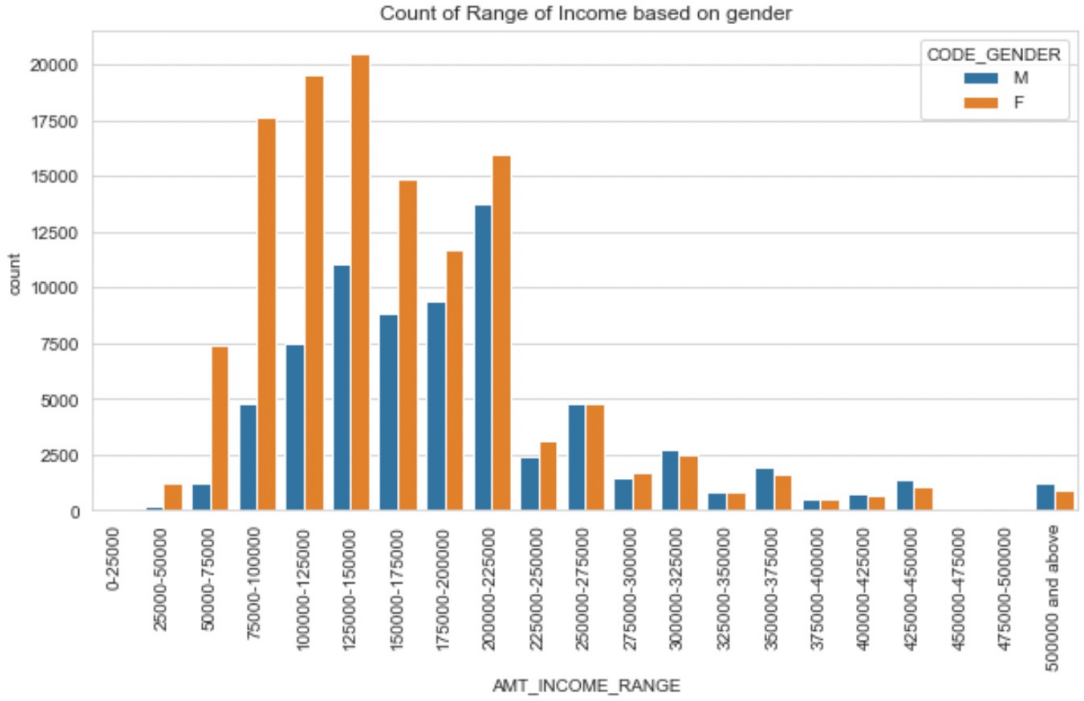
CREDIT EDA CASE STUDY.

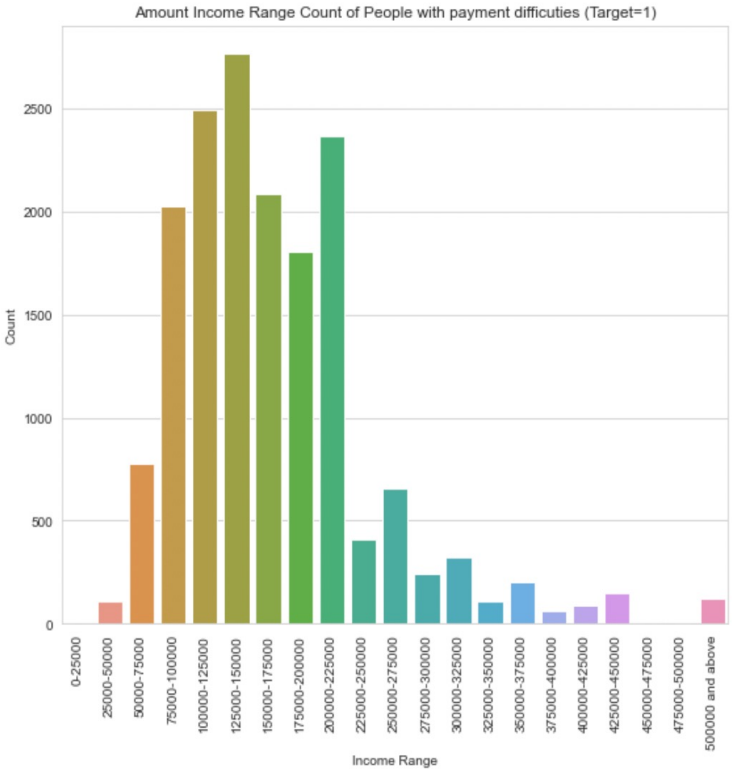
- By Ameya Shukla

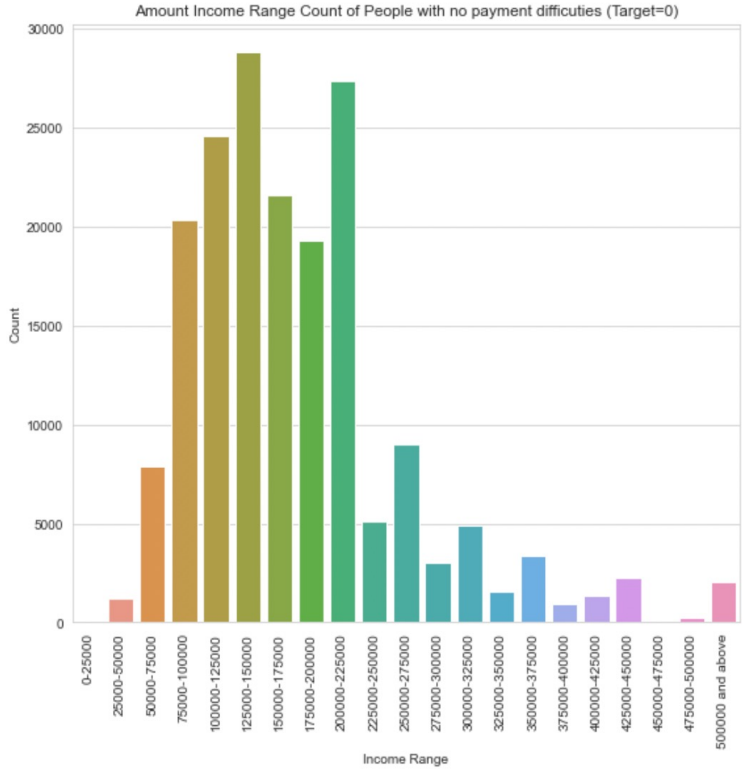
Univariate Analysis on New Application



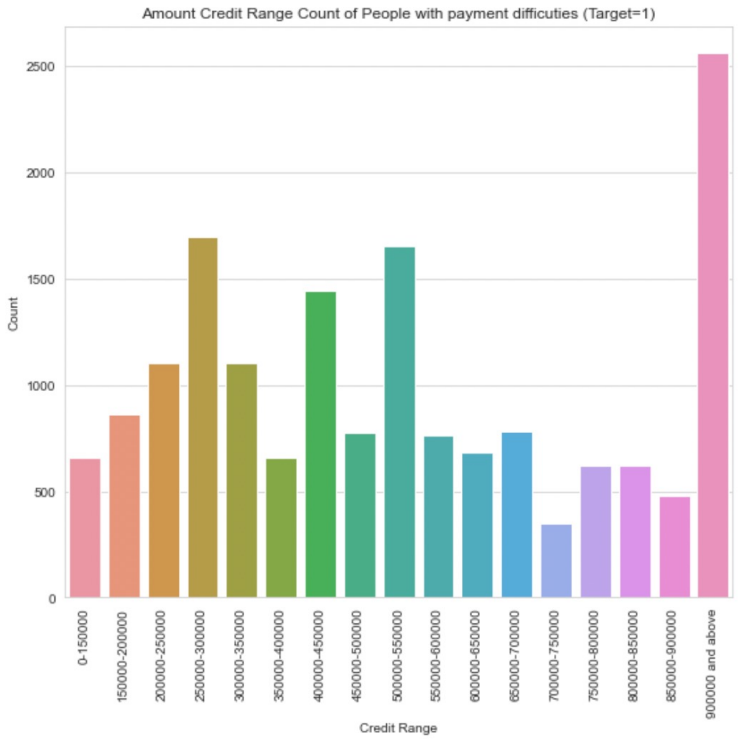
- In the previous histplot we saw the count of Income of both the Gender, and here we have it in `Income-Range`, If we see the above countplot, Females have more number of count as compare to Males from the range `25000-225000`.

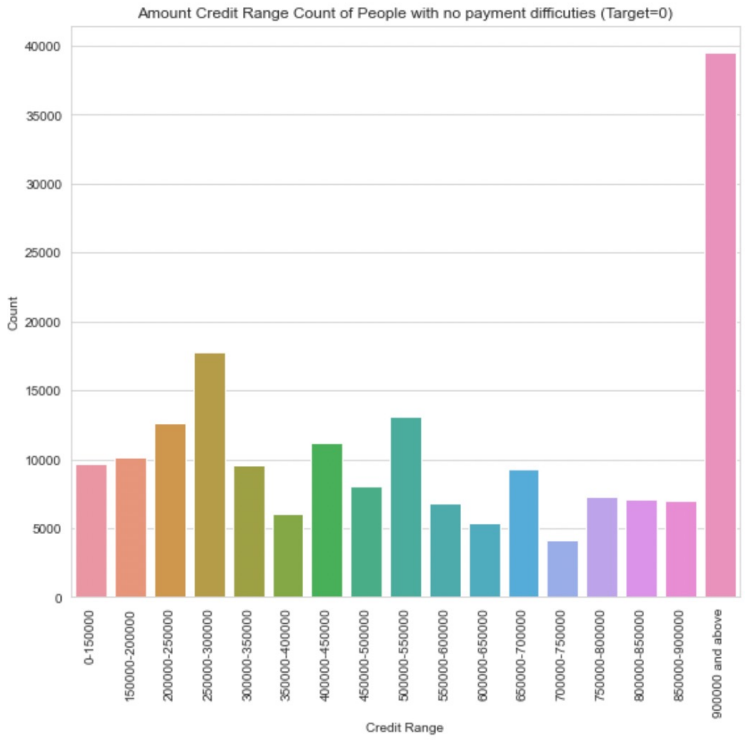
- After `225000` we can see the number of count of Males and Females are decreasing.





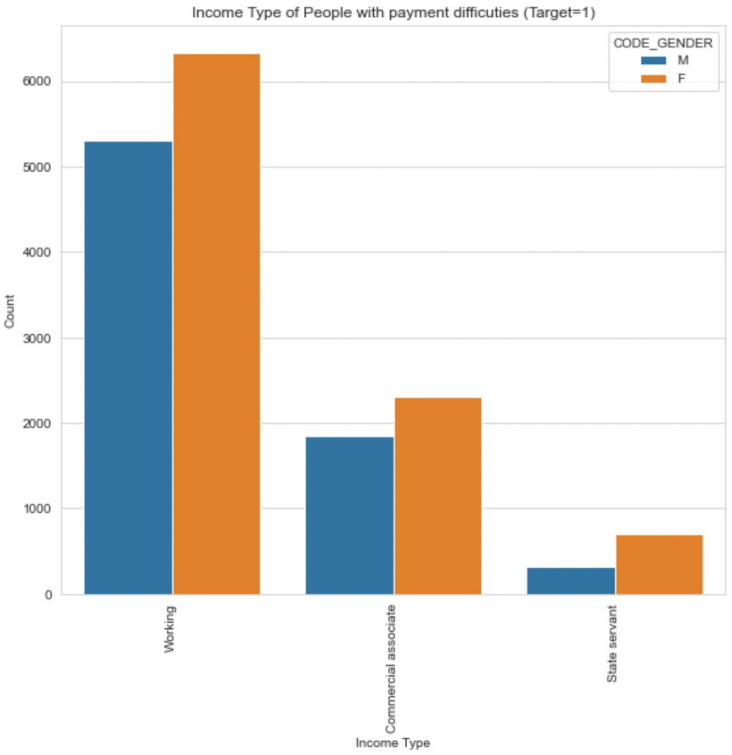
- If we see the Income-Range count with respect to `target0` and `target1`, it is almost similar.
- `125000-150000` is the range with the highest count of values in both `target0` and `target1`

