•Welcome

TO

THE BANKING WORLD

MAJOR PROJECT
ON
CREDIT RISK ANALYTICS
(BONDORA BANK)

BY

Members of Team F

Internship Program

Under the Guidance of:

EVOASTRA VENTURES

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About the Case Study

The loan providing companies(like Bank or other financial Institutions) find it hard to give loans to the people due to their insufficient or non-existent credit history. Because of that, some consumers use it to their advantage by becoming a defaulter.

When the company receives a loan application, the company has to decide for loan approval based on the applicant's profile. Two types of risks are associated with the bank's decision: If the applicant is likely to repay the loan, then not approving the loan results in a loss of business to the company If the applicant is not likely to repay the loan, i.e. he/she is likely to default, then approving the loan may lead to a financial loss for the company.

Data Set Explanation

PREVIOUS APPLICATION DATA

1048576 numbers of Rows

38 numbers of Columns

APPLICATION DATA

307512 numbers of Rows

122 numbers of Columns

AFTER CLEANING & TAKING IMPORTANT DATA

PREVIOUS APPLICATION NEW DATA

664066 numbers of Rows

9 numbers of Columns

APPLICATION NEW DATA

276480 numbers of Rows

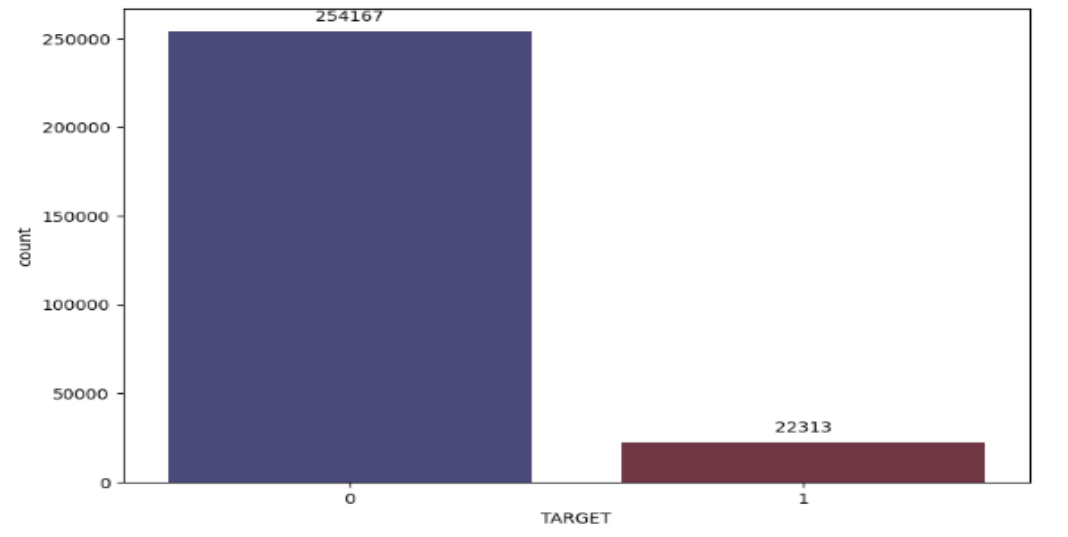
13 numbers of Columns

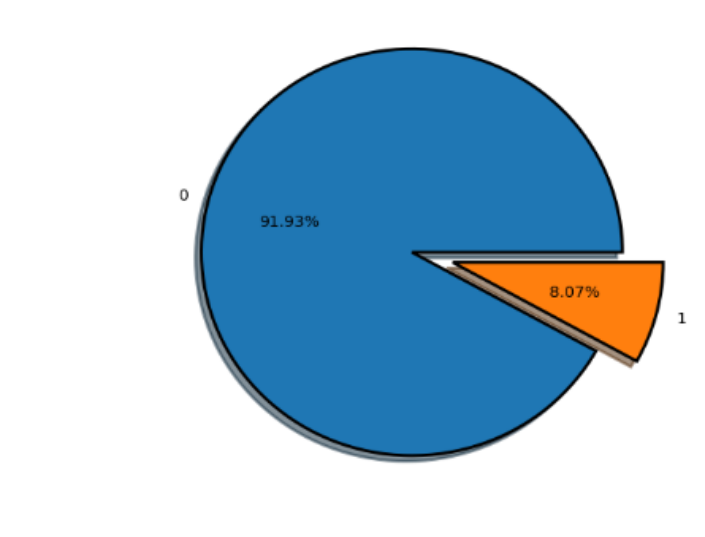
Target Variable

1 ⟹ AS REPRESENTING A LOAN THAT DEFAULTED

AND

0 ⟹ AS A LOAN THAT WAS SUCCESSFULLY APPROVED AND REPAID.





Identification of Loan

CASH LOAN

A CASH LOAN IS A LOAN WHICH IS RECEIVED BY THE BORROWER IN CASH.

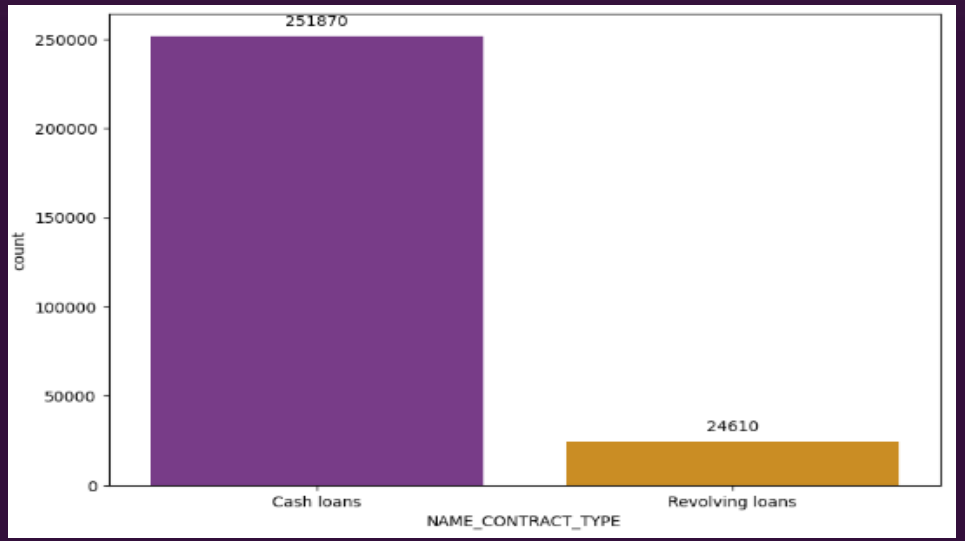
THIS SETS IT APART FROM OVERDRAFT LOANS, INSTALLMENT LOANS AND LEASES.

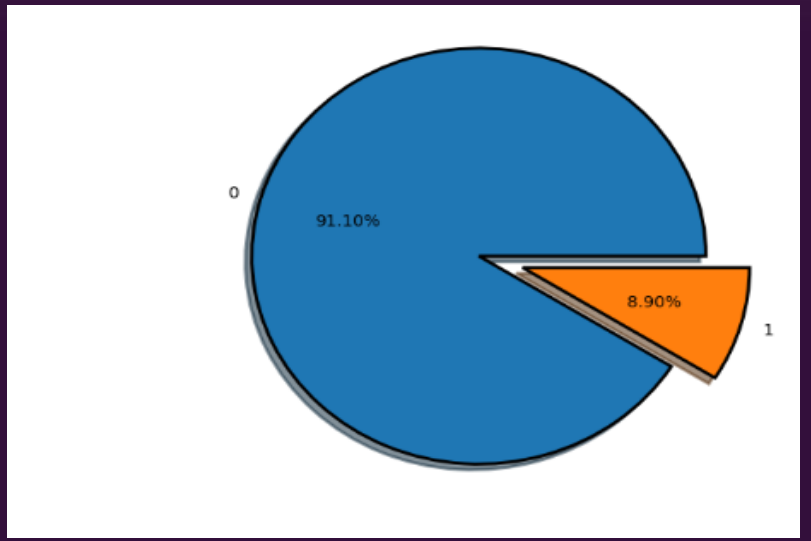
CASH LOANS MAY BE GIVEN TO A PRIVATE INDIVIDUAL AS A PERSONAL LOAN OR TO A BUSINESS AS A BUSINESS LOAN.

REVOLVING LOAN

A REVOLVING CREDIT FACILITY IS A TYPE OF CREDIT THAT DOES NOT HAVE A FIXED NUMBER OF PAYMENTS.

IT ALLOWS YOU TO USE A LINE OF CREDIT UP TO A SPECIFIED LIMIT. THIS MEANS YOU CAN REPEATEDLY ACCESS THE CREDIT AS LONG AS YOU DO NOT EXCEED THE SET CREDIT LIMIT AND CONTINUE MAKING TIMELY PAYMENTS. A CREDIT CARD IS AN EXAMPLE OF A FINANCIAL INSTRUMENT THAT OFFERS A REVOLVING CREDIT.





