Graduate; 3: Advanced/Professional

## ▶ Mortgage

Value of house mortgage if any. (\$000)

## ▶ Personal Loan

Did this customer accept the personal loan offered in the last campaign?

## ▶ Securities Account

Does the customer have a securities account with the bank?

## ▶ CD Account

Does the customer have a certificate of deposit (CD) account with the bank?

## ▶ Online

Does the customer use internet banking facilities?

## ▶ Credit Card

Does the customer use a credit card issued by this Bank?

ID	Age	Experience	Income	ZIP Code	Family	CCAvg	Education	Mortgage	Personal Loan	Securities Account	CD Account	Online	CreditCard
1	25	1	49	91107	4	1.6	1	0	0	1	0	0	0
2	45	19	34	90089	3	1.5	1	0	0	1	0	0	0
3	39	15	11	94720	1	1	1	0	0	0	0	0	0
4	35	9	100	94112	1	2.7	2	0	0	0	0	0	0
5	35	8	45	91330	4	1	2	0	0	0	0	0	1
6	37	13	29	92121	4	0.4	2	155	0	0	0	1	0
7	53	27	72	91711	2	1.5	2	0	0	0	0	1	0
8	50	24	22	93943	1	0.3	3	0	0	0	0	0	1
9	35	10	81	90089	3	0.6	2	104	0	0	0	1	0
10	34	9	180	93023	1	8.9	3	0	1	0	0	0	0
11	65	39	105	94710	4	2.4	3	0	0	0	0	0	0
12	29	5	45	90277	3	0.1	2	0	0	0	0	1	0
13	48	23	114	93106	2	3.8	3	0	0	1	0	0	0
14	59	32	40	94920	4	2.5	2	0	0	0	0	1	0
15	67	41	112	91741	1	2	1	0	0	1	0	0	0
16	60	30	22	95054	1	1.5	3	0	0	0	0	1	1
17	38	14	130	95010	4	4.7	3	134	1	0	0	0	0
18	42	18	81	94305	4	2.4	1	0	0	0	0	0	0
19	46	21	193	91604	2	8.1	3	0	1	0	0	0	0



ID	Age	Experience	Income	ZIP Code	Family	CCAvg	Education	Mortgage	Personal Loan	Securities Account	CD Account	Online	CreditCard
1	25	1	49	91107	4	1.6	Undergrad	0	NO	YES	NO	NO	NO
2	45	19	34	90089	3	1.5	Undergrad	0	NO	YES	NO	NO	NO
3	39	15	11	94720	1	1	Undergrad	0	NO	NO	NO	NO	NO
4	35	9	100	94112	1	2.7	Graduate	0	NO	NO	NO	NO	NO
5	35	8	45	91330	4	1	Graduate	0	NO	NO	NO	NO	YES
6	37	13	29	92121	4	0.4	Graduate	155	NO	NO	NO	YES	NO
7	53	27	72	91711	2	1.5	Graduate	0	NO	NO	NO	YES	NO
8	50	24	22	93943	1	0.3	Advanced/Professional	0	NO	NO	NO	NO	YES
9	35	10	81	90089	3	0.6	Graduate	104	NO	NO	NO	YES	NO
10	34	9	180	93023	1	8.9	Advanced/Professional	0	YES	NO	NO	NO	NO
11	65	39	105	94710	4	2.4	Advanced/Professional	0	NO	NO	NO	NO	NO
12	29	5	45	90277	3	0.1	Graduate	0	NO	NO	NO	YES	NO
13	48	23	114	93106	2	3.8	Advanced/Professional	0	NO	YES	NO	NO	NO
14	59	32	40	94920	4	2.5	Graduate	0	NO	NO	NO	YES	NO
15	67	41	112	91741	1	2	Undergrad	0	NO	YES	NO	NO	NO
16	60	30	22	95054	1	1.5	Advanced/Professional	0	NO	NO	NO	YES	YES
17	38	14	130	95010	4	4.7	Advanced/Professional	134	YES	NO	NO	NO	NO
18	42	18	81	94305	4	2.4	Undergrad	0	NO	NO	NO	NO	NO
19	46	21	193	91604	2	8.1	Advanced/Professional	0	YES	NO	NO	NO	NO