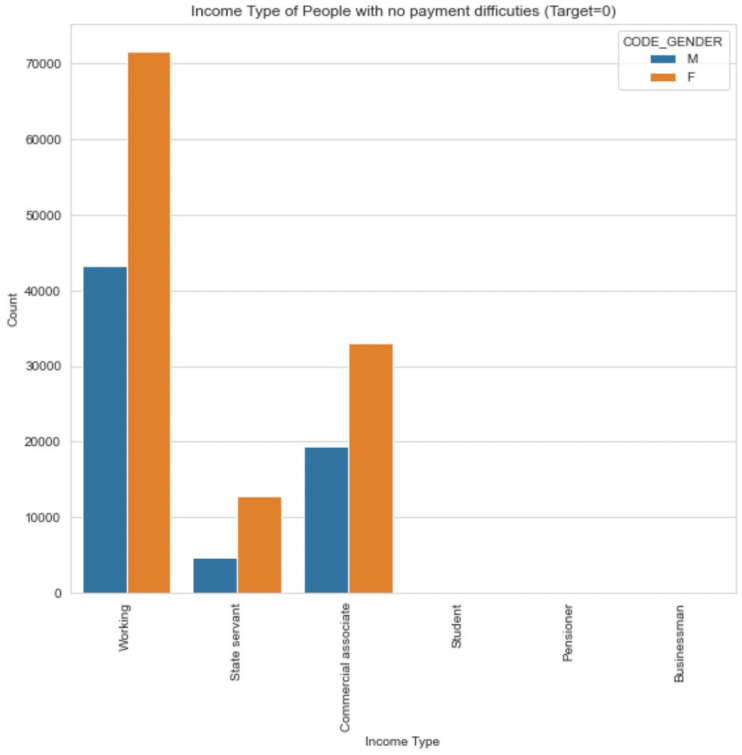




- If we see the Loan Amount Credit-Range `target0` have higher number of amount credit from `200000-550000` and `target1` have lesser number of amount credit in the same range, it means both the targets have maximum number of requirement of loan in this range.

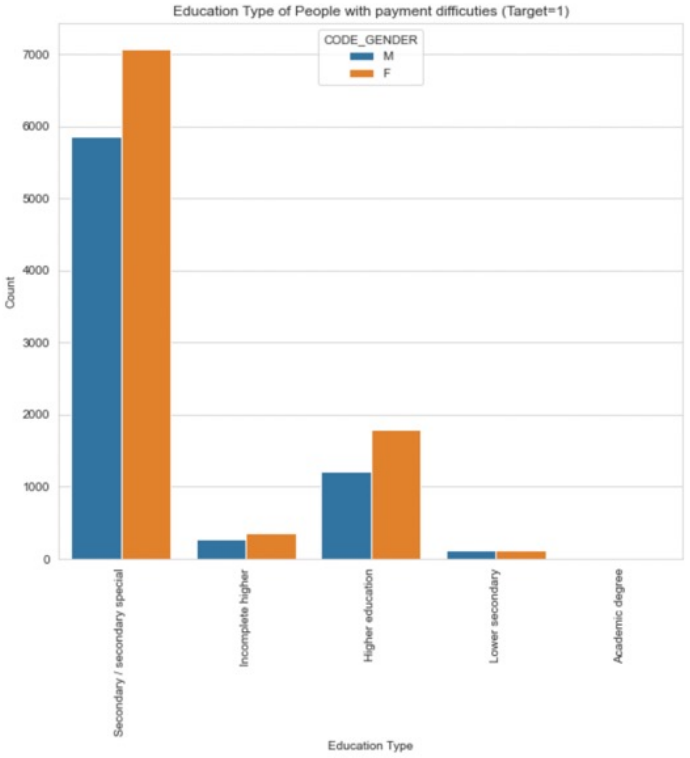
- Loan Amount Credit-Range of `900000 and above` people shows highest number of requirement in their respective targets.

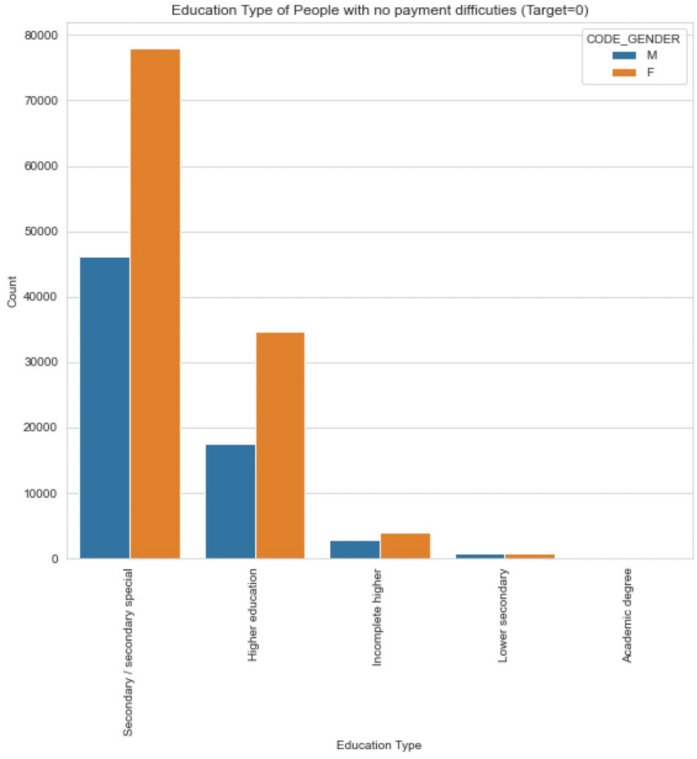




- The `Student`, `Pensioner` and `Businessman` are present in the income type of `target0` but they are absent in `target1`.

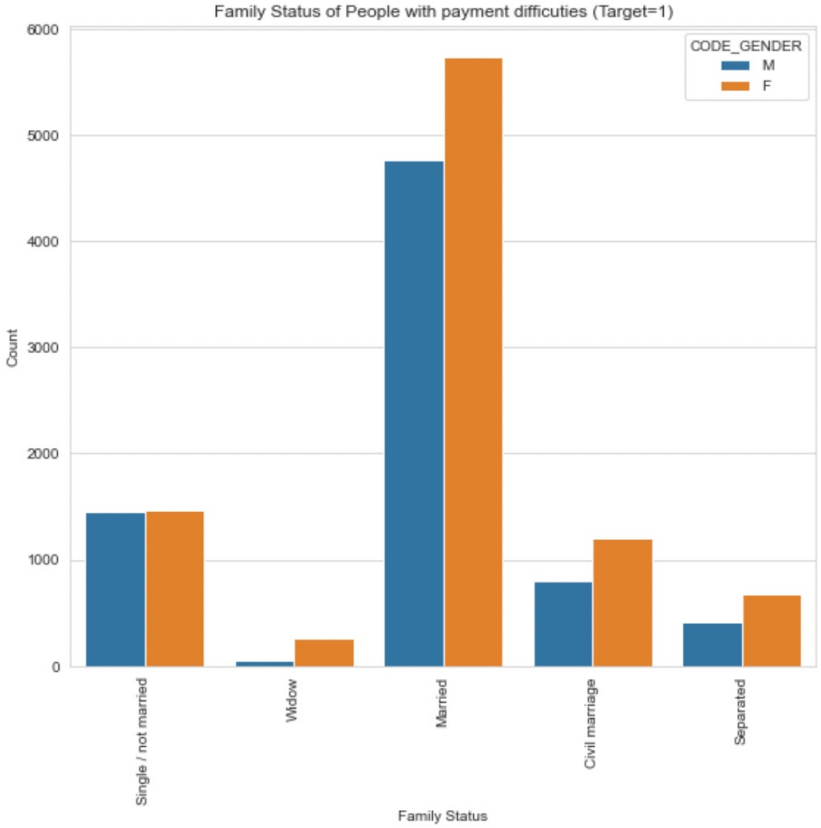
- The number of Females is high as compared to Males in the income type of `Working, State Servant, and Commercial Associate` irrespective of the targets.

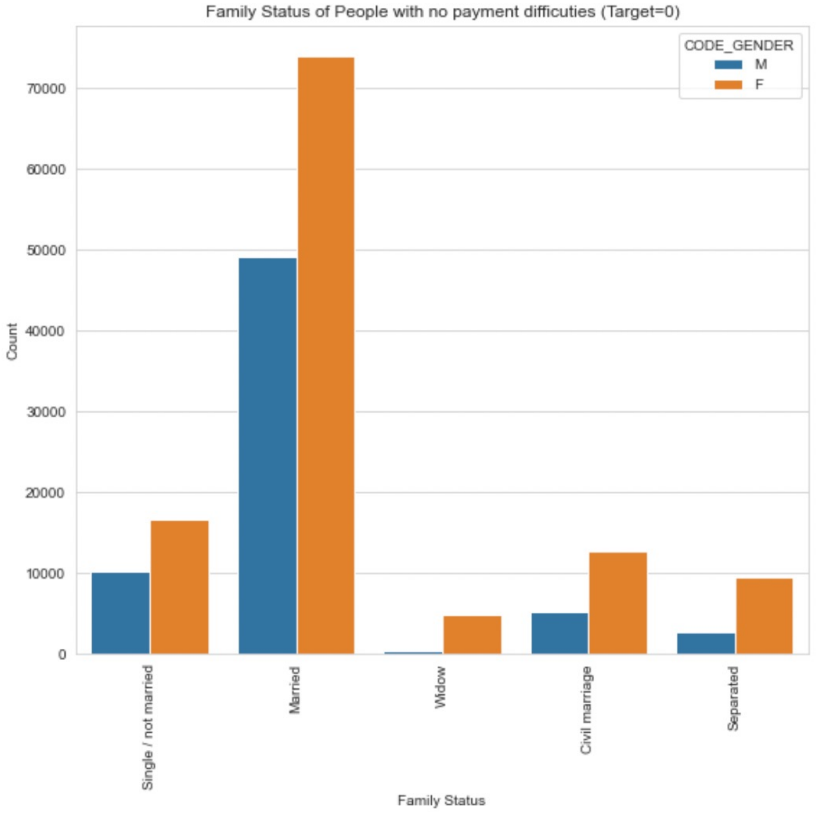

Education Type of People with payment difficulties (Target=1)
CODE_GENDER
M
F
Count
0
1000
2000
3000
4000
5000
6000
7000
Secondary / secondary special
Incomplete higher
Higher education
Lower secondary
Academic degree
Education Type


Education Type of People with no payment difficulties (Target=0)
CODE_GENDER
M
F
Count
0
10000
20000
30000
40000
50000
60000
70000
80000
Secondary / secondary special
Higher education
Incomplete higher
Lower secondary
Academic degree
Education Type

- In both the `target0` and `target1` we have the highest number of application from Secondary Special and lowest number of application from Academic Degrees.
- Distribution of `Females` in both the `target0` and `target1` is high in all types of Education.

- In `target0` we can see the distribution of Males are decreased as compared to Females in all types of Education.
- In `target1` we can see the distribution of Males and Females in all types of Education have not much difference in application.