Identification of Loan on Previous application

CONSUMER LOAN

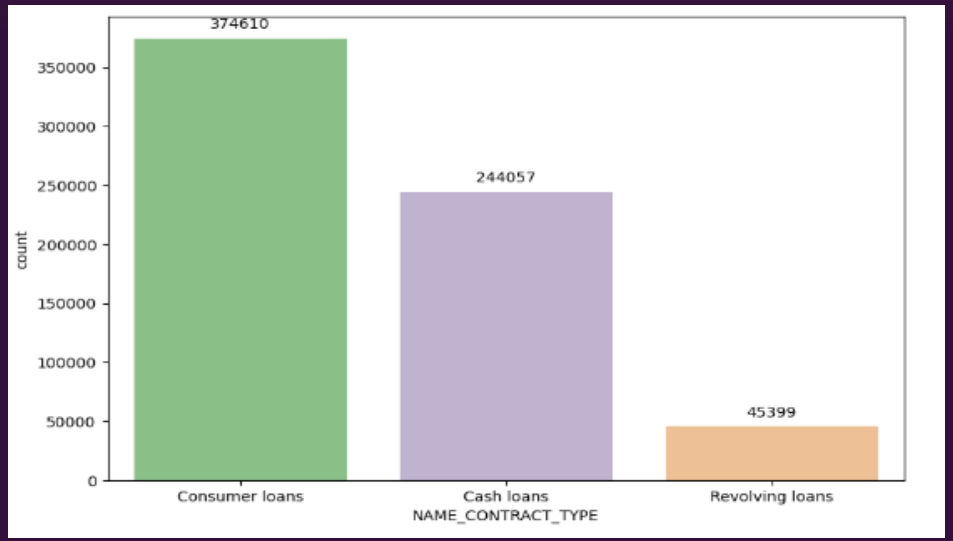
CASH LOAN

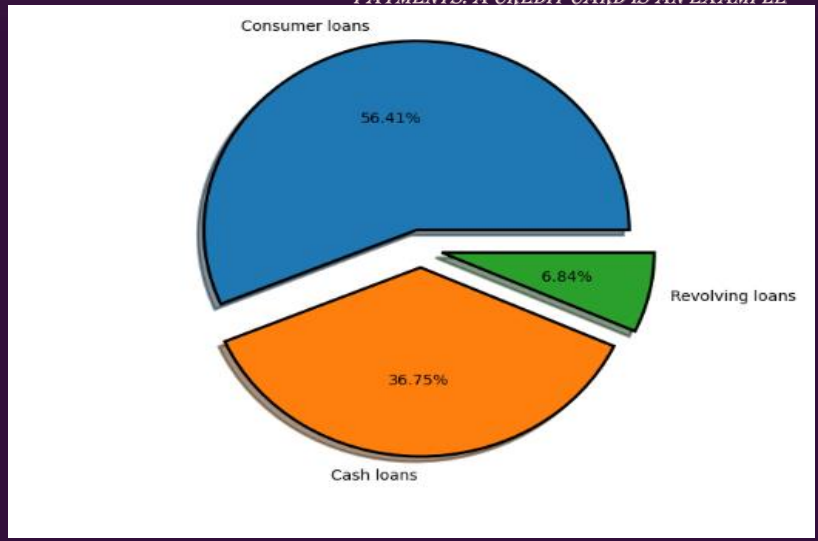
A CASH LOAN IS A LOAN WHICH IS RECEIVED BY THE BORROWER IN CASH.
THIS SETS IT APART FROM OVERDRAFT LOANS, INSTALLMENT LOANS AND LEASES.
CASH LOANS MAY BE GIVEN TO A PRIVATE INDIVIDUAL AS A PERSONAL LOAN OR
TO A BUSINESS AS A BUSINESS LOAN.

A CONSUMER LOAN IS A LOAN THAT BANKS OFFER TO CUSTOMERS TO BUY HOUSEHOLD GOODS AND APPLIANCES AND EVEN PERSONAL DEVICES. THESE INCLUDE TELEVISION SETS, AIR-CONDITIONERS, HOME THEATRE SYSTEMS, REFRIGERATORS, LAPTOPS, MOBILE PHONES, CAMERAS AND EVEN MODULAR KITCHENS.

REVOLVING LOAN

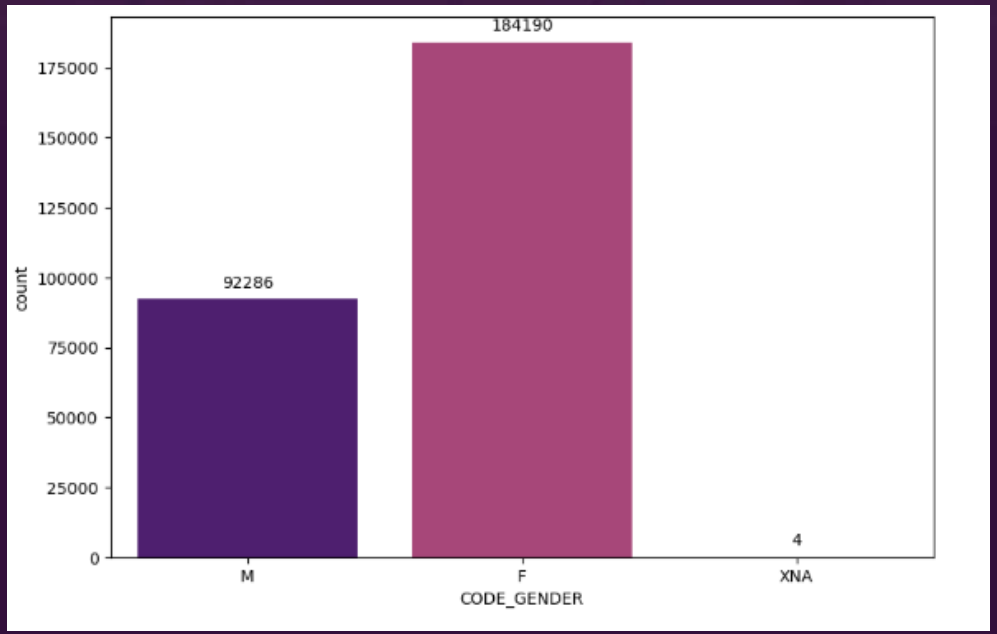
A REVOLVING CREDIT FACILITY IS A TYPE OF CREDIT THAT DOES NOT HAVE A FIXED NUMBER OF PAYMENTS.
IT ALLOWS YOU TO USE A LINE OF CREDIT UP TO A SPECIFIED LIMIT. THIS MEANS YOU CAN REPEATEDLY
ACCESS THE CREDIT AS LONG AS YOU DO NOT EXCEED THE SET CREDIT LIMIT AND CONTINUE MAKING TIMELY
PAYMENTS. A CREDIT CARD IS AN EXAMPLE

