Loan Approval Prediction

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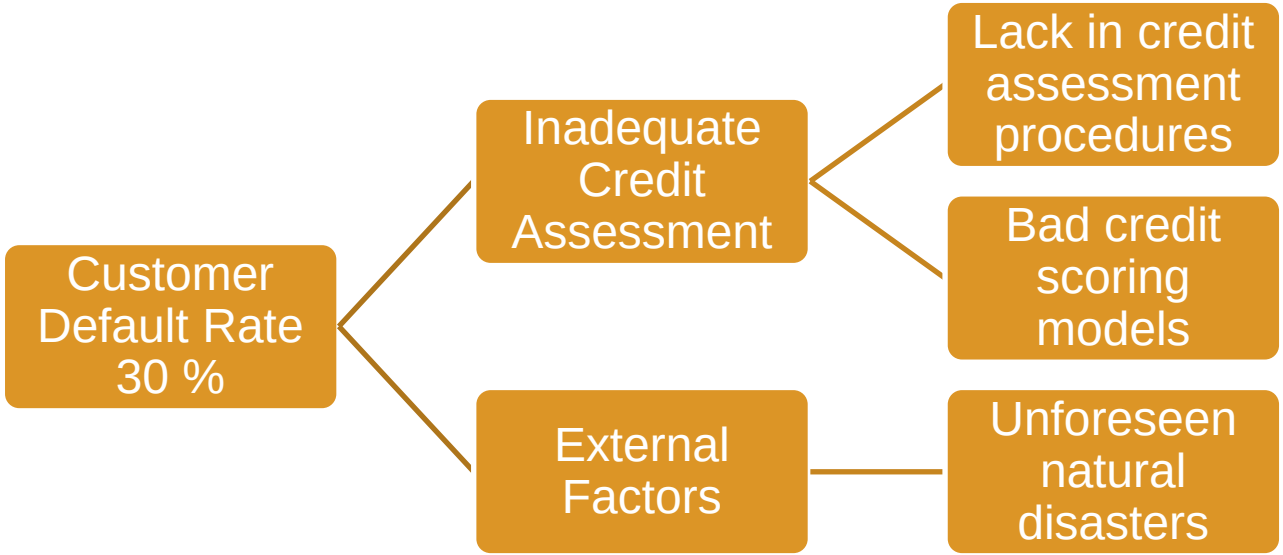
Introduction

LendNTrust is **digital lending company** that **provides loan services** through an **Fintech** application.

John Doe as **Product Development Manager** ask you **as a Credit Risk analyst officer** to create a **model to predict** whether someone is **eligible to get the loan**. So the company can **prevent any loss** assuming if there there is a **default customer**.

Root Cause Analysis



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Problem Statement

How to reduce customer default rate in the next 3 months to 20%?

02

Objective

- Creating a Model to Predict Loan Status
- Loss Prevention from default customer by doin an impact analysis

03

Initial Analysis

1. Data Preparation

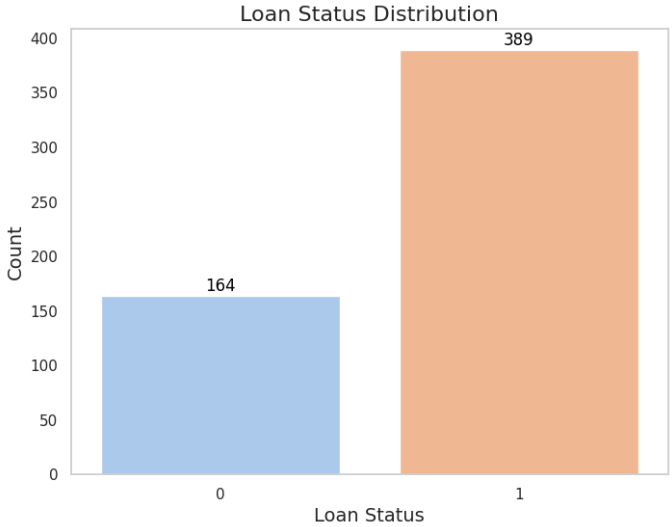
First we should download the dataset and import it to the notebook in this case we are using google colab