Family Status of People with payment difficuties (Target=1)
CODE_GENDER
M
F
Count
6000
5000
4000
3000
2000
1000
0
Single / not married
Widow
Married
Civil marriage
Separated
Family Status


Family Status of People with no payment difficuties (Target=0)
CODE_GENDER
M
F
Count
70000
60000
50000
40000
30000
20000
10000
0
Single / not married
Married
Widow
Civil marriage
Separated
Family Status

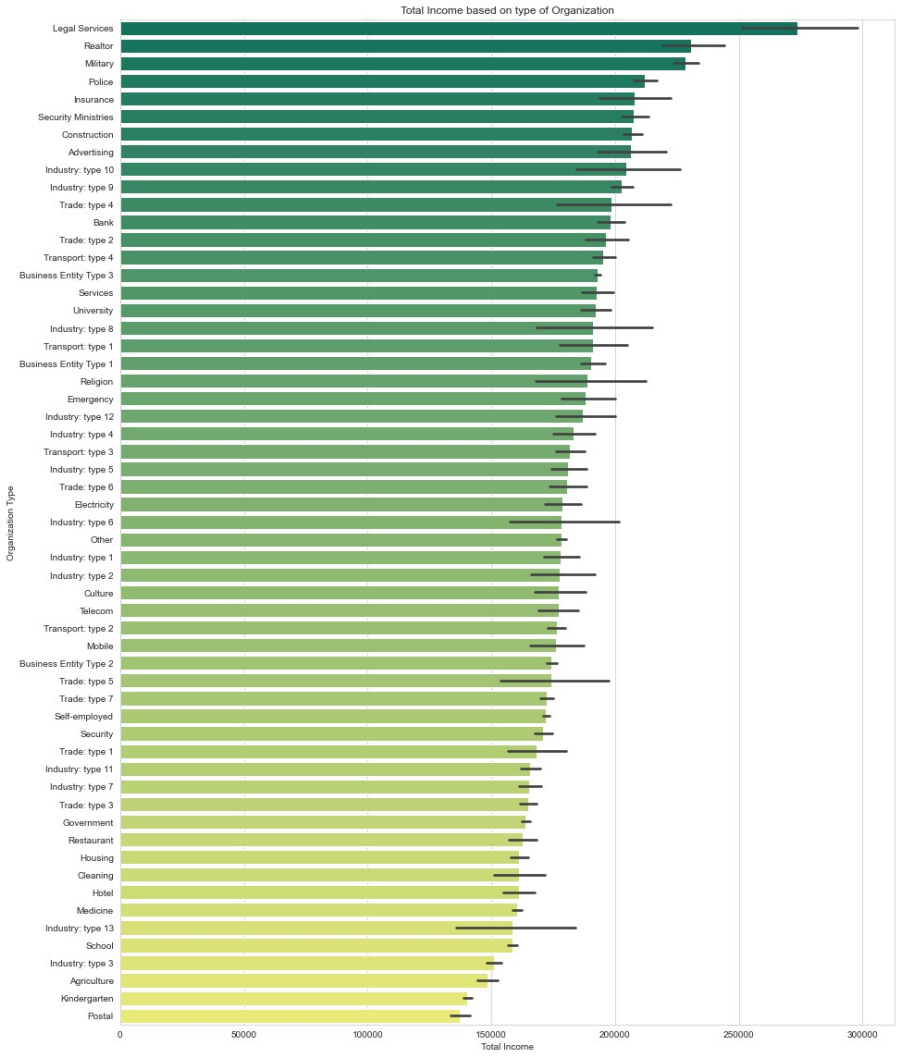
- In both the `target0` and `target1` the highest distribution are of Married peoples and the lowest distribution is of Widow's, irrespective of their gender.
- We have Females in `target1` in higher numbers as compared to Males, which means Females of all type of Family Status are more likely to default.
- - We can also see in `target0` the the distribution of Females are higher as compared to Males, so that's why the `target1` have also high distribution of Females.

Bivariate Analysis on New Application

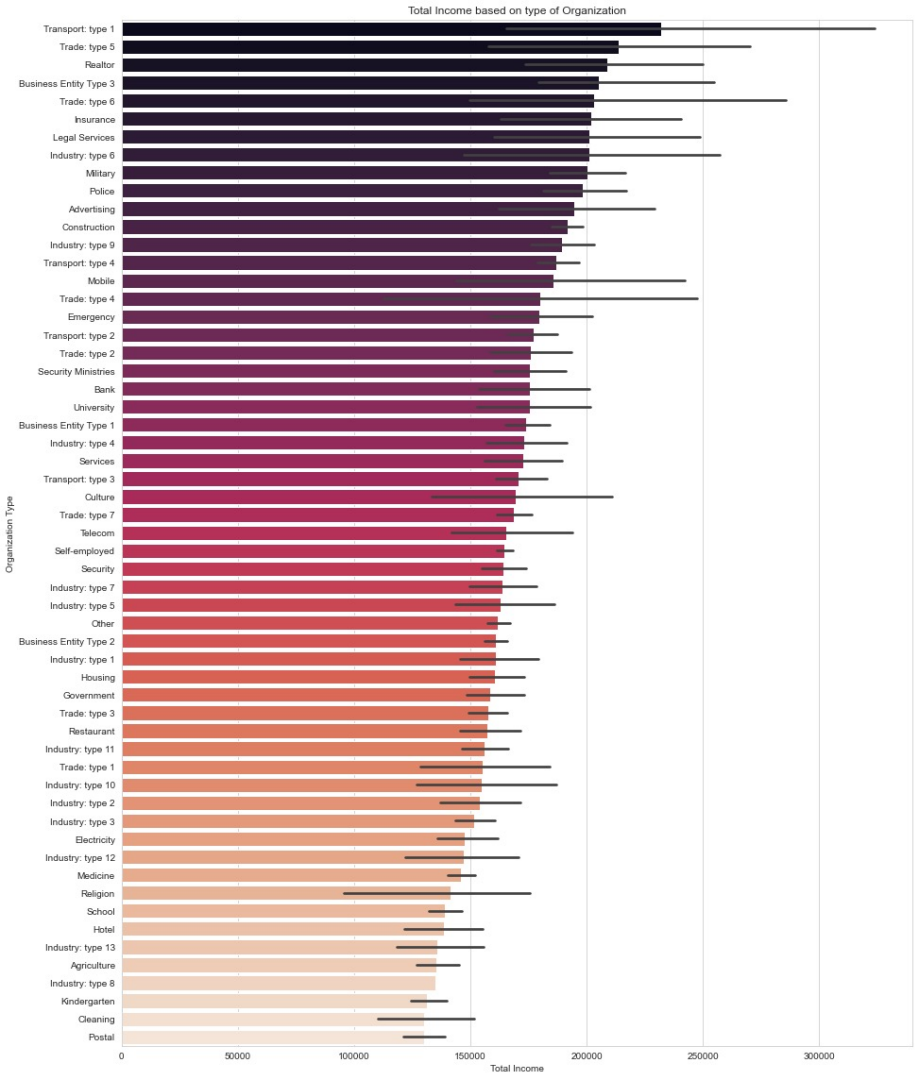
- The highest Total Income in Organization Type is of `Legal Services` at around 275000 in `target0`.

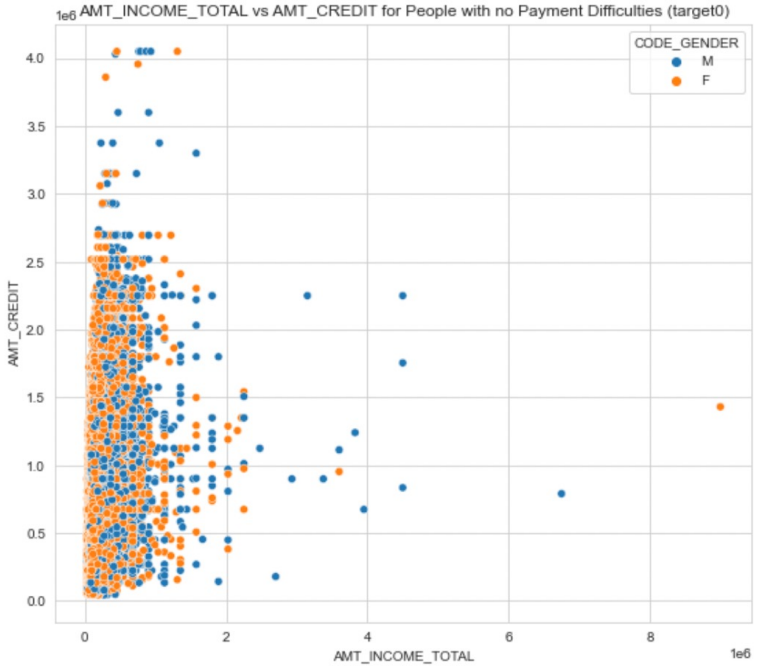
- The lowest Total Income in Organization Type is of `Postal` which is less than 150000.

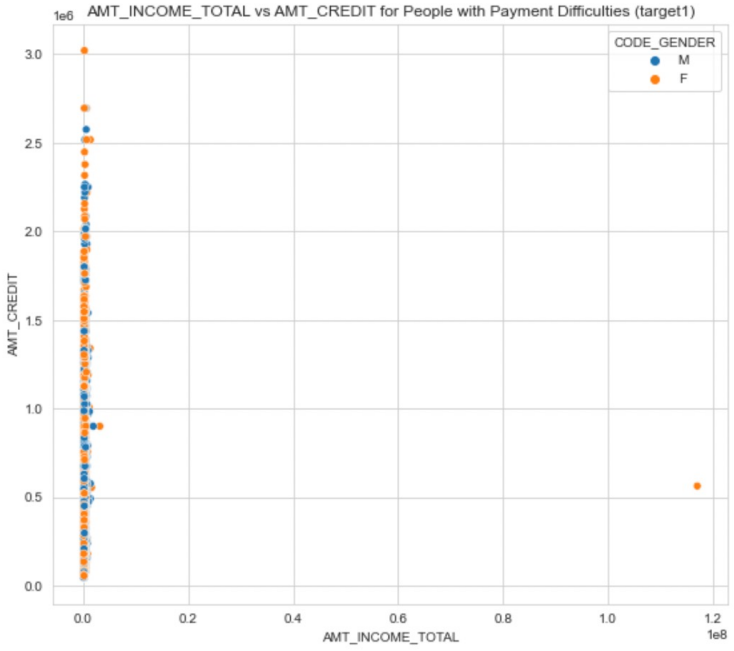
- Although we have the highest number of application from `Business Entity Type-3` but it's Total Income is lower than the `Legal Services`.



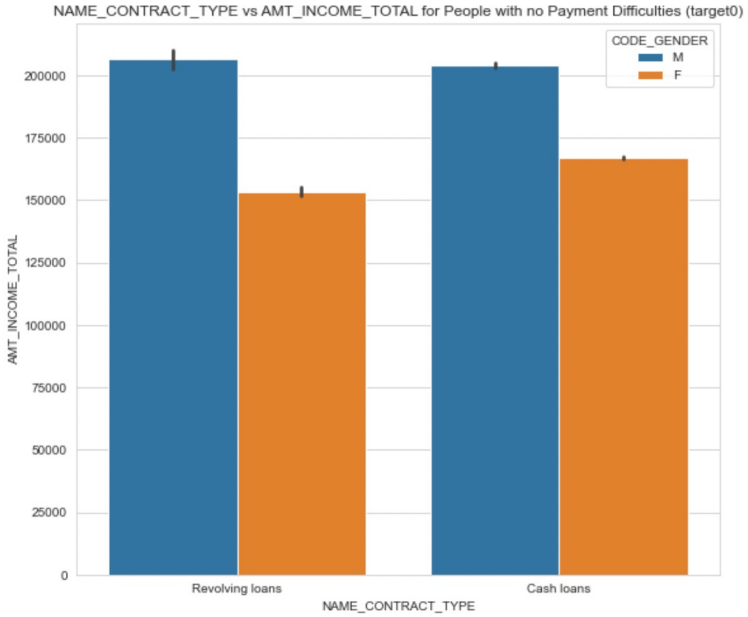
- The highest Total Income in Organization Type is of `Transport Type 1` at about 250000 in `target1`.
- The lowest Total Income in Organization Type is of `Postal and Cleaning` which is less than 150000.
- Although we have the highest number of application from `Business Entity Type-3` but it's Total Income is lower than the `Transport Type 1`.
- In target1, `Transport Type 1` has the highest total income amount, whereas in target0, `Legal Services` are leading in terms of total income. This can mean that people with payment difficulties might be majorly from `Transport Type 1` and their average total income will be higher as compared to other types of organizatons.