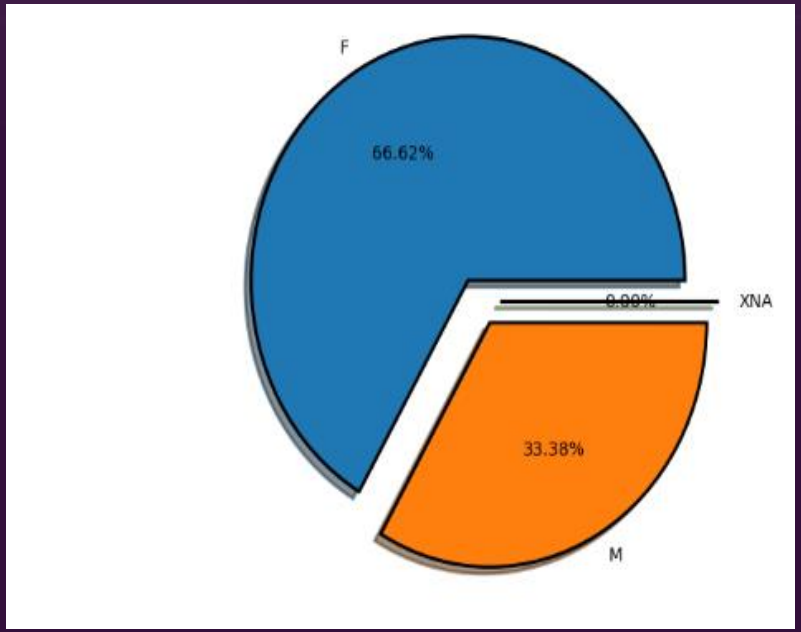




Types of Gender

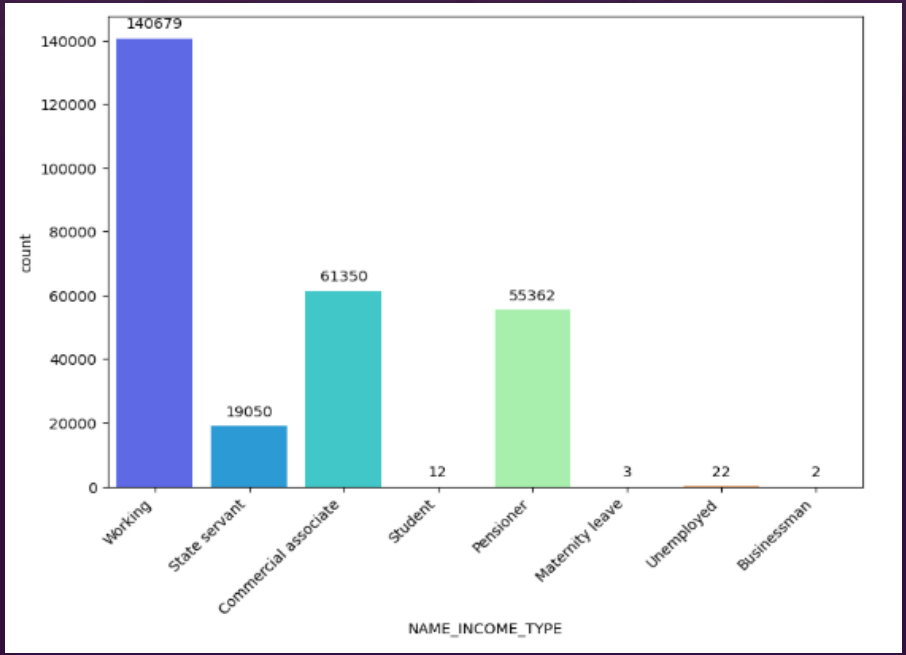
- 3 TYPES OF GENDER ARE THERE : MALE , FEMALE AND TRANSGENDER

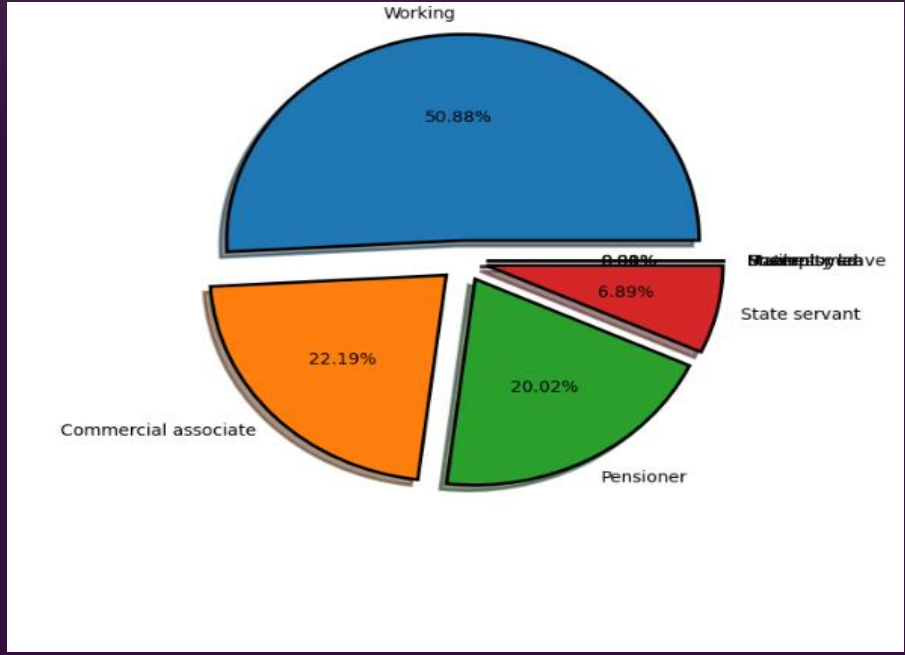




Income Type

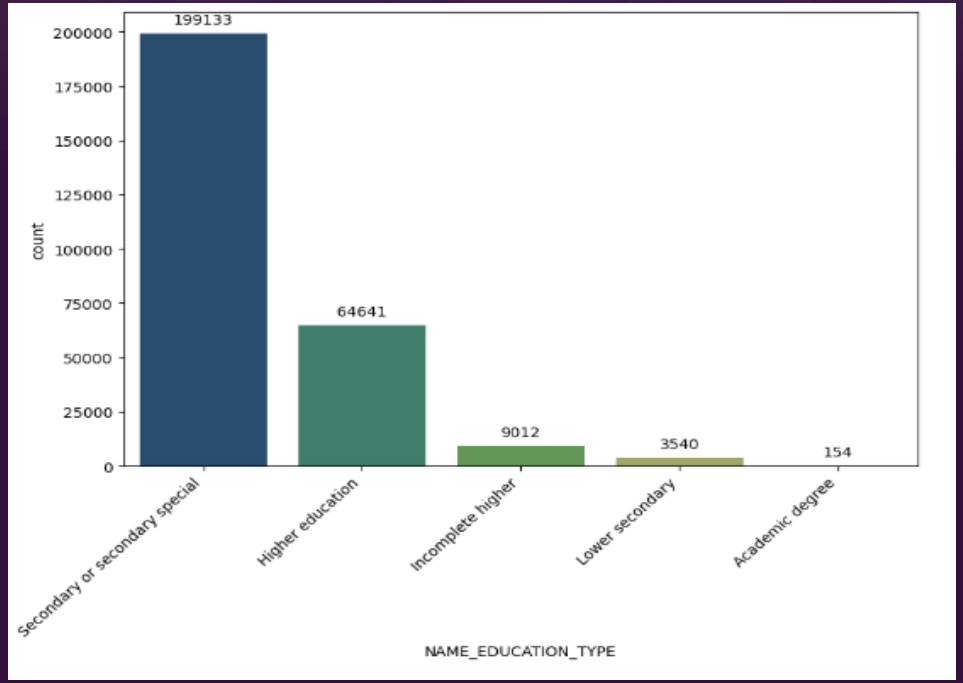
- Source of income is vital component in terms of getting loan from bank. Here we can see 8 types of income.