The dataset can be downloaded here **GitHub**

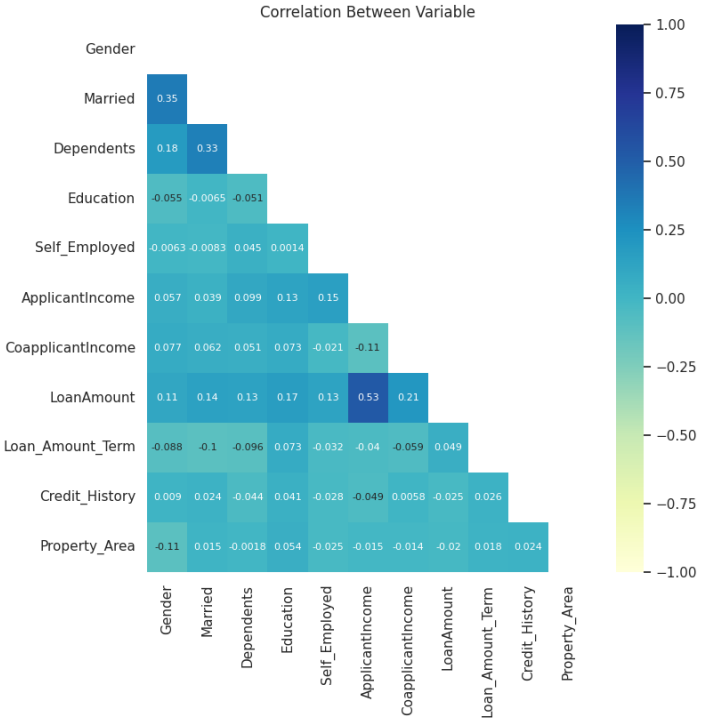
The Dataset is about customer profile of Fintech Company consisted of 615 rows and 13 features. The dataset was used around 8 months ago

2. Approval Number

- There are **Higher approval rate** observed.
- **Further analysis of the approval variable** may **reveal factors driving these outcomes**, aiding in **refining lending criteria** for **improved approval rates**.



3. Correlation between Variable

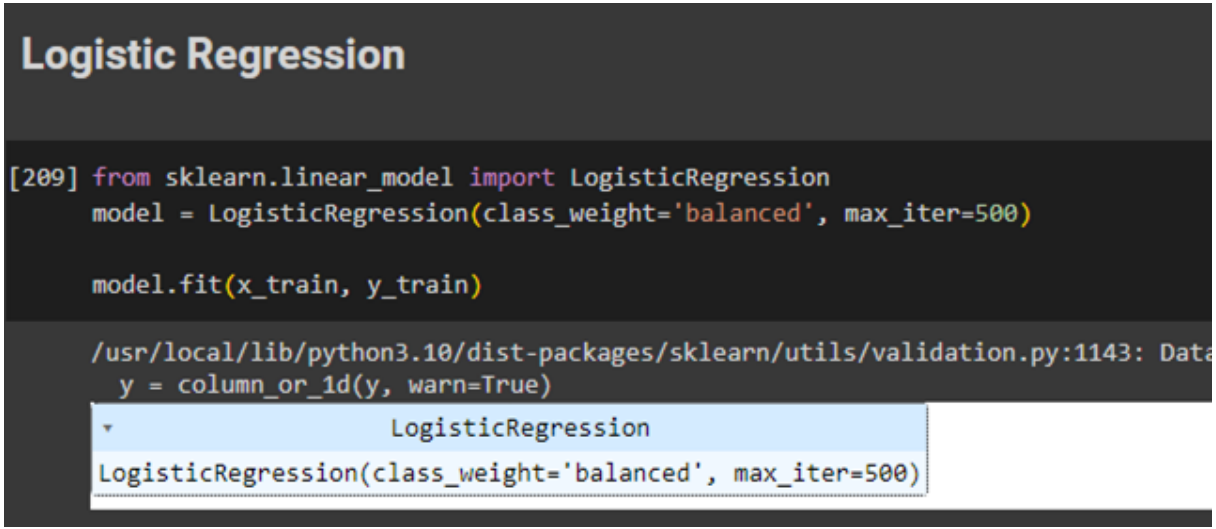


Correlation

- **All Variable have moderate correlation therefore we will use them for initial modeling**

4. Model Score

After using LogisticRegression. In the first attempt, we have **accuracy score of 69 %**



5. Model Score

- **Credit History** probably Has the **Biggest Impact**, **also seen in previous result**
- **Feature Selection** also done by using assumption

  (e.g: Married customer would be considered to have higher number of dependents)