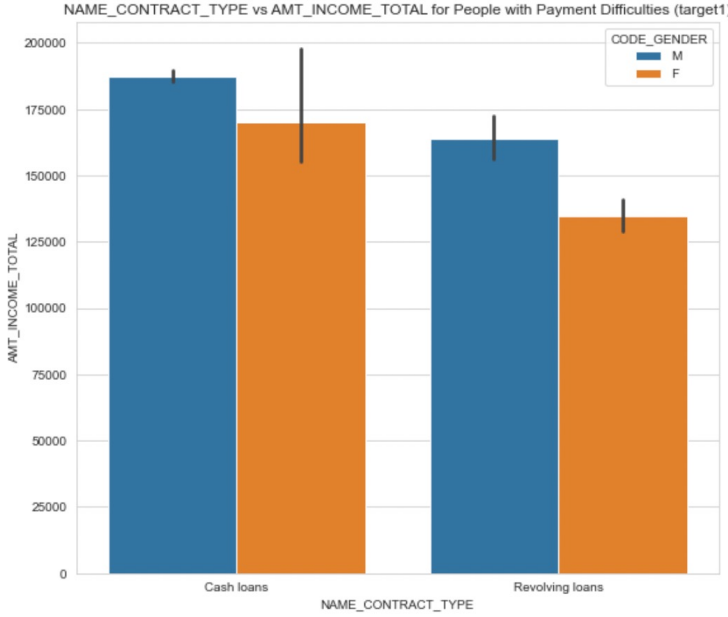




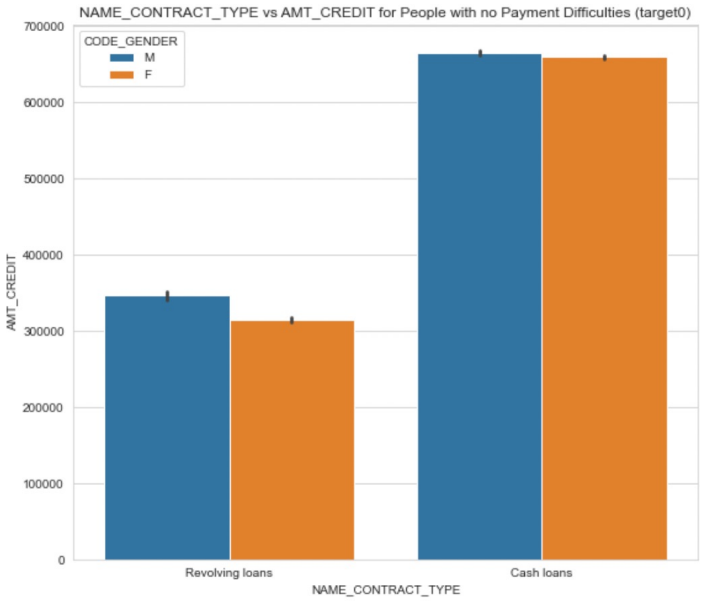


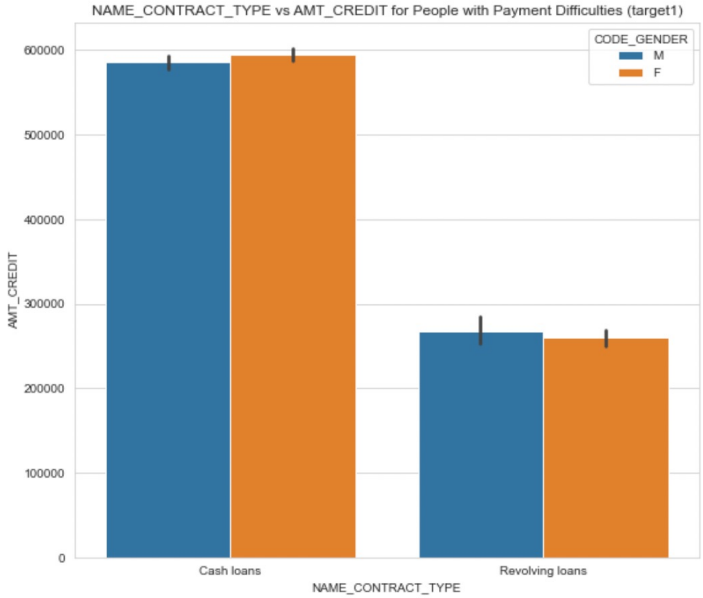
- In `target0`and `target1` higher Amount of Income does not mean higher Amount of Loan Credit.
- The `target0` have both Males and Females losely together.
- The `target1` have both Males and Females in a linear correlation with only few outliers.
- Most of the high Loan Amount Credit are provided to the low Amount of Income Total applicants.



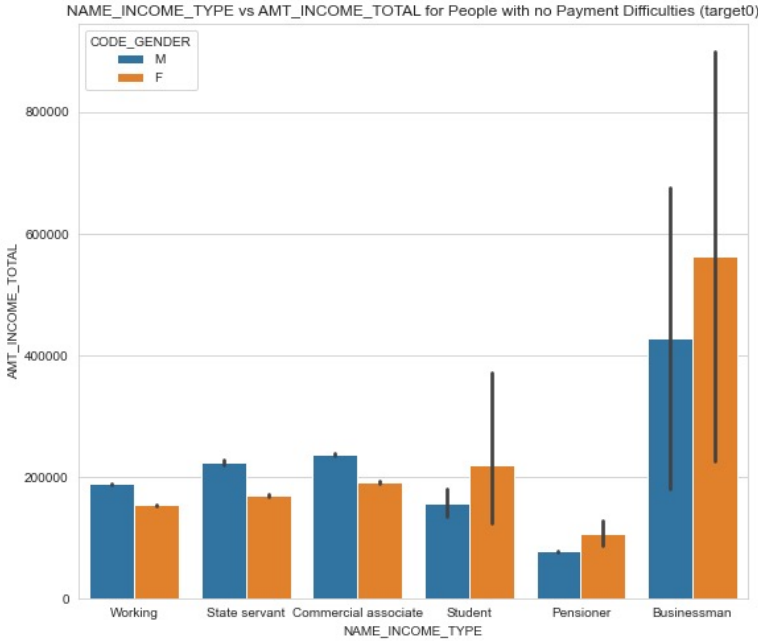


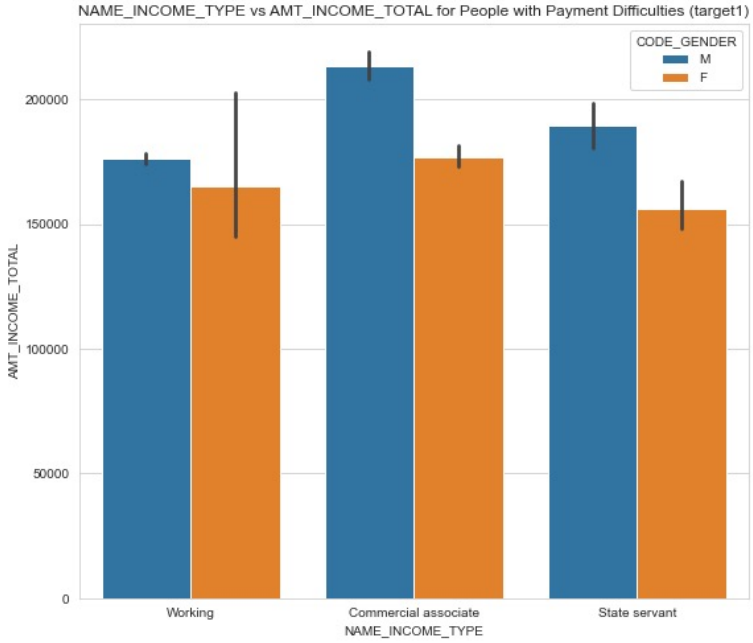
- In `target0` the Income Total of applicants is quite similar in both the `Revolving Loans and Cash Loan`, by irrespective of their gender.
- Where as in `target1` we can infer that we have lesser Income Total of applicants in `Revolving Loans` as compared to `Cash Loans, by irrespective of their gender.
- The difference between the count of values in `Revolving Loans` and `Cash Loans` is significantly higher in both the `target0` and `target1`, but their data about the total income amount is almost equal with slight differences.



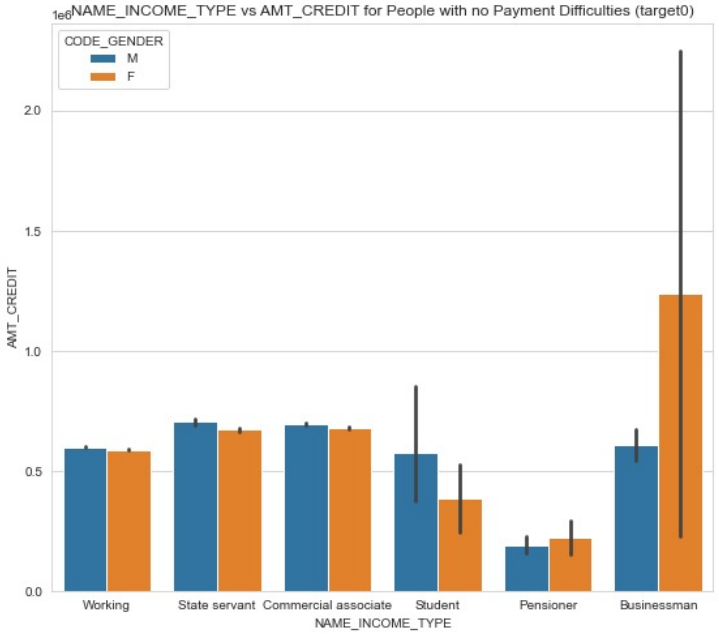


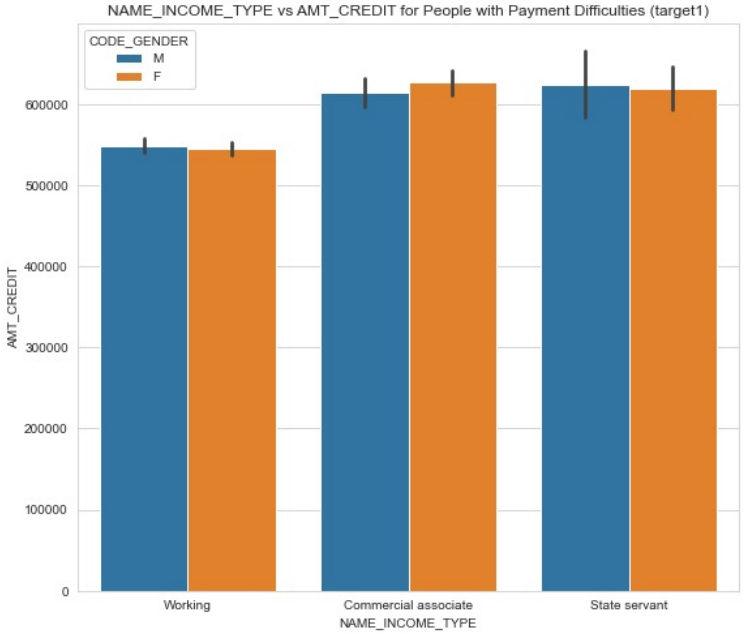
- In `target0` and `target1` the Loan Credit Amount is much higher in `Cash Loans` as compared to `Revolving Loans`, and if we compare gender of both the target, then in `target0` Males have been provided slightly more with the Cash Loan as compared to Females, whereas in `target1` it is vice-versa.