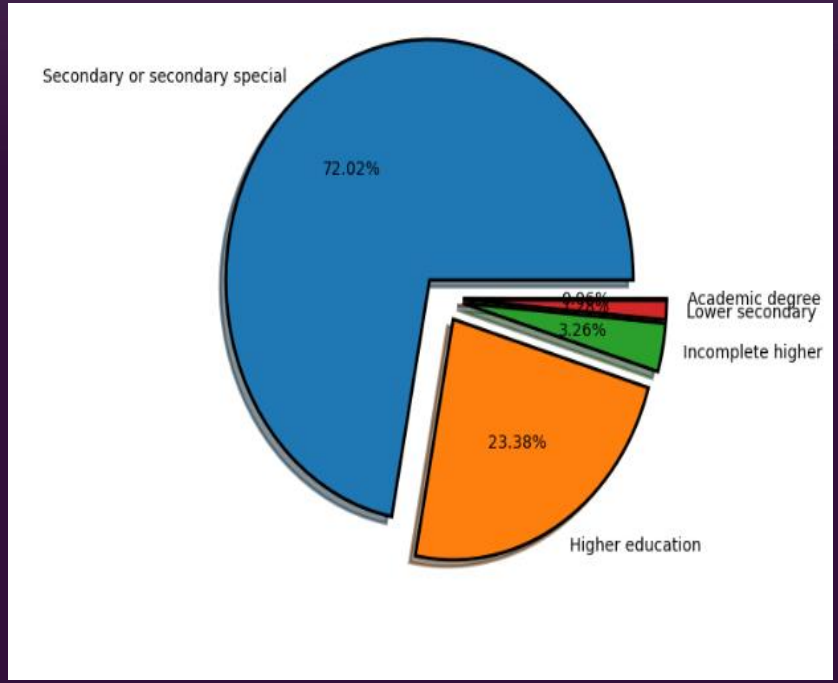




Education Achieved

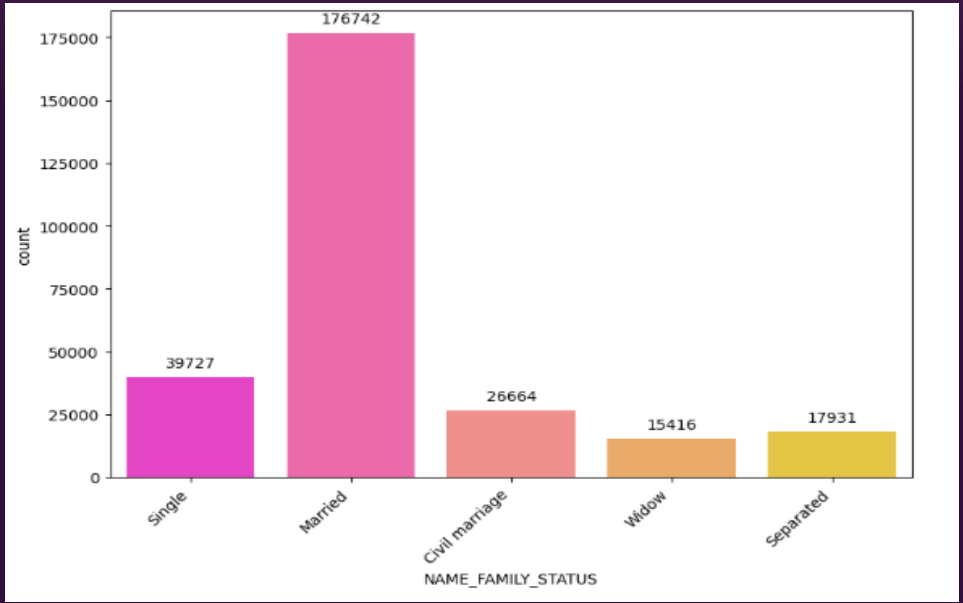
- **QUALIFICATION ACHIEVED BY THE CLIENT OR CONSUMER OF THE BANK.**

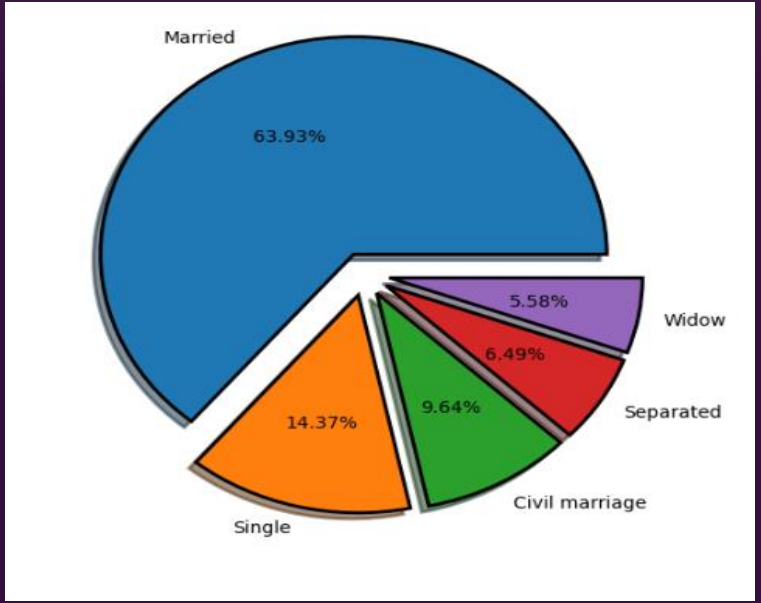




Civil Status of client

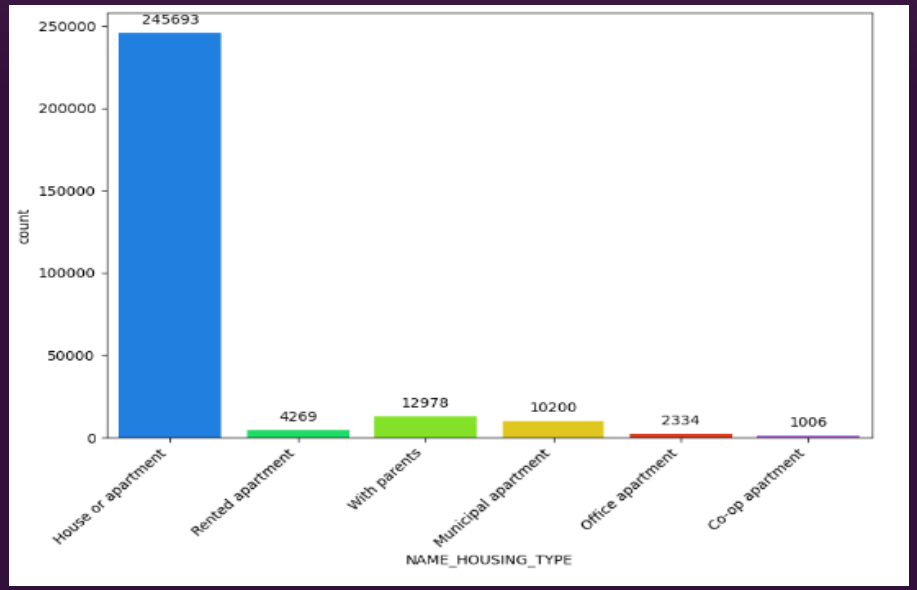
- IN TERMS OF LOAN PROVIDED BY THE BANK, CIVIL STATUS OR MARITAL STATUS CAN IMPACT THE MORTGAGE ELIGIBILITY & INTEREST RATE IN INDIA.

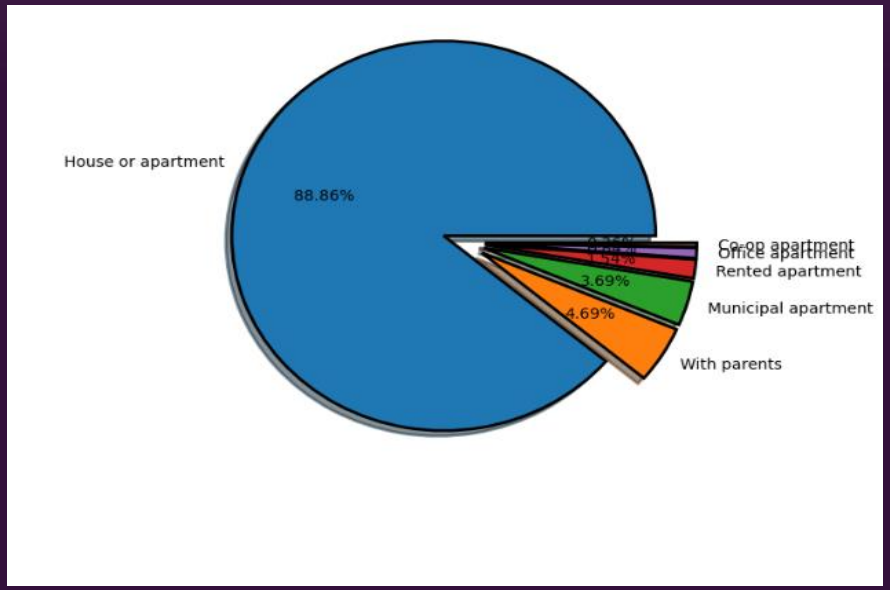




Property type

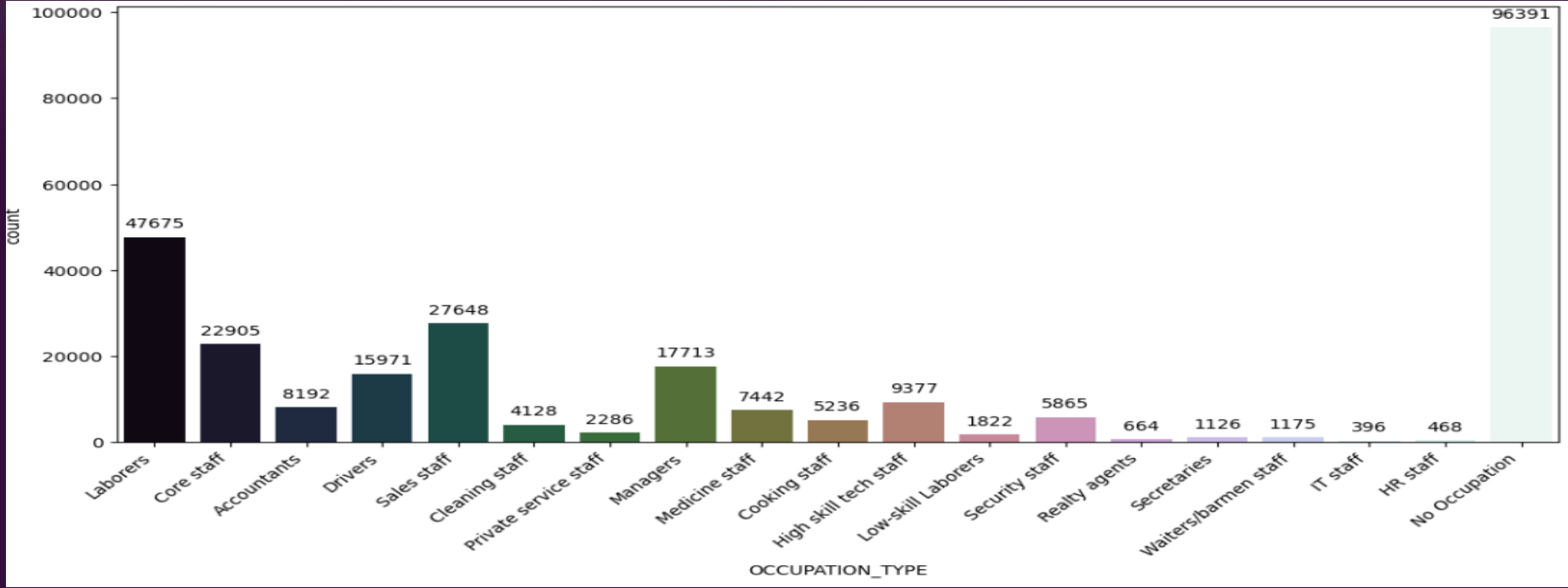
- ***PROPERTY TYPE IS MUCH MORE IMPORTANT IN TERMS OF GETTING LOAN. MORTGAGE LOAN IS ONE OF THE EXAMPLE OF BANK LOAN.***