Adjusting the feature increasing model score to 78%

	Feature	Importance
9	Credit_History	3.55
1	Married	0.90
4	Self_Employed	0.74
10	Property_Area	0.46
6	CoapplicantIncome	0.24
3	Education	0.17
5	ApplicantIncome	0.05
2	Dependents	-0.05
8	Loan_Amount_Term	-0.11
0	Gender	-0.28
7	LoanAmount	-0.31

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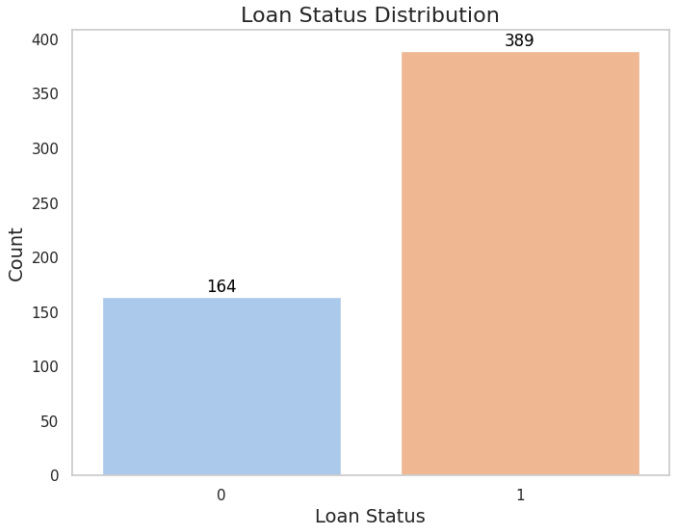
Result

1. Approval Number

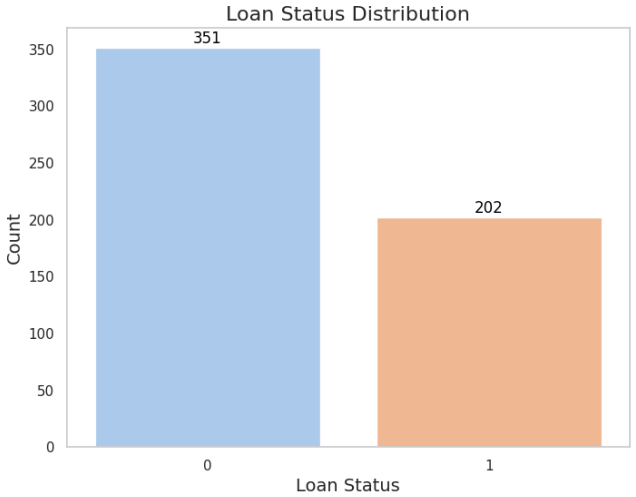
- The **model application** led to a **significant change in predictions**, emphasizing the identification of **potential default cases**

- **Loan approvals** were **approached more cautiously**, possibly **aiming to achieve a balance** between **risk management and profitability**.