DATA  
PREPARATION

# DATA PREPARATION (contd...)

- ▶ Column “Education” is stated as 1, 2 and 3 which represents Undergrad, Graduate, Advanced / Professional respectively.
  - ▶ To avoid confusion, the data source has been updated to Undergrad, Graduate, Advanced / Professional.
- ▶ Columns “Personal Loan”, “Securities Account” and “CD Account” are stated as 1 and 0 which represents YES and NO respectively.
  - ▶ To avoid confusion, the data source has been to YES and NO.

# Tableau - Storyboard Contents

The following are the contents of storyboard in Tableau

- ▶ Overview
- ▶ Education
- ▶ Family / CD / Security
- ▶ Mortgage
- ▶ Income and CCAvg

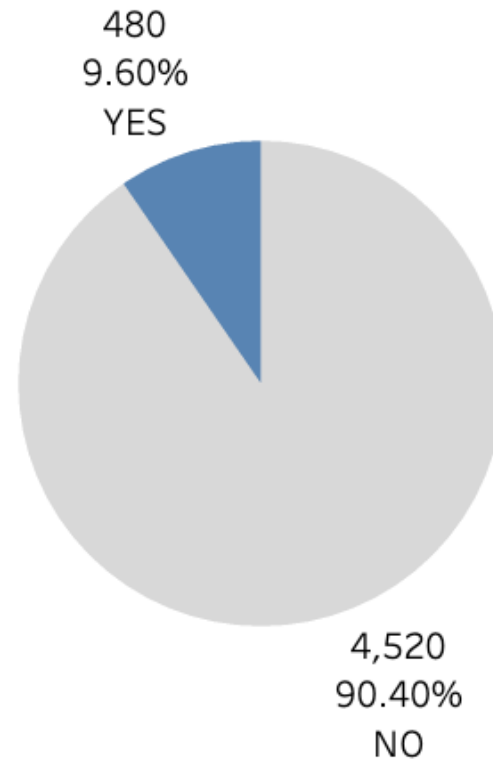
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# Overview