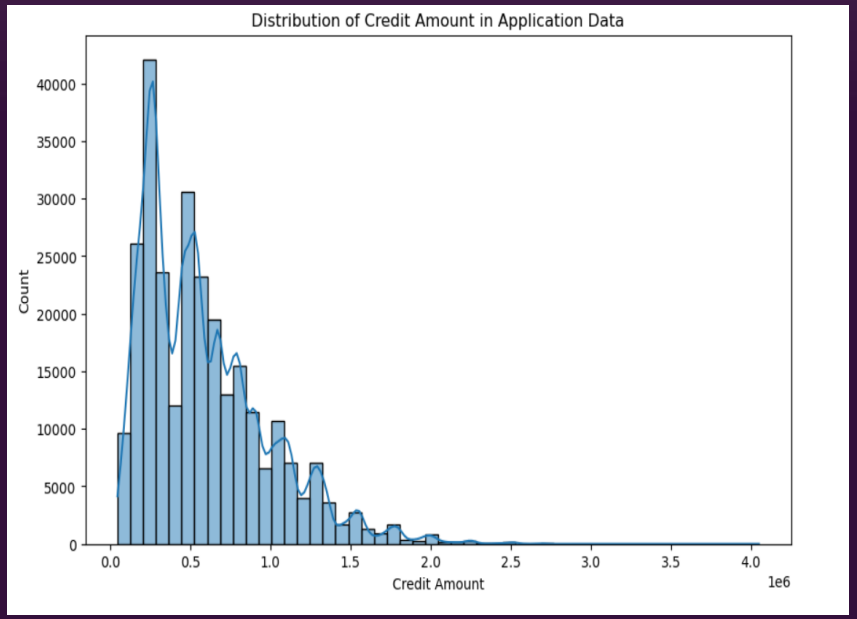
Occupation type

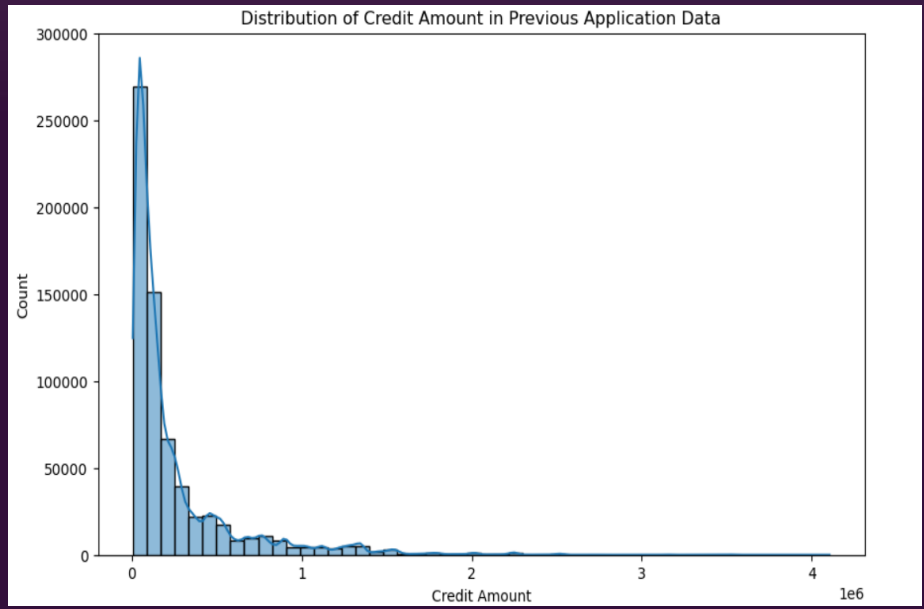
- SOURCE OF INCOME IS MUCH MORE VITAL IN REPAYING & GETTING THE LOAN FROM ANY FINANCIAL INSTITUTIONS.



Credit Amount

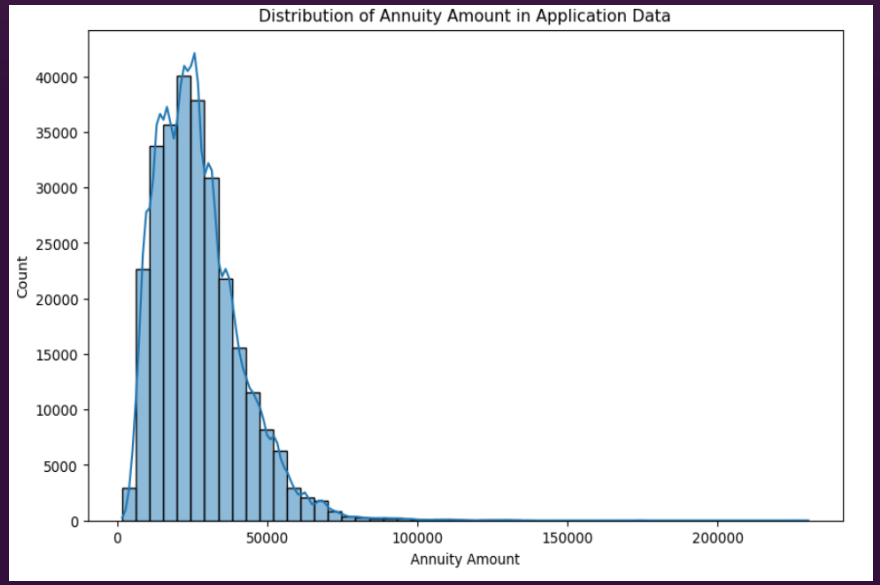
- THE BANK CREDIT IS THE TOTAL AMOUNT OF MONEY THAT A PERSON OR BUSINESS CAN BORROW FROM A BANK.
- HERE IN THE DATA POINT WE CAN SEE THAT AVERAGE CREDIT AMOUNT IS 5LAKHS 92 THOUSANDS IN APPLICATION DATA WHERE AS IN PREVIOUS APPLICATION DATA IS 2LAKHS 46 THOUSANDS.

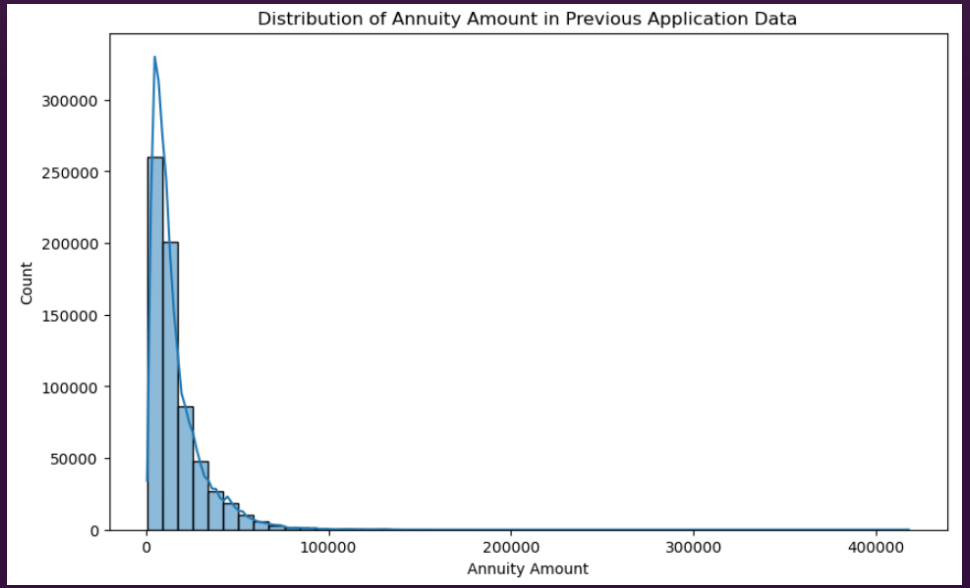




Annuity amount

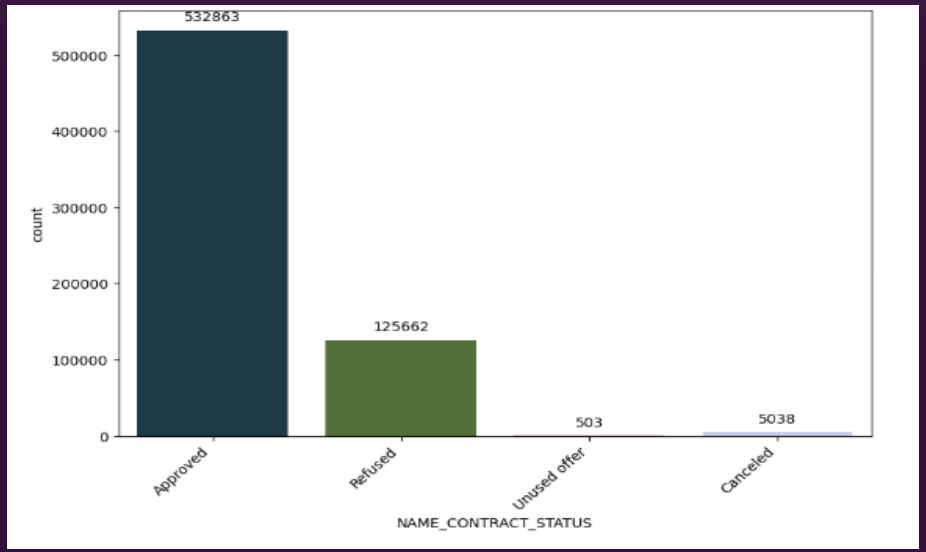
- A PERSON PAYS EITHER A LUMP SUM AMOUNT OR REGULAR INSTALMENTS IN THE GIVEN PERIOD TO GET REGULAR PAYMENTS OR PAYOUTS AS LONG AS HE/SHE LIVES OR FOR A PRE-SPECIFIED FIXED PERIOD.
- AS PER DATA SET OF THE BOTH CURRENT & PREVIOUS APPLICATION IT SUGGEST THAT AVERAGE ANNUITY AMOUNT IS 26 THOUSANDS & 15 THOUSANDS RESPECTIVELY.