BEFORE

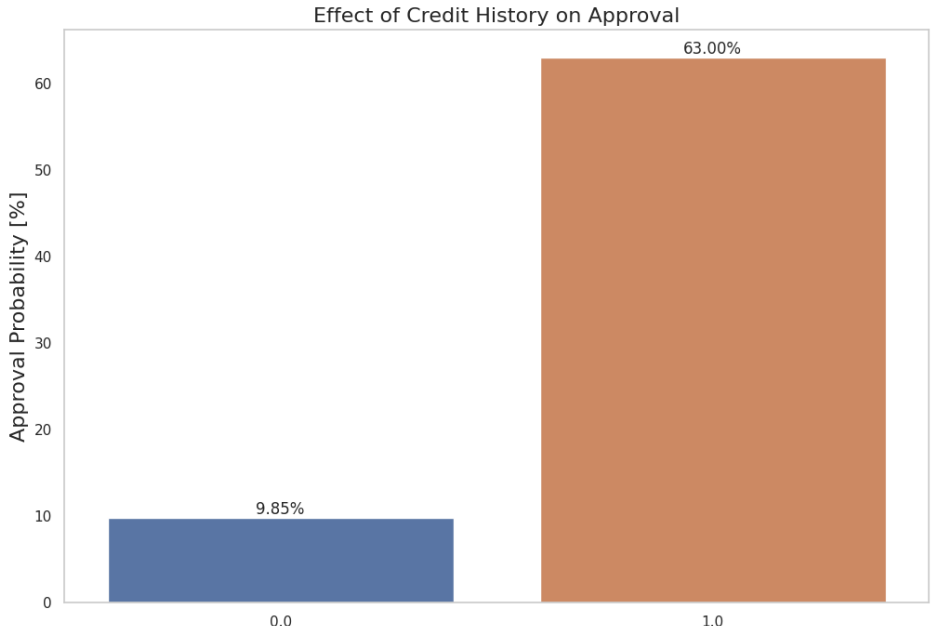


AFTER



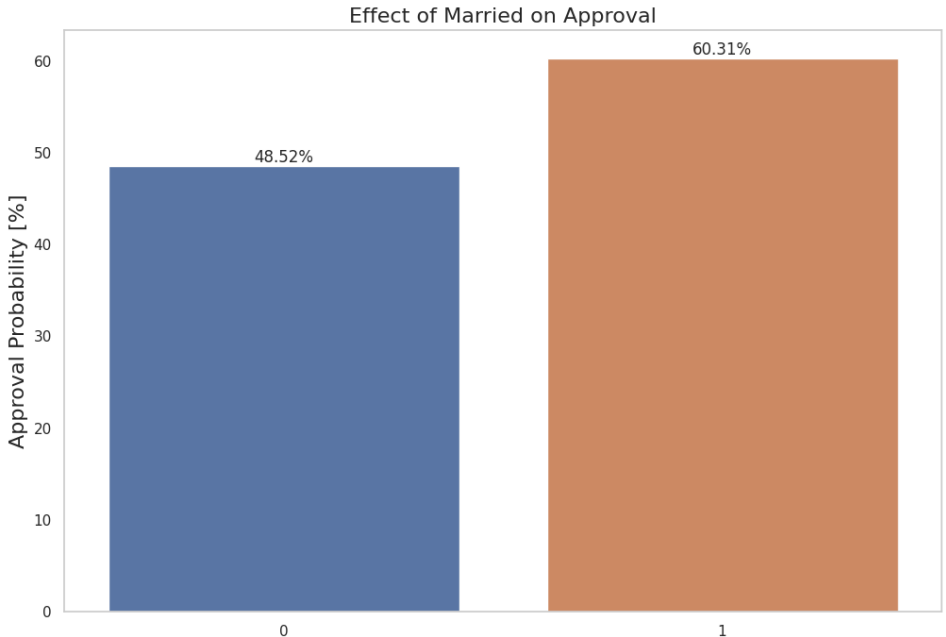
2. Customer Profile

- Customer with **good credit history** have a **higher chance of approval**, it means **proven track record of responsible financial behavior**



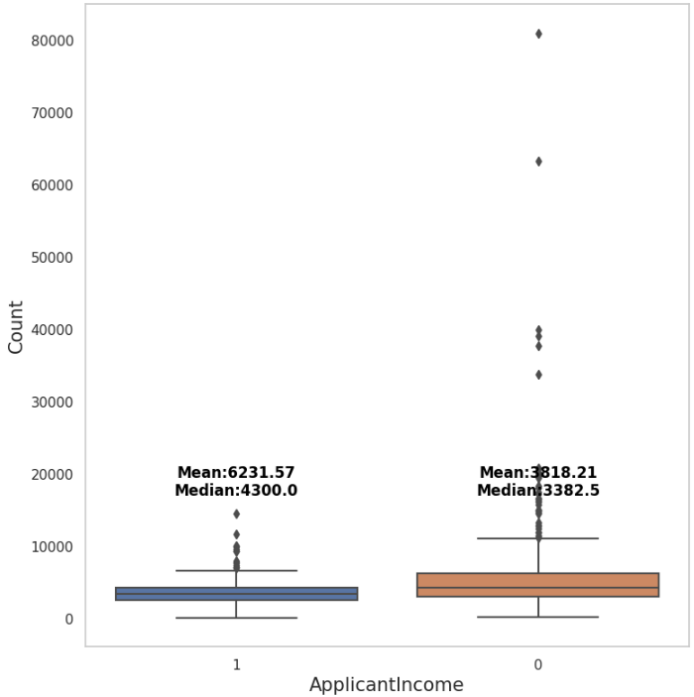
2. Customer Profile

- **Marital status as a potential indicator of financial stability and responsibility**