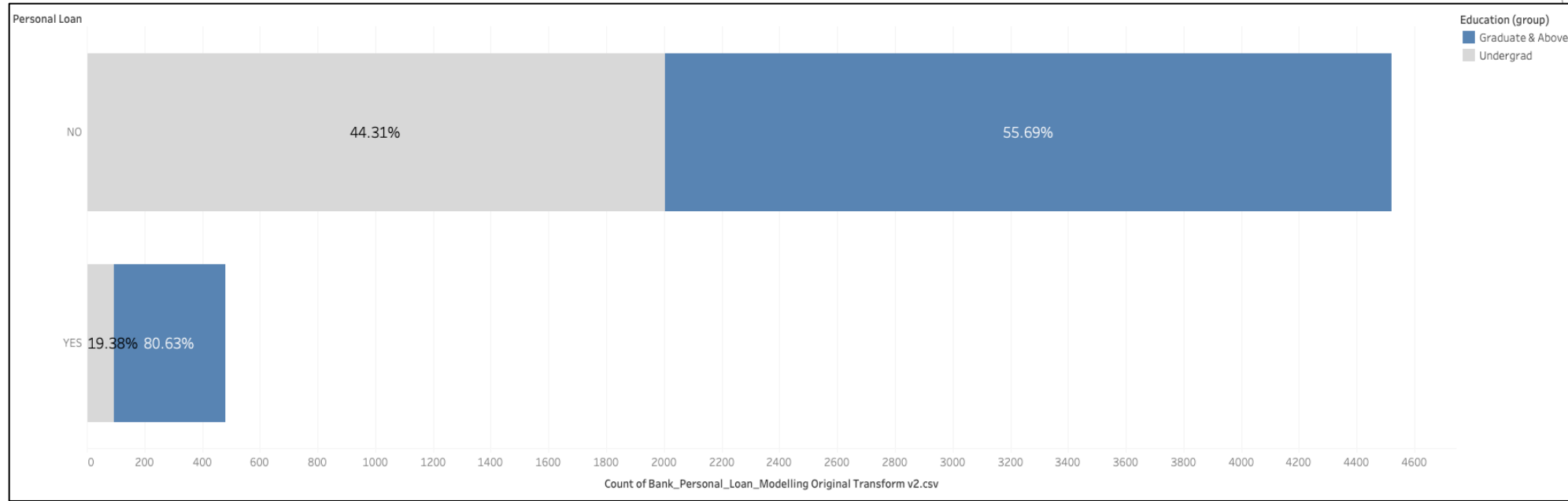
9.6 %

customers accepted Personal Loan offer



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# Education



- ▶ The stacked bar chart for education shows “Number of Customers” vs “Personal Loan” stacked by “Education”
- ▶ Education is grouped into Undergrad and Graduate & Above. Graduate & Above is composed of Graduate and Advanced/Professional data.

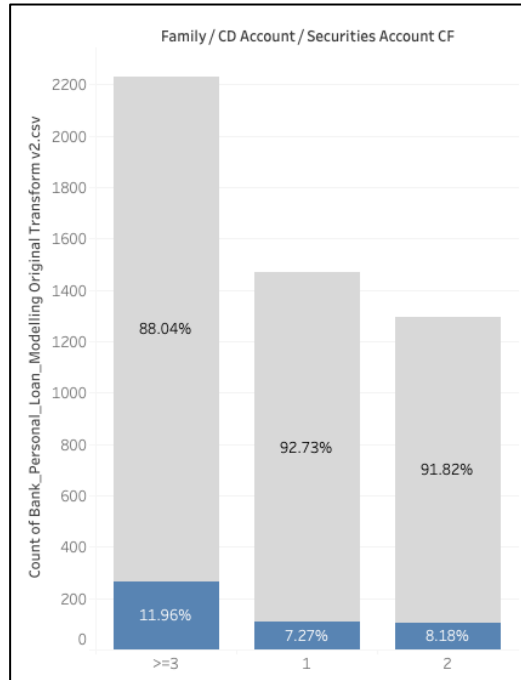
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# Education - Findings

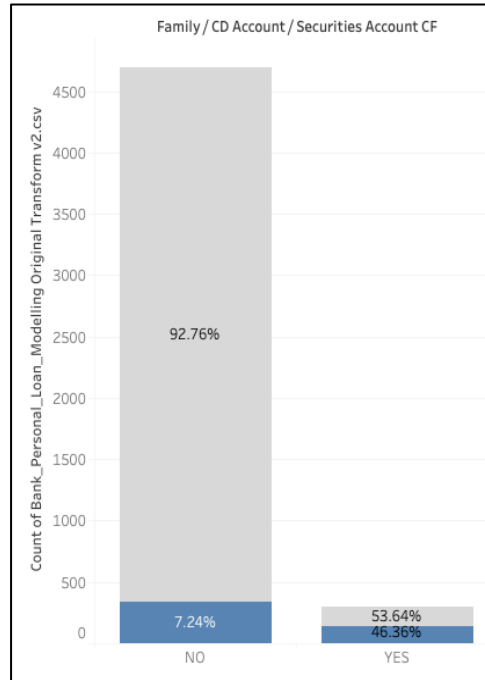
- ▶ The majority, or 80%, of customers who have accepted the personal loan offer possess an education level of Graduate and Above.