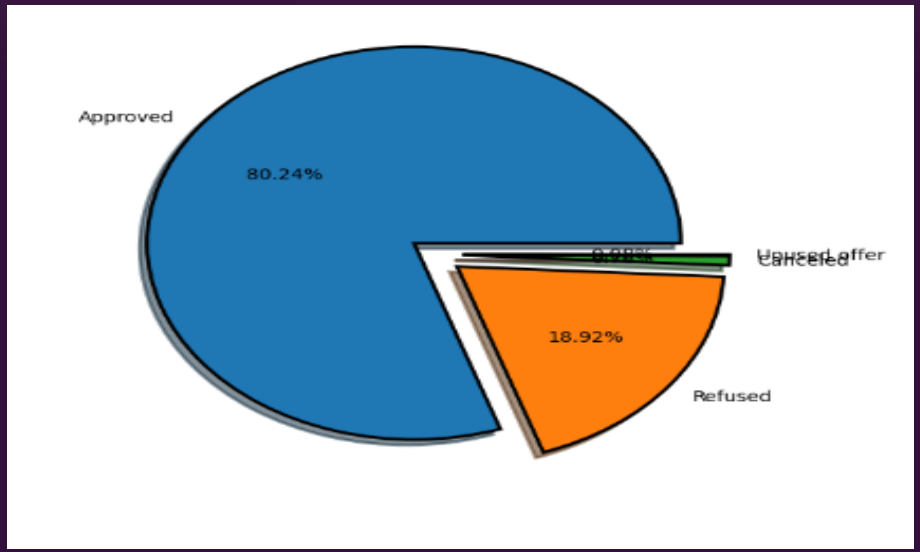




Application status on previous data

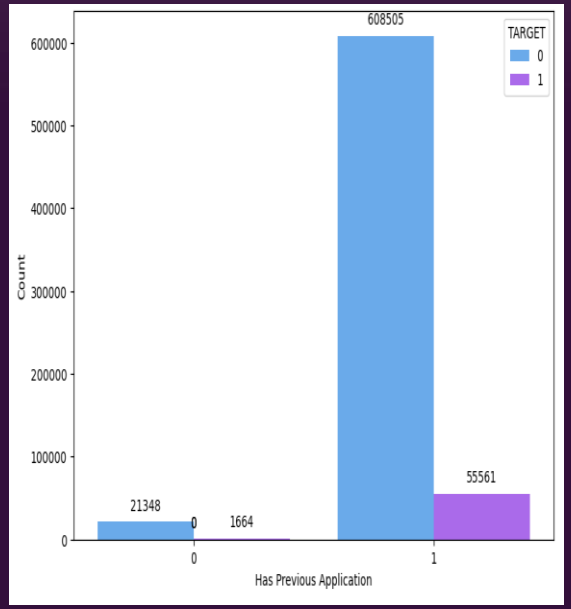
- AS PER THE PREVIOUS DATA , APPLICATION STATUS HAS AN IMPACTFUL OCCURRENCE IN TERMS OF PROVIDING CREDIT TO THE CLIENT.

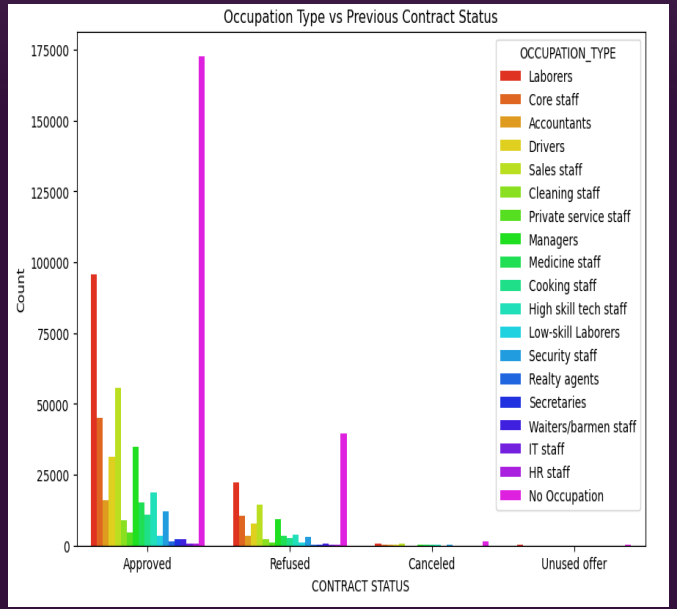


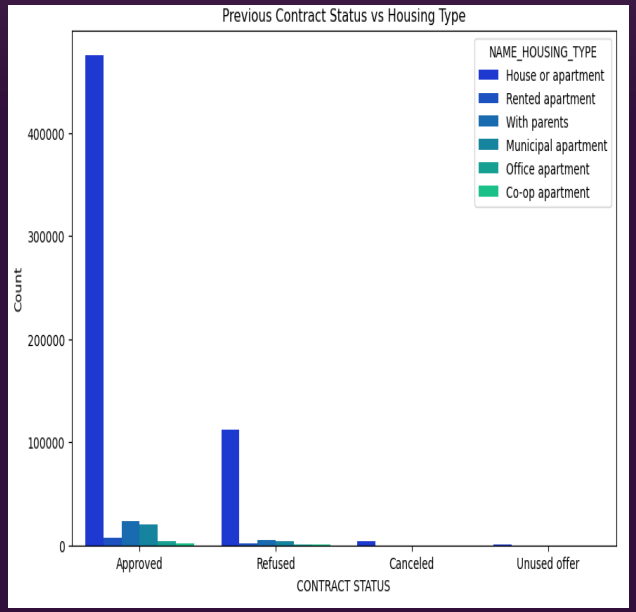


Relationship between two data Set

- THE 1ST PLOT SHOWS THAT THE CLIENT WHO ARE PREVIOUSLY ALSO APPLIED FOR THE LOAN AND THEY CONSIDERED AS THE DEFAULTERS & NON DEFAULTERS.
- 2ND PLOT SHOWCASE THAT ACCORDING TO THE OCCUPATION OF THE CLIENT , PREVIOUSLY THOSE CLIENT HAS BEEN CONSIDERED .
- 3RD PLOT INDICATE THE HOUSING TYPE ACCORDING TO THE PREVIOUS DATA .

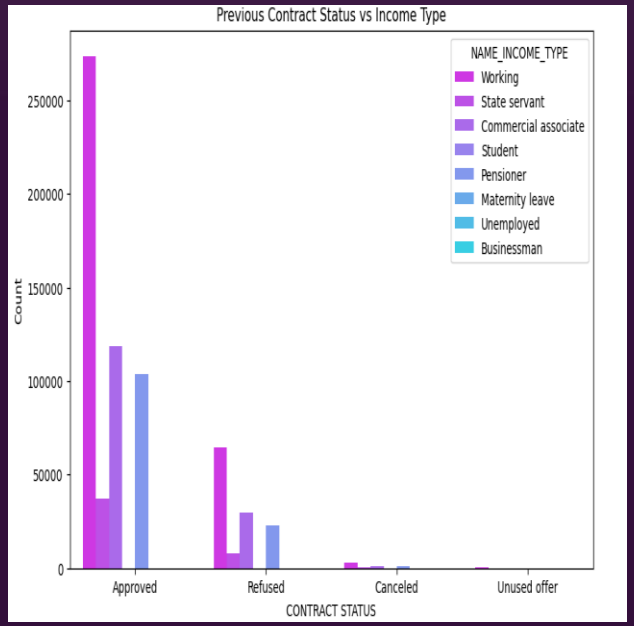


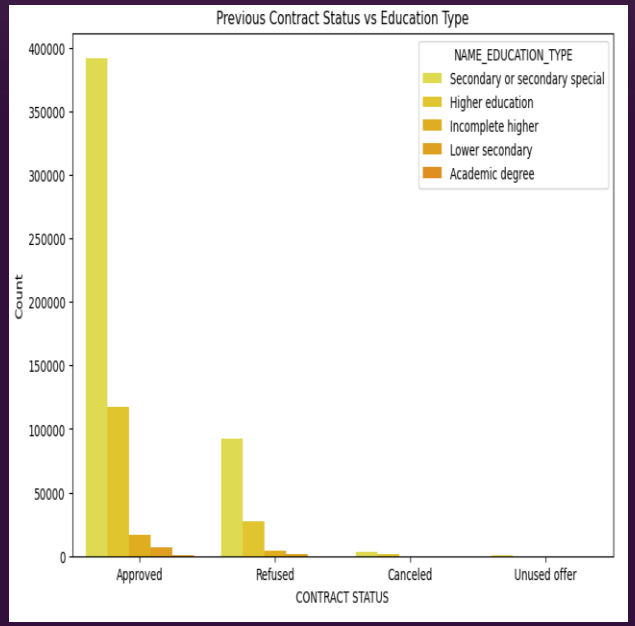


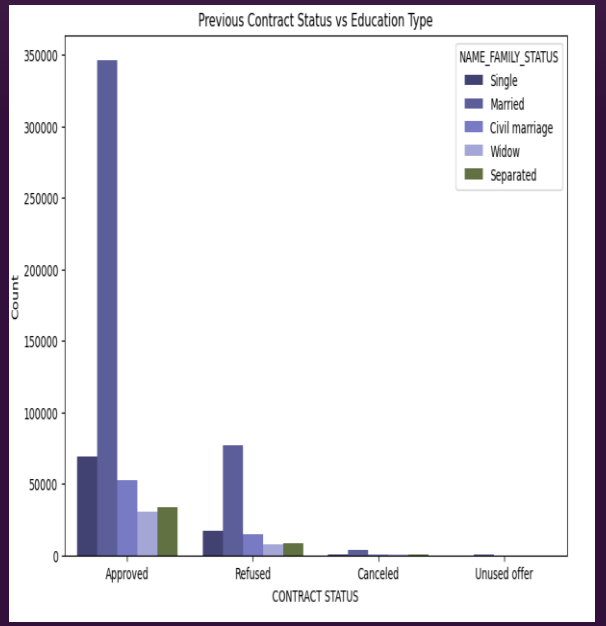


Relationship between two data Set

- ACCORDING THE 1ST PLOT INDICATE THE INCOME TYPE IN RESPECT TO CONTRACT STATUS.
- IN THE 2ND PLOT ,EDUCATION TYPE SHOWCASE WITH CONTRACT STATUS.
- LAST PLOT SHOWS THE MARITAL STATUS OF A CLIENT IN TERMS OF CONTRACT STATUS.