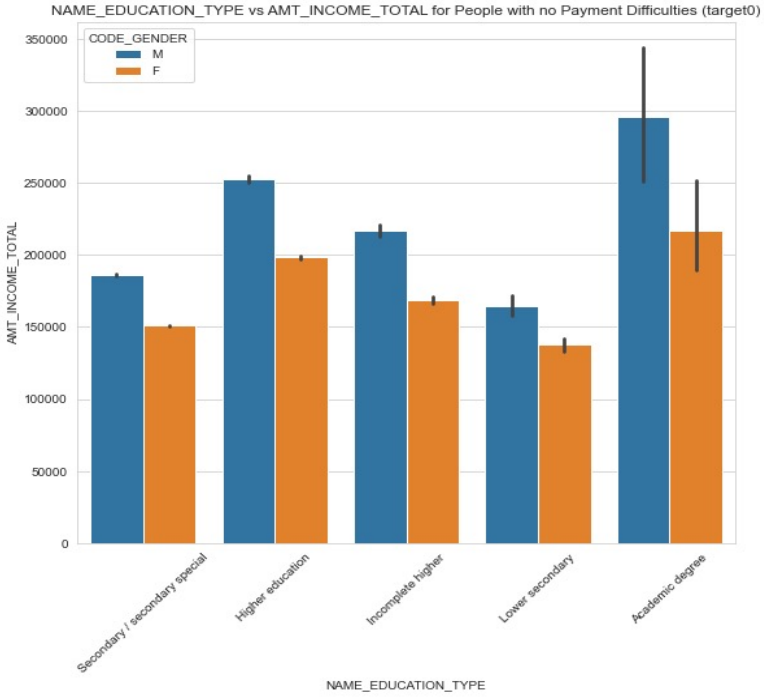


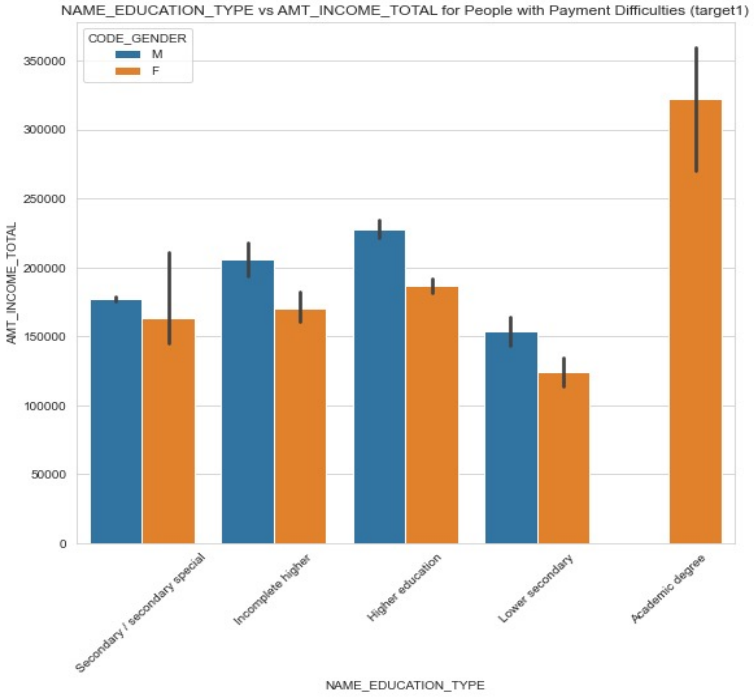
- In `target0` the Businessman Income Type have highest Amount Income, whereas this Income type is absent in `target1`.
- In `target0` the Pensioner Income Type have the lowest Amount Income, whereas this is also absent in `target1`.
- In `target1` the Commercial Associate have the highest Amount Income and Working Income Type is the lowest in Amount Income.



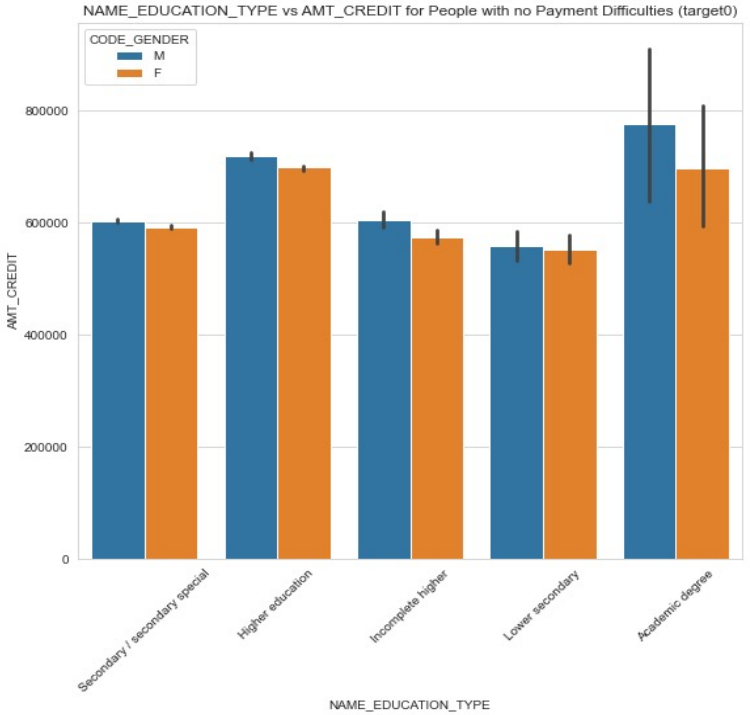


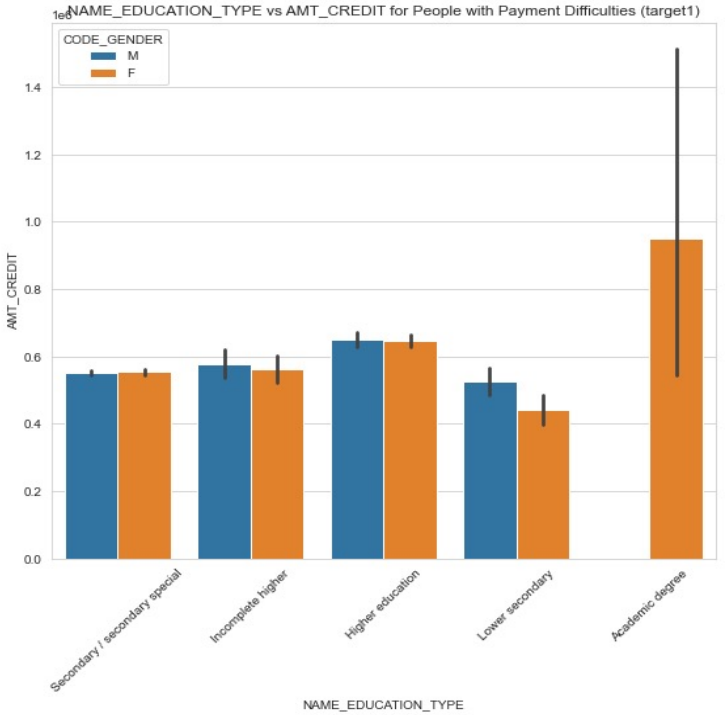
- In `target1` the Commercial Associate and State Servant are slightly equal in Loan Amount Credit which is greater than `600000`.
- In `target0` the Businessman Income Type have the highest Loan Amount Credit in Females, whereas in Males the State servant have highest Loan Amount Credit.
- In `target0` the Pensioners are the lowest in Credit Amount.



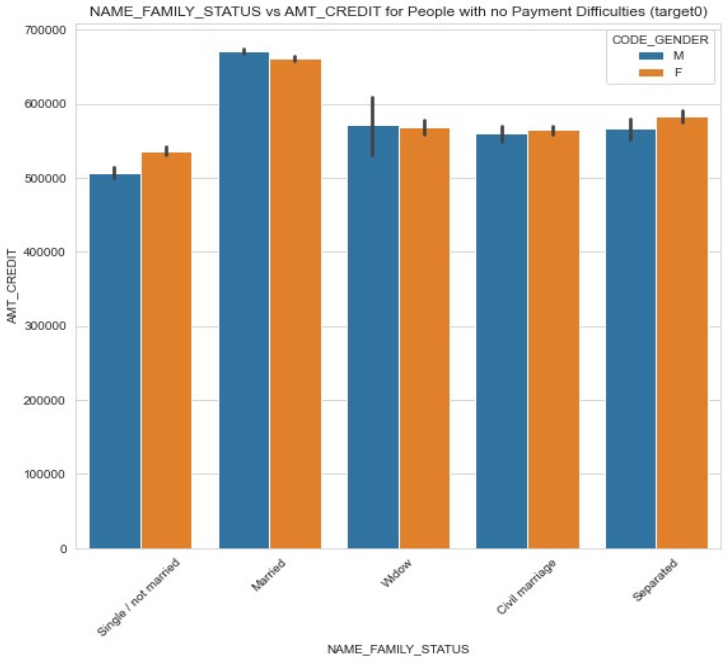


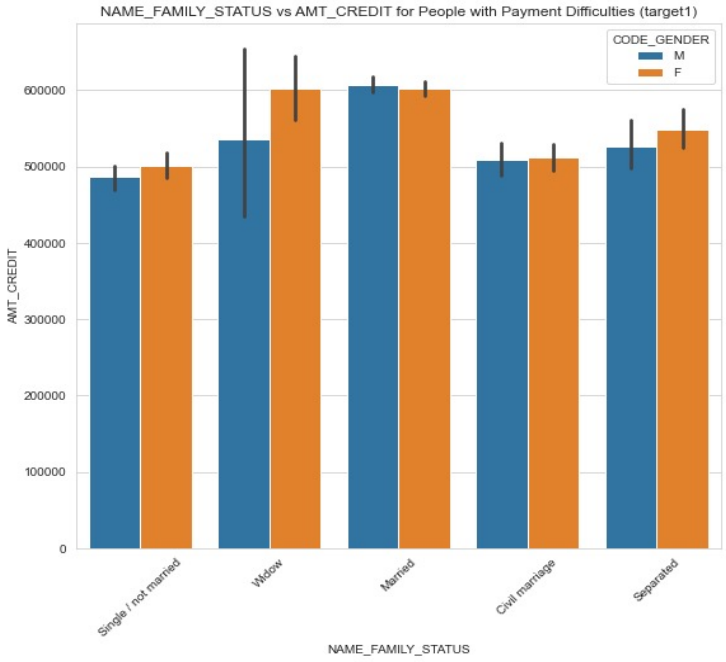
- In `target0`, the Academic Degree have the highest Amount of Income, by irrespective of their gender.
- In `target0`, the Lower Secondary have the lowest Amount of Income, by irrespective of their gender.
- In `target1`, the Higher Education have the highest Amount of Income in Males, whereas Females have highest Amount of Income in Academic Degree.
- Female of Academic Degree from `target1` have more Amount of Income than the `target0` highest Amount of Income.



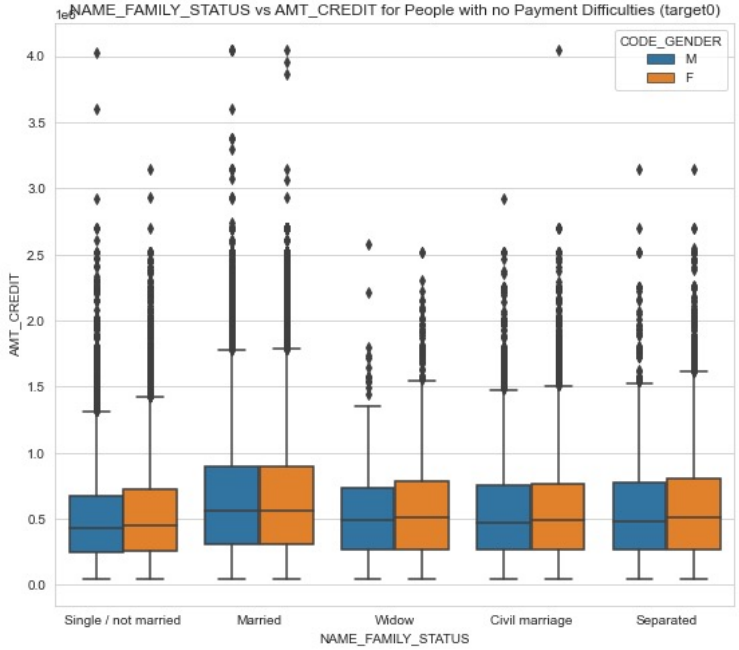


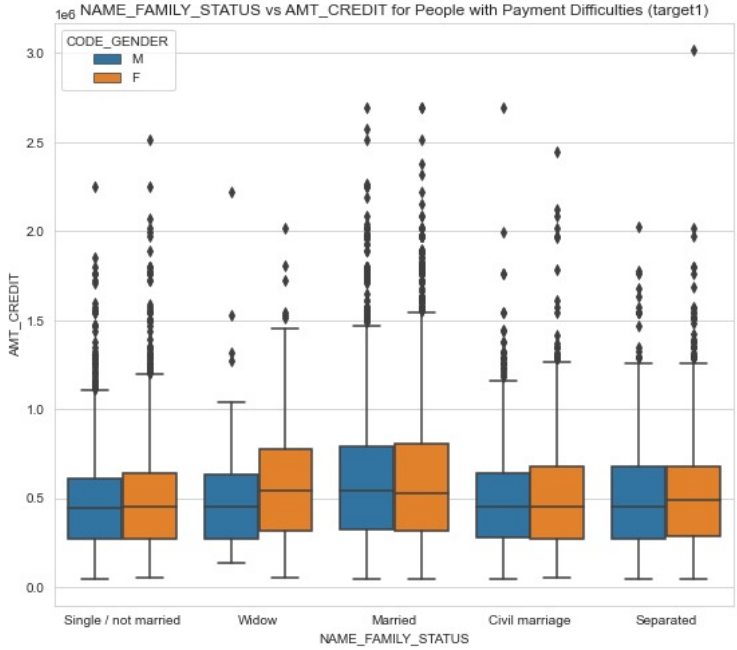
- In both the `target0` and `target1` the Academic Degree and Lower Secondary have the highest and lowest Loan Credit Amount, respectively.
- Males of Academic Degree from `target0` and the Females of Academic Degree from `target1` have slightly similar Loan Credit Amount.