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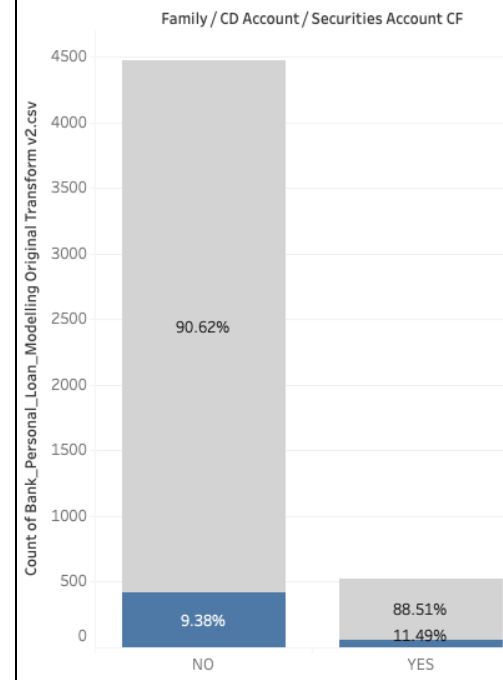
# Family/CD/Security



Family



CD Account



Securities Account

Personal Loan  
NO  
YES

- ▶ The stacked bar chart shows “Number of Customers” vs “Family Size”, “CD Account” and “Securities Account” stacked by “Personal Loan”.
- ▶ Family Sizes of 3 and 4 are grouped into “>=3”.

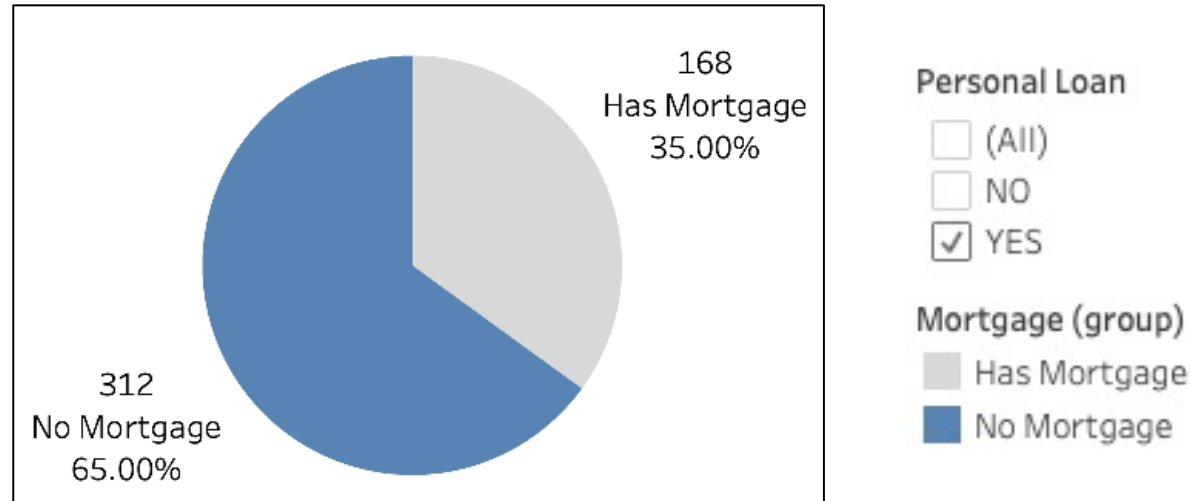
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# Family/CD/Security - Findings

- ▶ A greater number of personal loan acceptances is observed among larger families, specifically those with a family size greater than 2.
- ▶ Around 1 in 2 customers who possess a CD Account have opted to accept the personal loan offer.
- ▶ A total of 11% of customers who maintain a securities account with the bank have chosen to accept the personal loan offer.

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# Mortgage



- ▶ The pie chart shows the distribution of customers with mortgage and without mortgage who have taken personal loan.
- ▶ Mortgage is grouped into two groups. Customers with mortgage value 0 are grouped into “No Mortgage” group and with mortgage value greater than 0 are grouped into “Has Mortgage” group.