Descriptive Statistic

- ACCORDING TO THE PREVIOUS APPLICATION DATA,
- HIGHEST APPLICATION AMOUNT IS 40LAKHS 50 THOUSANDS & MINIMUM IS 5 THOUSANDS 4 HUNDREDS.
- MAXIMUM AMOUNT CREDIT TO THEIR ACCOUNT IS 41LAKHS 4 THOUSANDS & MINIMUM IS 5 THOUSANDS.
- 4 LAKHS 18 THOUSANDS IS THE HIGHEST ANNUITY AMOUNT & THE LOWEST ANNUITY AMOUNT IS 5 HUNDREDS.
- THE MAXIMUM PRICE OF THE GOOD S IS 40LAKHS 50 THOUSANDS & MINIMUM IS 5 THOUSANDS 4HUNDREDS.

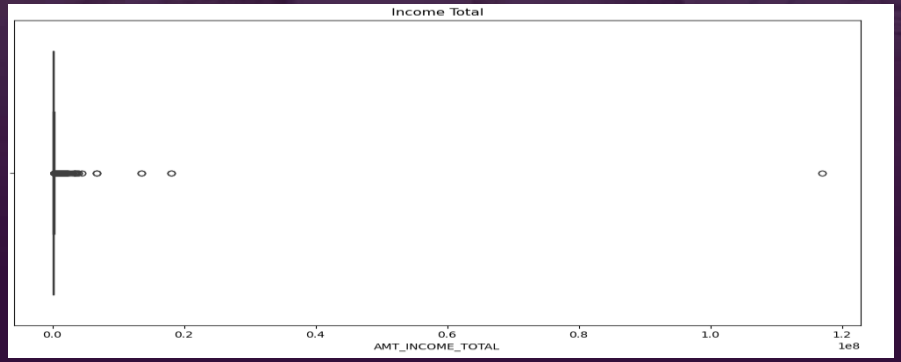
- ACCORDING TO THE APPLICATION DATA,
- HIGHEST INCOME OF CLIENT IS 11CORERS 70 LAKHS & MINIMUM INCOME IS 25 THOUSANDS SIX FIFTY.
- MAXIMUM AMOUNT CREDIT TO THEIR ACCOUNT IS 40LAKHS 50 THOUSANDS & MINIMUM IS 45 THOUSANDS.
- 2 LAKHS 30 THOUSANDS IS THE HIGHEST ANNUITY AMOUNT & THE LOWEST ANNUITY AMOUNT IS 16 HUNDREDS.
- THE MAXIMUM PRICE OF THE GOOD S IS 40LAKHS 50 THOUSANDS & MINIMUM IS 45 THOUSANDS.

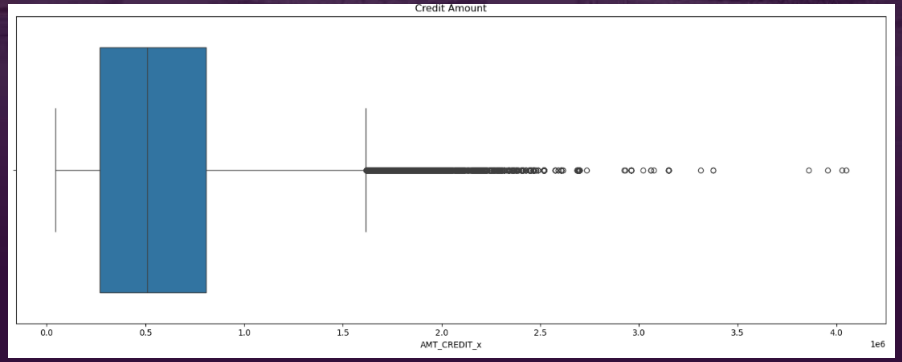
	count	mean	std	min	25%	50%	75%	max
SK_ID_PREV	664066.0	1.913498e+06	534504.543534	1000001.0	1445451.5	1910115.5	2377385.5	2845379.0
SK_ID_CURR	664066.0	2.785958e+05	102834.116102	100002.0	189517.0	279184.0	367692.0	456255.0
AMT_ANNUITY	664066.0	1.592362e+04	14849.862994	580.0	6259.0	11250.0	20336.0	418058.0
AMT_APPLICATION	664066.0	2.307181e+05	317652.951457	5400.0	51795.0	112500.0	238500.0	4050000.0
AMT_CREDIT	664066.0	2.467526e+05	346078.426893	5139.0	50513.0	113571.0	269550.0	4104351.0
AMT_DOWN_PAYMENT	664066.0	4.197126e+03	16352.899508	-1.0	0.0	0.0	3938.0	2150100.0
AMT_GOODS_PRICE	664066.0	2.307421e+05	317669.742068	5400.0	51795.0	112500.0	238500.0	4050000.0

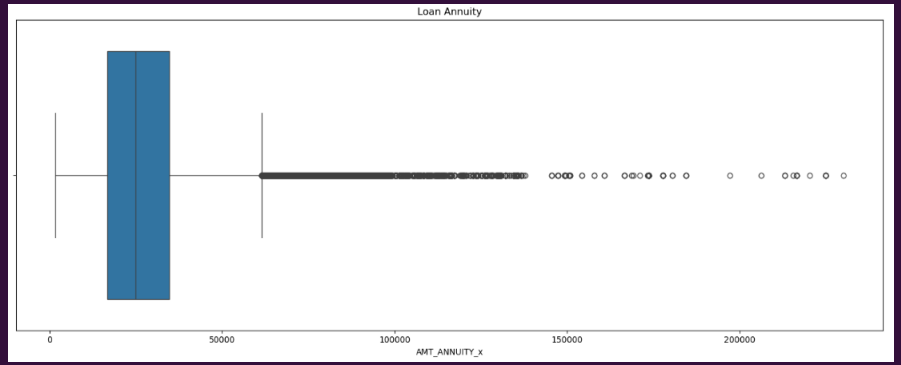
	count	mean	std	min	25%	50%	75%	max
SK_ID_CURR	276480.0	278230.126595	102810.910324	100002.0	189221.75	278337.5	367214.25	456255.0
TARGET	276480.0	0.080704	0.272380	0.0	0.00	0.0	0.00	1.0
AMT_INCOME_TOTAL	276480.0	167312.715299	245504.884956	25650.0	112500.00	144000.0	202500.00	117000000.0
AMT_CREDIT	276480.0	592378.761549	393803.008467	45000.0	270000.00	509400.0	808650.00	4050000.0
AMT_ANNUITY	276480.0	26970.109776	14189.280097	1616.0	16551.00	24836.0	34511.00	230162.0
AMT_GOODS_PRICE	276480.0	532049.647819	360646.454244	40500.0	238500.00	450000.0	679500.00	4050000.0

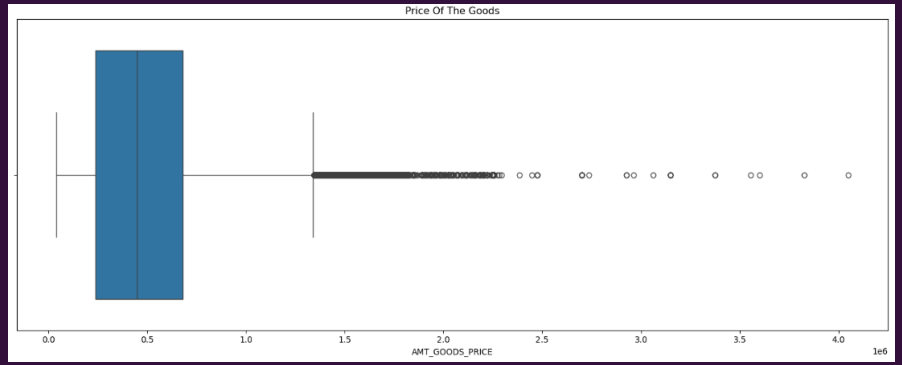
Outlier Detection

- AS PER THE DATA POINT WE CAN OBSERVE THAT ALL FEATURES HAS THE OUTLIERS.