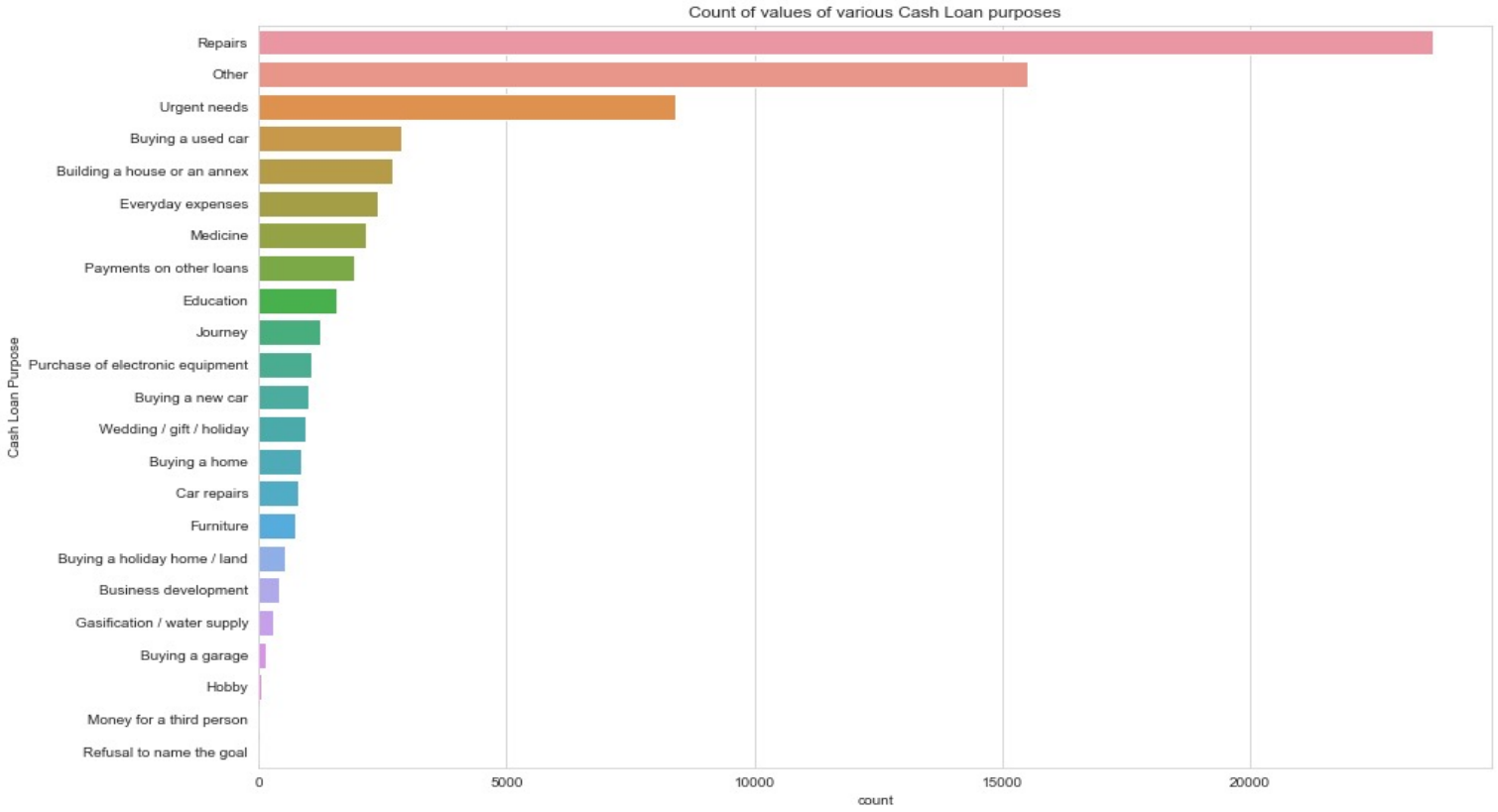
- In `target0` the Married Males and Females have highest Loan Amount Credit, where as Single/Not Married applicants have lowest Loan Amount Credit.
- In `target1` the Married Males and Females have highest Loan Amount Credit, where as Single/Not Married applicants have lowest Loan Amount Credit.
- In `target1`, the Widow Females have more Loan Amount Credit than the `target0` Widow.
- All the other type of Family Status have slightly near to each other in Loan Amount Credit.



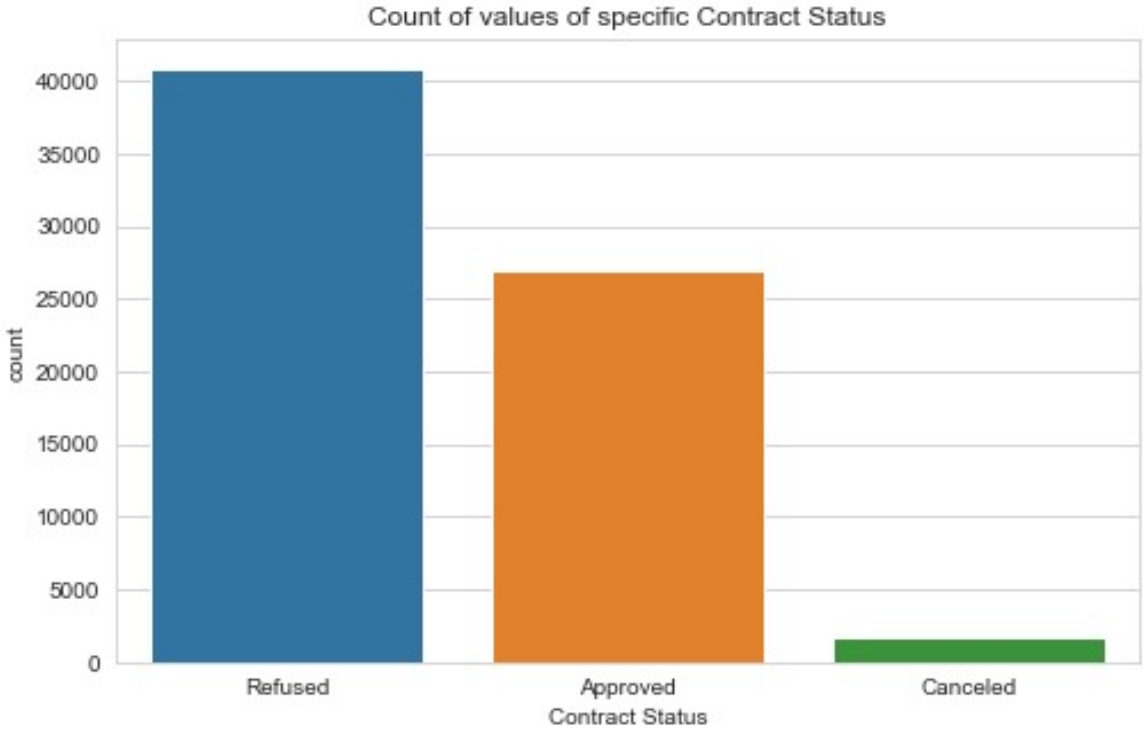


- We can infer that there are outliers in both the `target0` and `target1`, by irrespective of their gender.
- In `target0` Married, Single, Civil Marriage have slightly bigger third quartile as compared to other quartiles, irrespective of their gender.
- In `target1` Married, Single, Civil Marriage have slightly bigger third quartile as compared to other quartiles, irrespective of their gender.
- In `target0` the third quartile of `Separated` Females is bigger than its first quartile, whereas it is vice-versa in `target1`.

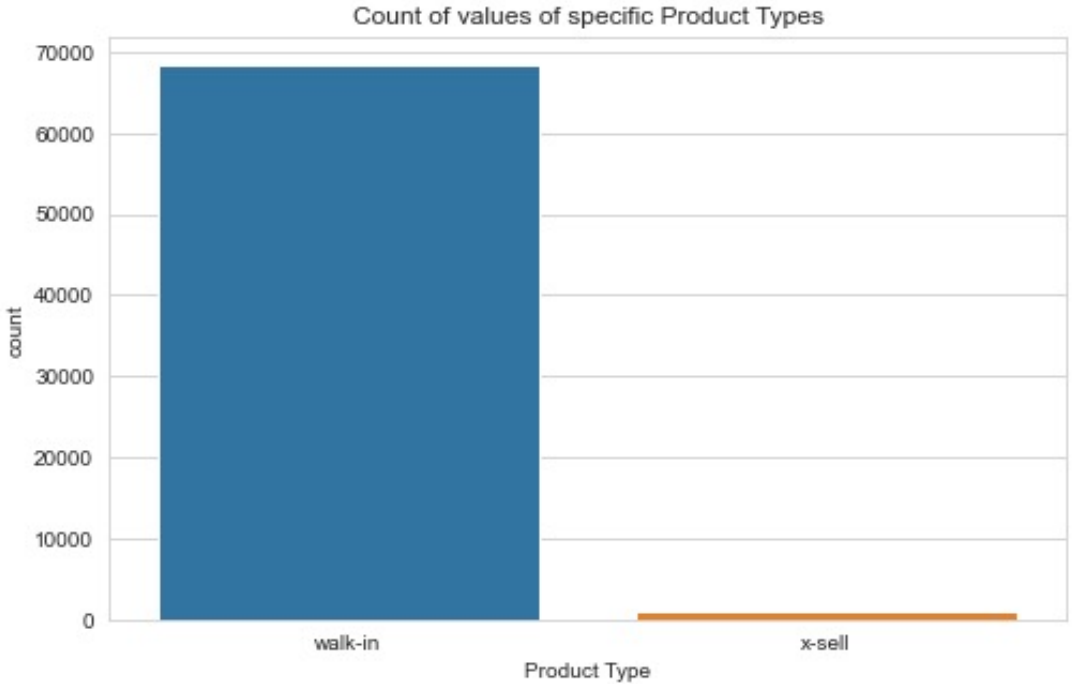
Univariate Analysis on Previous Application