2. Customer Profile

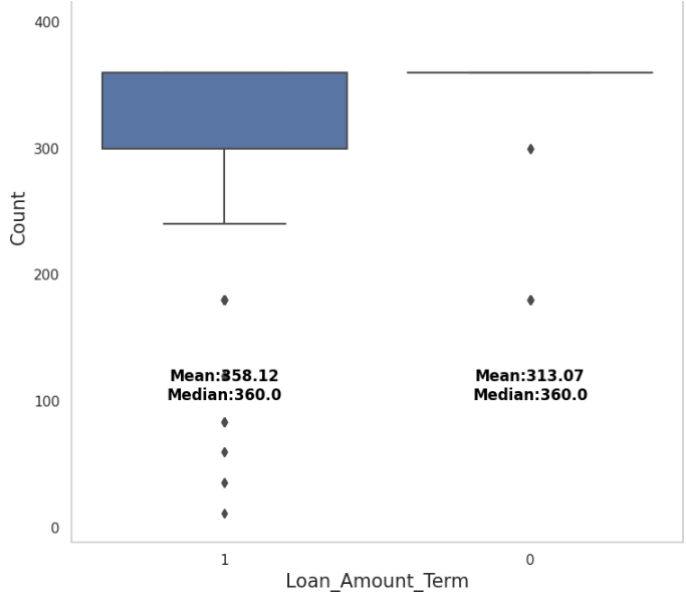
- Customer with **lower income have higher chance their loan approved**, referring to the correlation matrix, it's probably due to **higher loan amount**



2. Customer Profile

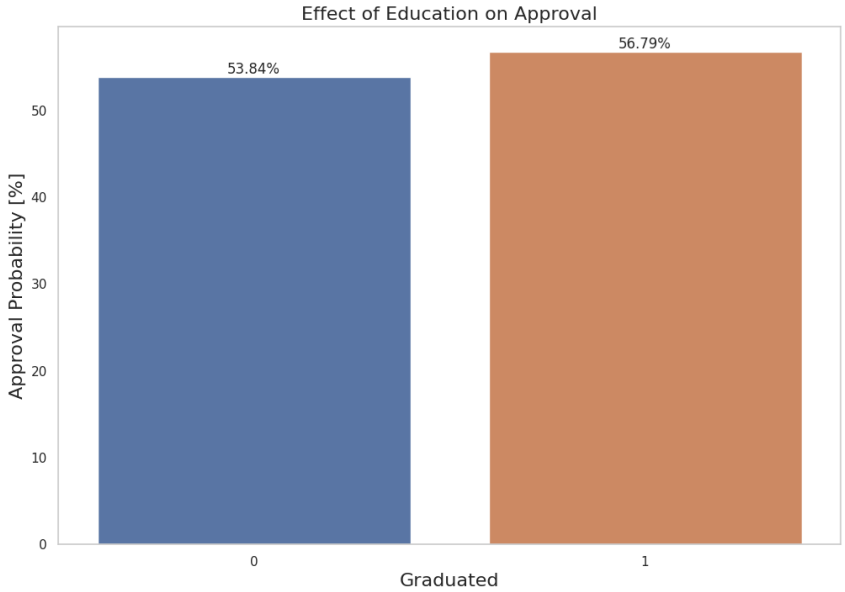
- Customer with **longer term have higher chance their loan approved**

- longer terms might provide lenders with a **sense of stability** and **reduced risk due to extended repayment periods**



2. Customer Profile

Although **not significant**, **customers with higher education status** have a **higher chance** of **loan approval**, which can be assumed to be due to their **potentially higher income**



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Recommendation

5. Recommendation

To Reduce Customer Default Rate in the next period:

Lack in credit assessment procedures

- **Enhance credit assessment procedures** by implementing comprehensive analysis of **borrower's financial stability, mainly Credit History to Maximize the Profit.**

Bad credit scoring models

- **Examine Importance of Features** when building a model to get better model accuracy.

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Benefit-Cost Analysis

6. Benefit-Cost Analysis

After doing sampling, it's found that **there is 202 of 276** people whose loan application approved.

- Assuming there is a customer whose loan application is approved for a total loan amount of $1000
- Considering is several factor for calculate profit
  - Loan Interest: interest rate is 10% per year.
  - Loan Duration: loan duration is 2 years.
  - Operational Costs: operational costs per customer are $10.
- Interest Earned: The interest earned from the customer during the loan duration is **1000 * *0.1* * 2 = $2000**.

Net Profit: The net profit from one customer is the difference between the interest earned and the operational costs, which is

(202*1000*0.1*2)-(10*276) = **$37640**

Appendix:
Colab Link

Thanks!

Any Comments or Feedback are highly appreciated

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