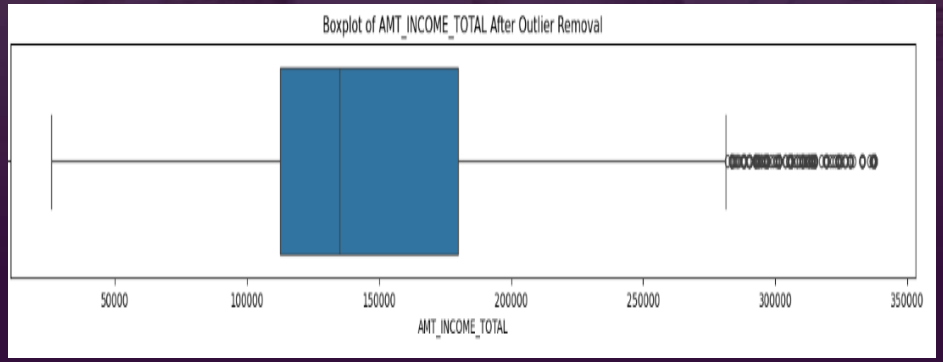


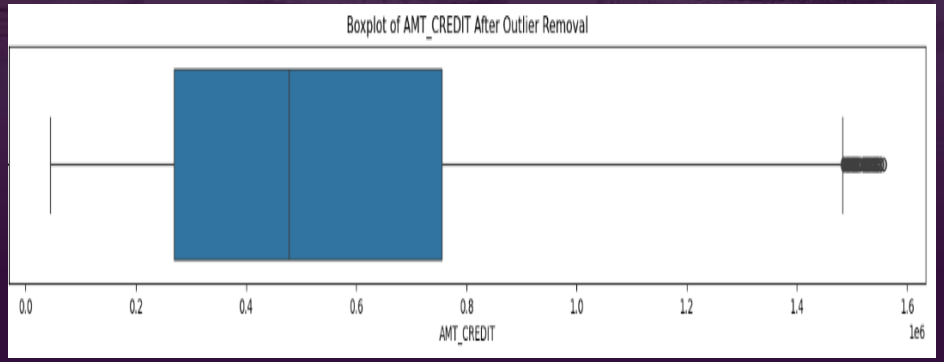


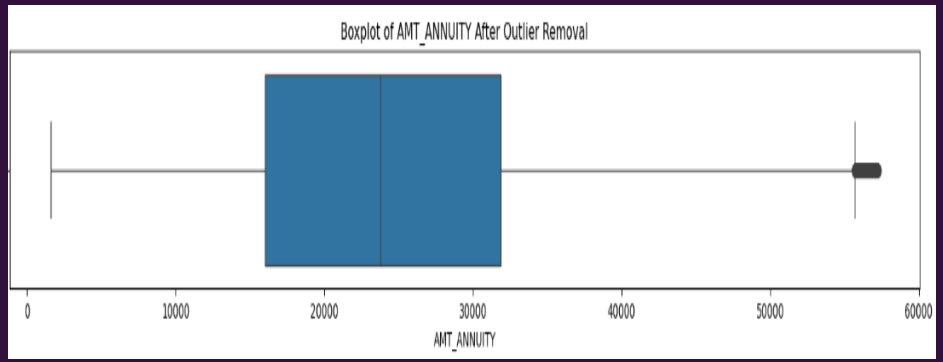


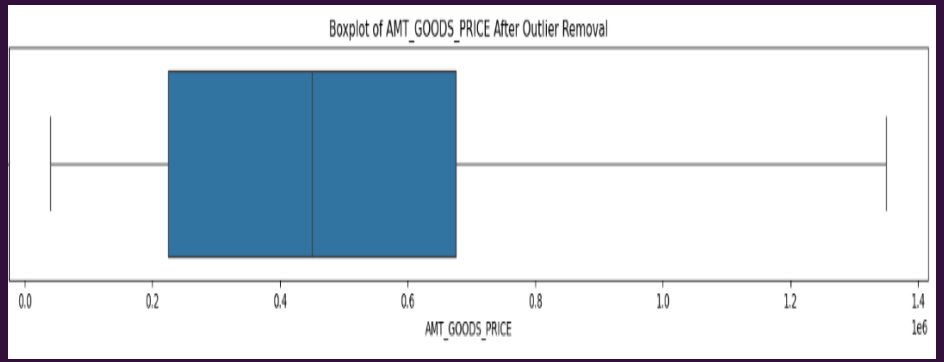
After removal of Outlier

- AFTER USING IQR METHOD WE CAN SEE THERE WAS REDUCTION IN THE OUTLIERS

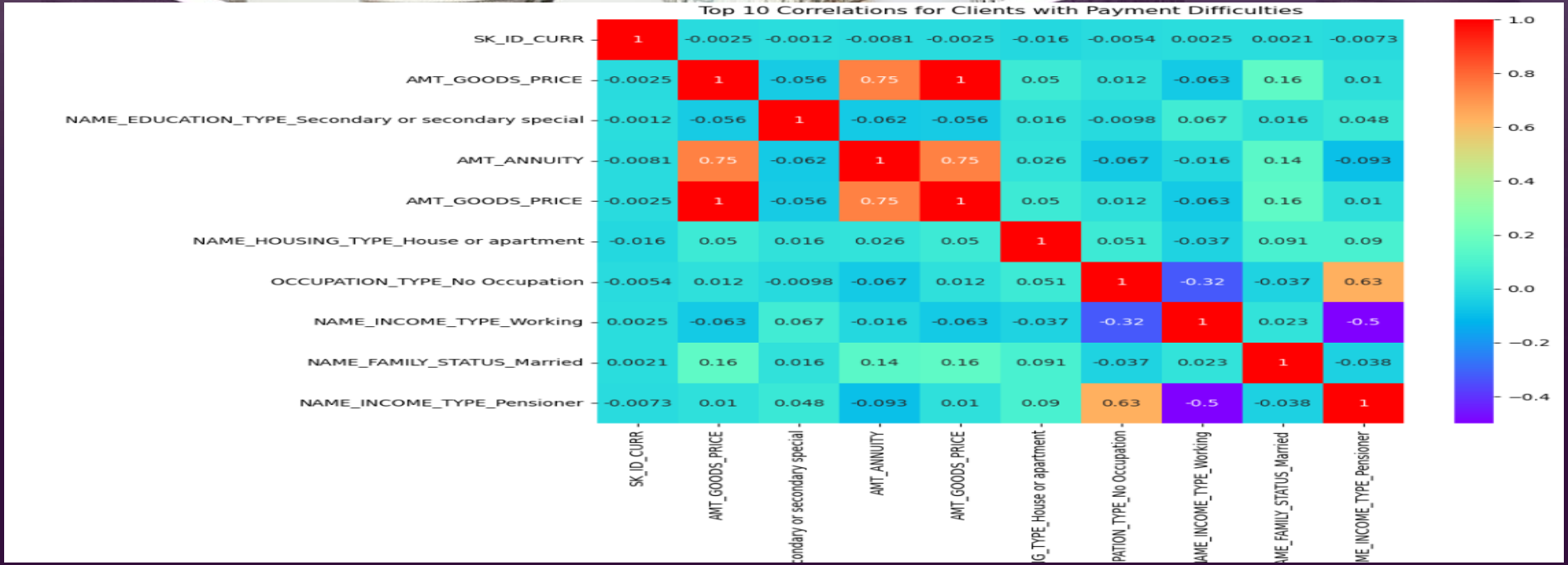








Correlation for Client



- *THERE WAS A POSITIVE CORRELATION BETWEEN*
  - *GOODS PRICE & ANNUITY*
  - *OCCUPATION & INCOME TYPE(PENSIONER)*
- *THERE WAS A NEGATIVE CORRELATION AS WELL*
  - *EDUCATION & ANNUITY*
  - *EDUCATION & GOODS PRICE*

Correlation for Client

- THERE WAS A POSITIVE CORRELATION BETWEEN
  - GOODS PRICE & CREDIT AMOUNT
  - GOODS PRICE & EDUCATION
- THERE WAS A NEGATIVE CORRELATION AS WELL
  - HOUSING TYPE (HOUSE OR APARTMENT & MUNICIPAL APARTMENT)
  - INCOME TYPE (WORKING & PENSIONER)

Correlation on Merge data

- THERE WAS A POSITIVE CORRELATION BETWEEN
  - GOODS PRICE & CREDIT AMOUNT
  - CREDIT AMOUNT & ANNUITY AMOUNT
  - GOODS PRICE & ANNUITY AMOUNT

Dashboard on Previous data

Dashboard 2: Previous Applications Data

For the **Previous Applications Data** dashboard, focus on these relationships:

1. Loan Application Status Analysis:
   - **NAME_CONTRACT_STATUS vs. NAME_CONTRACT_TYPE**: Visualize approval and refusal rates based on contract type.
   - **NAME_CONTRACT_STATUS vs. AMT_CREDIT**: Compare average credit amounts for approved vs. refused loans.
   - **SK_ID_CURR vs. NAME_CONTRACT_STATUS**: Track the status of previous applications for each applicant.
2. Financial Metrics Analysis:
   - **AMT_ANNUITY vs. AMT_APPLICATION**: Explore the relationship between the amount applied for and the annuity of the loan.
   - **AMT_DOWN_PAYMENT vs. AMT_GOODS_PRICE**: Correlate down payments with the price of goods.
   - **AMT_CREDIT vs. AMT_DOWN_PAYMENT**: Analyze how the down payment relates to the total credit amount.
3. Contract and Application Details:
   - **NAME_CONTRACT_TYPE vs. AMT_CREDIT**: Compare credit amounts across different types of contracts.
   - **NAME_CONTRACT_TYPE vs. AMT_APPLICATION**: Show requested loan amounts by contract type.
   - **SK_ID_PREV vs. NAME_CONTRACT_STATUS**: Review the outcomes of previous loan applications.

Dashboard on Application data

Dashboard 1: Application Data

1. Loan Default Analysis:
   - TARGET vs. NAME_CONTRACT_TYPE: Explore default rates by loan type.
   - TARGET vs. AMT_CREDIT: Compare credit amounts between defaulters and non-defaulters.
   - TARGET vs. CODE_GENDER: Analyze default rates by gender.
2. Income and Loan Relationships:
   - AMT_INCOME_TOTAL vs. AMT_CREDIT: Examine the relationship between income and loan amounts.
   - NAME_INCOME_TYPE vs. AMT_INCOME_TOTAL: Compare income levels across different income types.
   - AMT_CREDIT vs. AMT_GOODS_PRICE: Correlate loan amounts with the price of goods.
3. Demographic Insights:
   - NAME_EDUCATION_TYPE vs. AMT_INCOME_TOTAL: Analyze income based on education levels.
   - NAME_FAMILY_STATUS vs. AMT_CREDIT: Compare loan amounts by family status.
   - NAME_HOUSING_TYPE vs. AMT_ANNUITY: Explore the impact of housing type on annuity payments.
4. Occupation-Based Analysis:
   - OCCUPATION_TYPE vs. AMT_INCOME_TOTAL: Compare income levels across different occupations.
   - OCCUPATION_TYPE vs. TARGET: Investigate default rates by occupation type.

•Thank you

TO

ALL THE TEAM MEMBERS