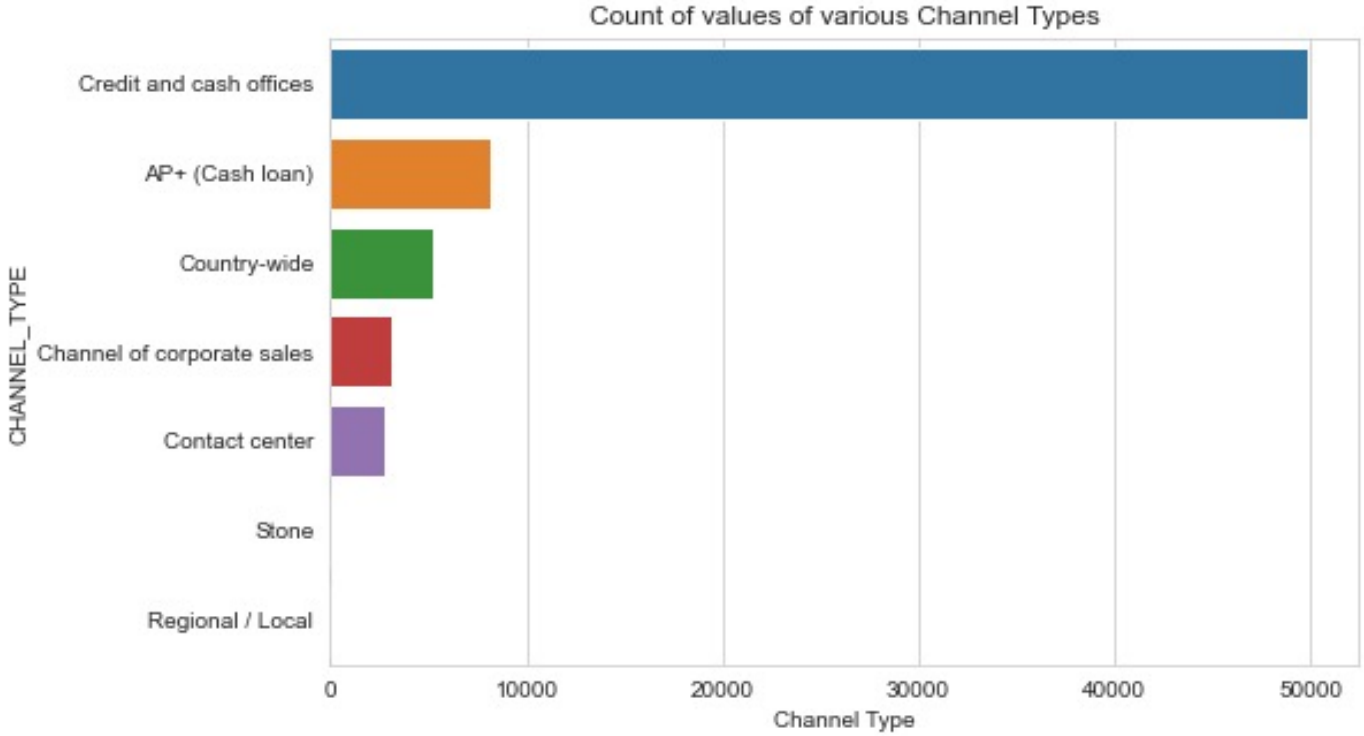
- The highest applications are for the repair purposes.
- The most applications are for the purpose of `repairs`, `other` and `Urgent Needs`.
- It is surprising to see that count of people who applied buying a home are low.



- Most of the applications are being refused.
- There is a considerable gap between approved and refused applications as the number of approved applications are significantly lower than the refused applications count.
- Very Low count of applications are being cancelled.

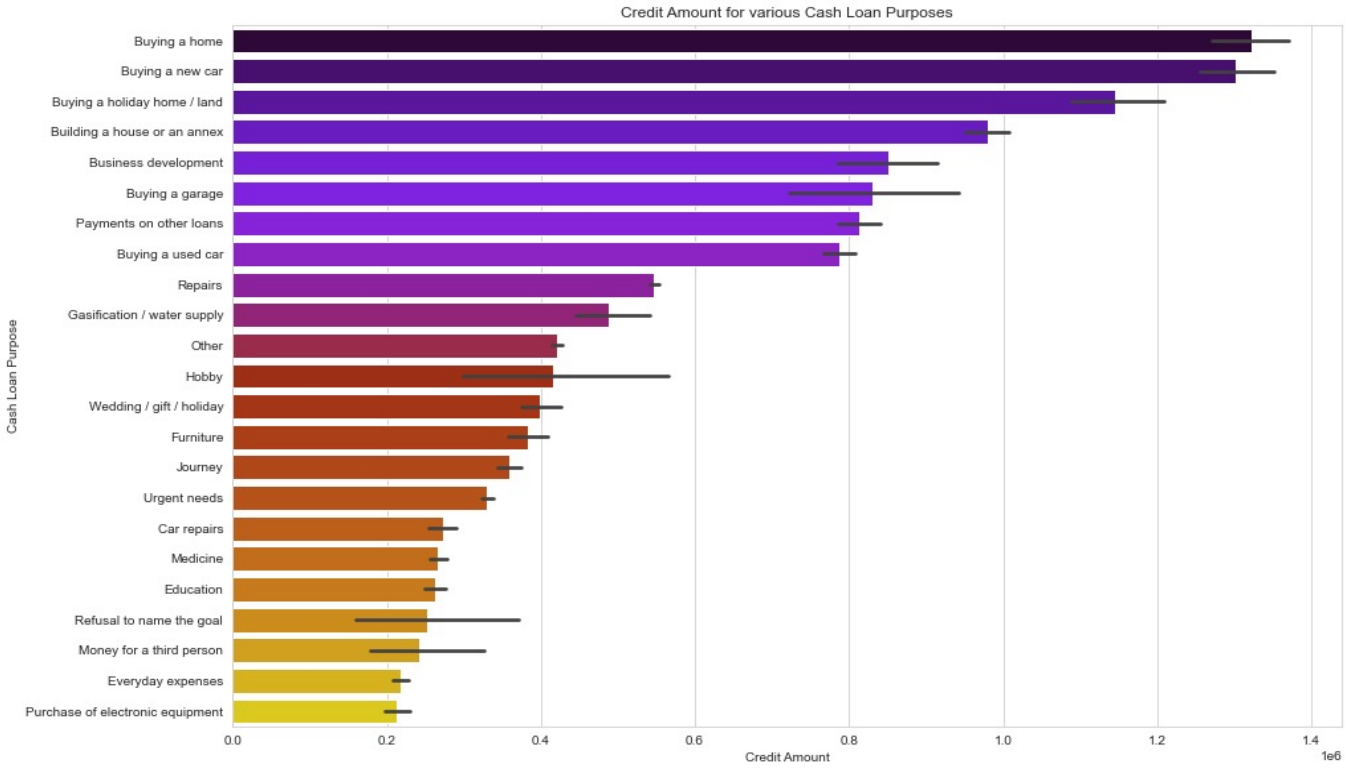


- Almost all the people who applied for the loan were `walk-in` customers
- `X-sell` applications were very few.

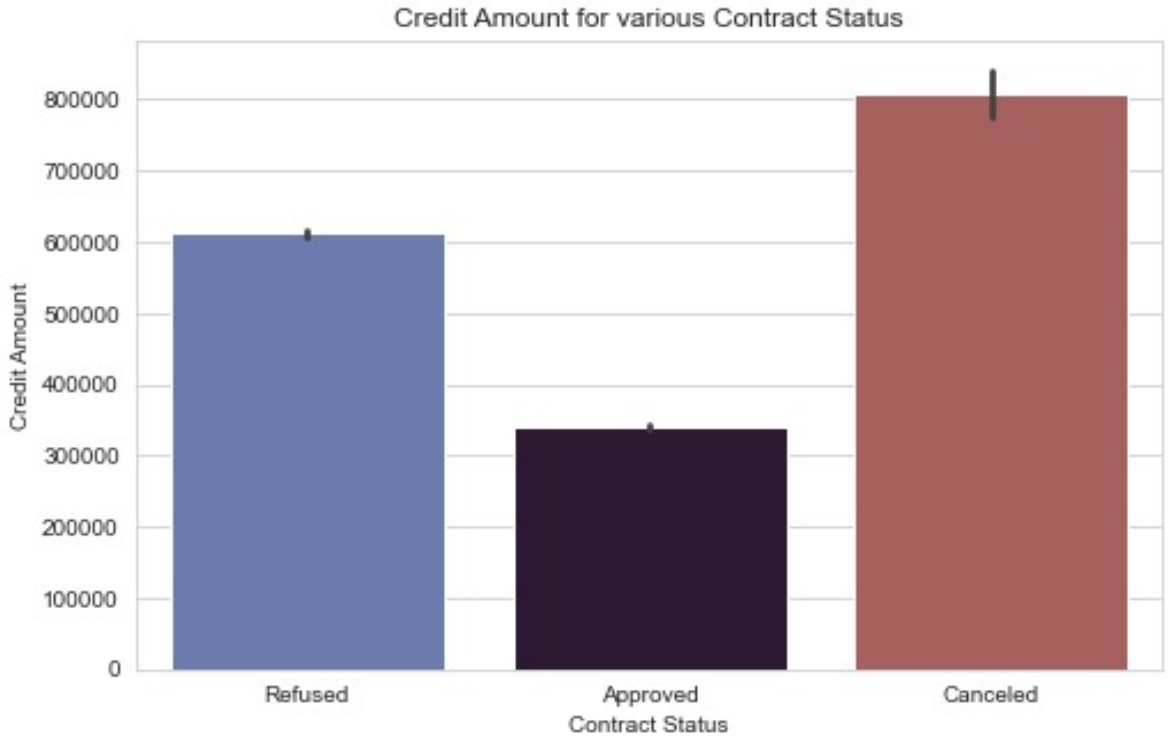


- `Credit and Cash offices` is the channel type with the highest count of values
- `Stone` and `Regional/Local` channels have very low count of values.

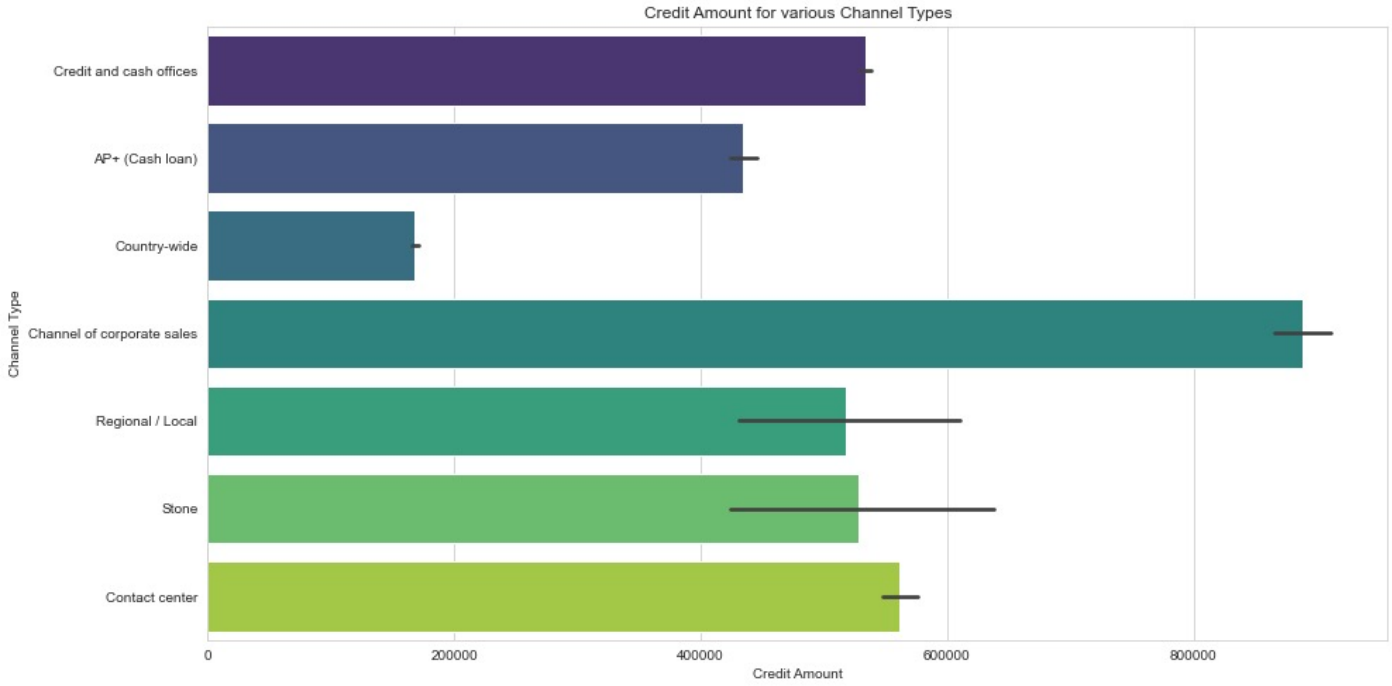
Bivariate Analysis on Previous Application



- The average Credit Amount for buying a new car, building a house or an annex, other loan payments, buying used car, buying a holiday home/land, buying a garage, and developing business is on the higher side.
- The lowest average Credit Amount is for the purchase of electronic equipment.