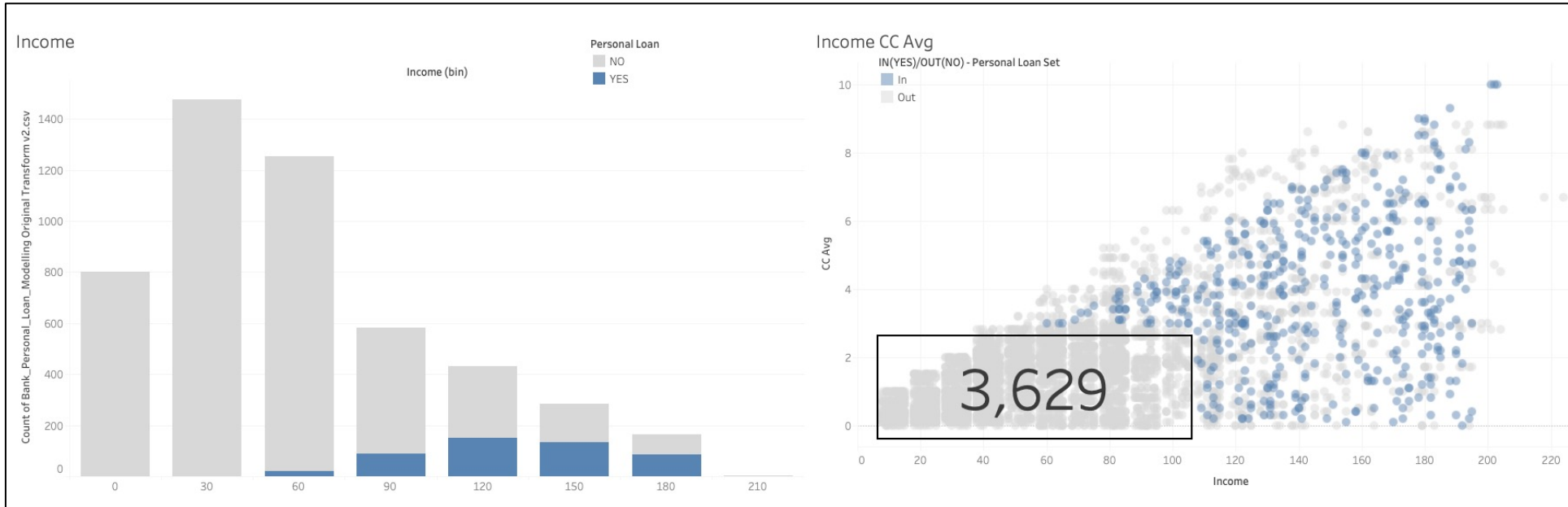
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# Mortgage - Findings

- ▶ Among customers who have accepted personal loans, 65% do not have a mortgage, while those with a mortgage constitute only 35% of the total.

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# Income and CCAvg



- ▶ The stacked bar chart depicts “No of Customers” vs “Income” stacked by “Personal Loan”. Income range is grouped with bin each having a range of 30.
- ▶ The scatter plot shows the distribution of “CCAvg” vs “Income” with “Personal Loan”. Customers who have accepted the personal loan are in the “Personal Loan Set”.

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# Income and CCAvg - Findings

- ▶ Customers earning more than 60k per year exhibit a higher acceptance rate for personal loans.
- ▶ It is evident that customers earning less than 100k per year and with less than 3000 monthly average credit card spending have refrained from accepting the personal loan offer. The number of customers falling into this category is 3629, which represents approximately 72% of the total 5000 customers.

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# Recommendations

- ▶ Greater attention should be directed towards customers with a higher level of education when extending personal loan offers.
- ▶ Customers with larger families demonstrate a greater inclination to accept personal loans. Therefore, directing efforts toward targeting these customers is likely to yield beneficial results.
- ▶ Since the number of individuals from smaller-sized families who accepted the offer is lower, crafting specially tailored personal loan offers for people in this demography could be advantageous.

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# Recommendations

- ▶ Considering from a customer's viewpoint, obtaining a personal loan can be an additional burden, for those with an existing mortgage, which is already a liability. Therefore, it is advisable to place greater emphasis on customers without a mortgage.
- ▶ Focusing on customers with an income of 60K and above is likely to yield favorable outcomes.
- ▶ Customers categorized as having low income (<100k) and low CCAvg (<3k) constitute 72% of the total. However, none of these customers have accepted the loan offer. Therefore, the bank may consider devising a more appealing offer specifically tailored for this demographic.

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THANK YOU