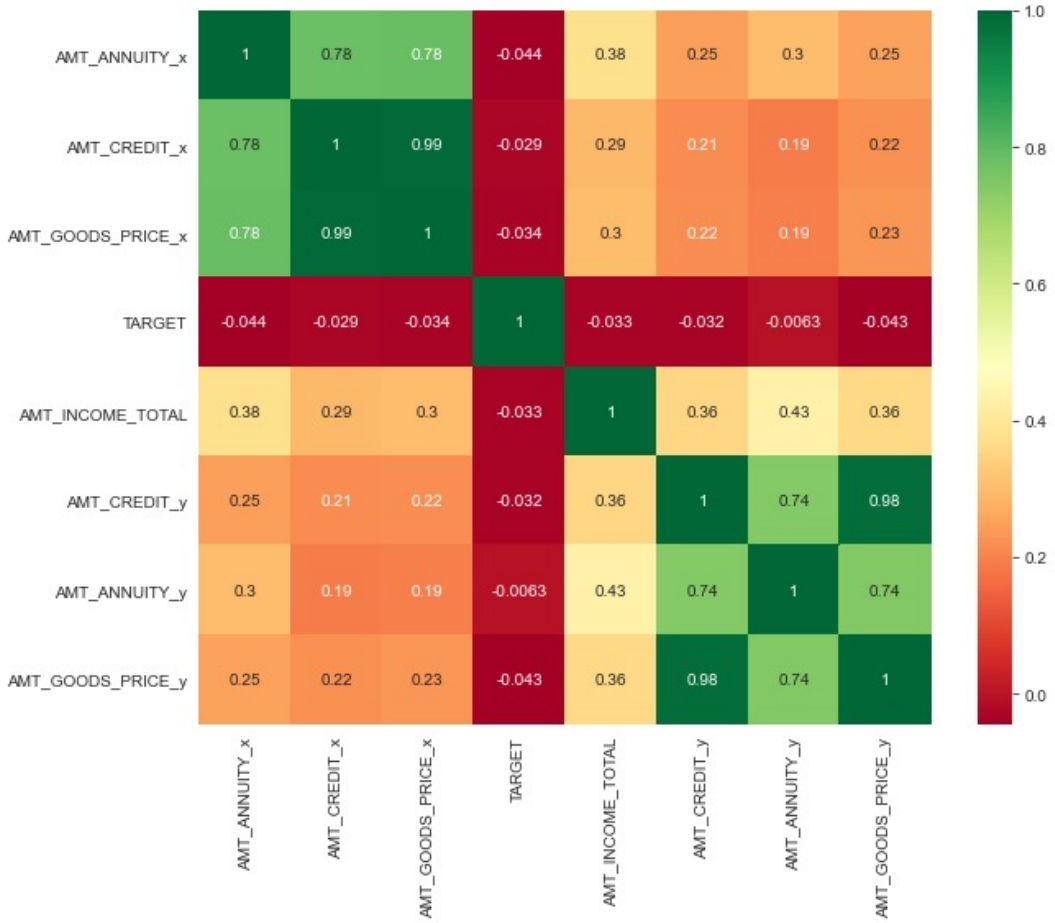


- The Credit Amount for `Cancelled` Contracts are also the highest followed by the `Refused` contracts.
- The `Approved` contracts have the lowest Annuity Amount here as well

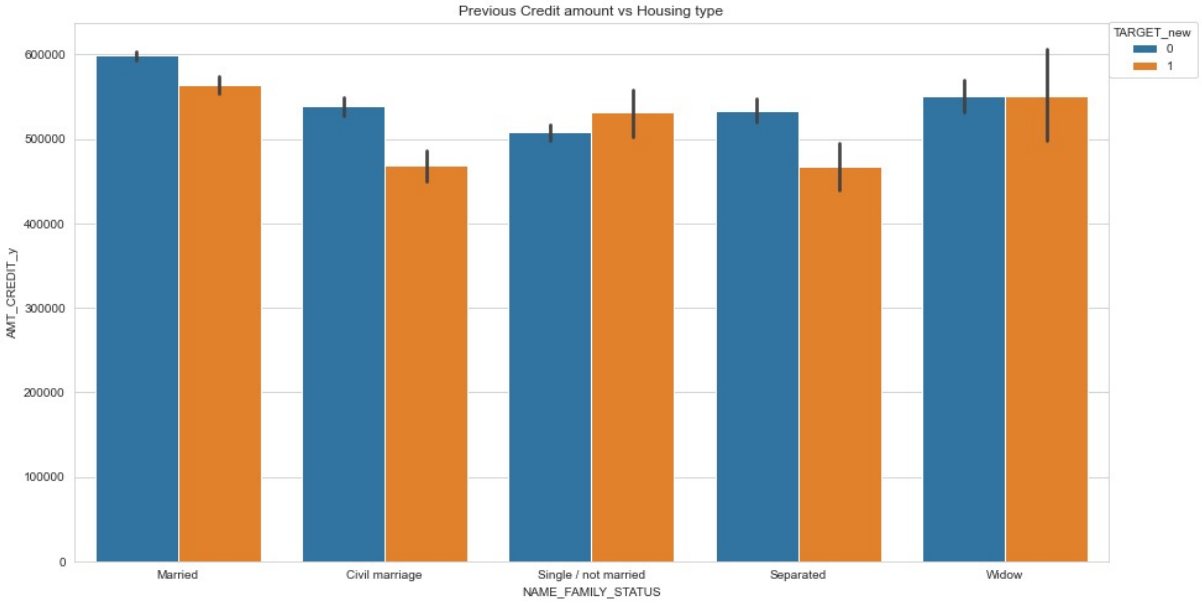


- The Credit Amount for `Channel of the corporate sales` is the highest.
- The `Country-wide` have the lowest Credit Amount as well.
- Although the count of values for `Credit and Cash Offices` is higher, but the credit amount is higher in `Channel of Corporate Sales`.

Bivariate Analysis on Merged Dataset

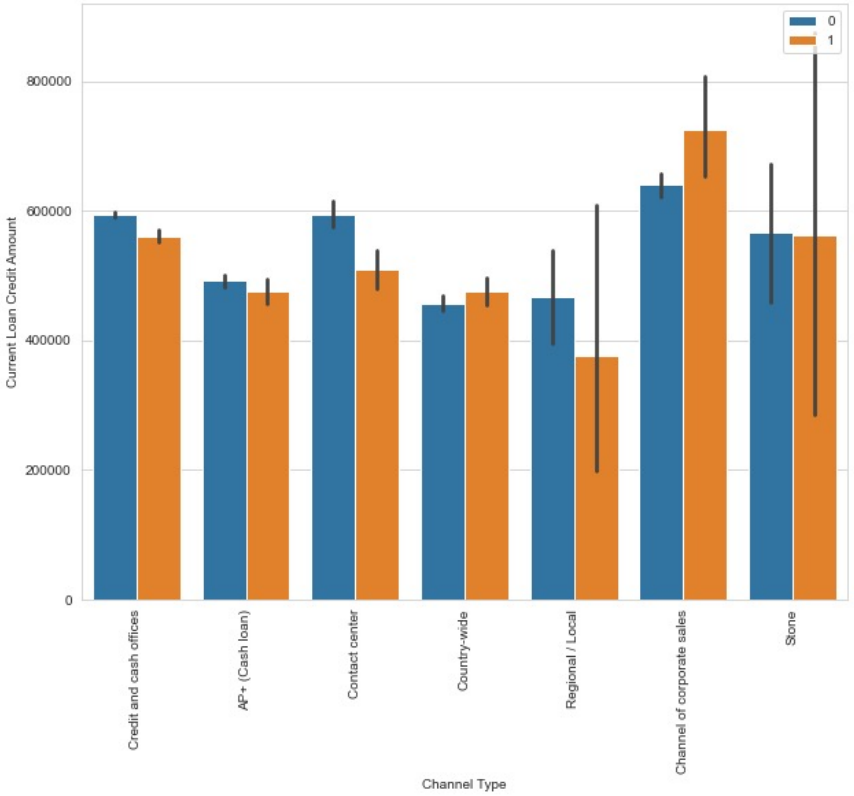

AMT_ANNUITY_x
AMT_CREDIT_x
AMT_GOODS_PRICE_x
TARGET
AMT_INCOME_TOTAL
AMT_CREDIT_y
AMT_ANNUITY_y
AMT_GOODS_PRICE_y
1 0.78 0.78 -0.044 0.38 0.25 0.3 0.25
0.78 1 0.99 -0.029 0.29 0.21 0.19 0.22
0.78 0.99 1 -0.034 0.3 0.22 0.19 0.23
-0.044 -0.029 -0.034 1 -0.033 -0.032 -0.0063 -0.043
0.38 0.29 0.3 -0.033 1 0.36 0.43 0.36
0.25 0.21 0.22 -0.032 0.36 1 0.74 0.98
0.3 0.19 0.19 -0.0063 0.43 0.74 1 0.74
0.25 0.22 0.23 -0.043 0.36 0.98 0.74 1
1.0
0.8
0.6
0.4
0.2
0.0

- `AMT_GOODS_PRICE_y` and `AMT_CREDIT_y` have positive linear correlation
- `AMT_GOODS_PRICE_y` and `AMT_ANNUITY_y` also have positive linear correlation
- `AMT_GOODS_PRICE_y` and `TARGET` have negative correlation
- `AMT_ANNUITY_y` and `AMT_CREDIT_y` have positive correlation
- `AMT_GOODS_PRICE_x` has strong positive linear correlation with `AMT_CREDIT_x` and `AMT_ANNUITY_x`
- `AMT_ANNUITY_x` and `AMT_CREDIT_x` also have positive correlation
- All of the variables plotted above have low correlation with `TARGET`

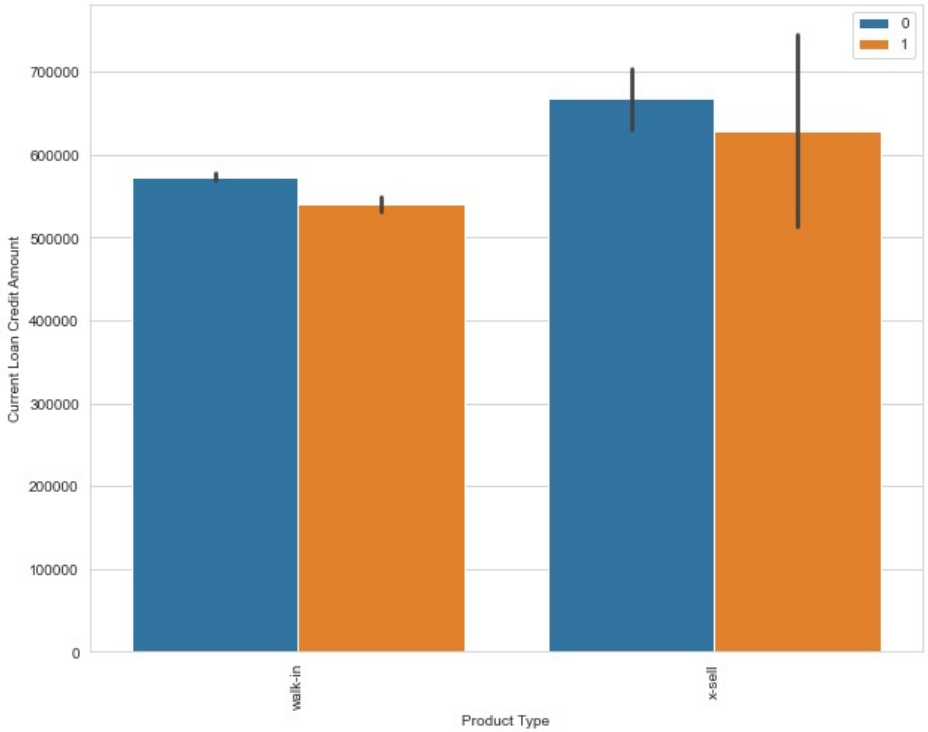


- `Married` people have the highest average credit amount in both the `target0` and `target1`
- The average credit amount for widows in both `target0` and `target1` is equal
- The plots for `Civil marriage` and `Separated` people is almost similar for in both `target0` and `target1`

- `Channel of Corporate Sales` have highest number of people with payment difficulties according to their current Credit Amount.
- - `Regional/Local` have the lowest number of people with payment difficulties according to their current Credit Amount.



- `walk-in` customers have the lowest average credit amount for both `target0` and `target1`
- - `x-sell` customers have the highest average credit amount for both `target0` and `target1`



THANK YOU