Personal Loan: Statistics and Funnel Analysis

Report Submitted by

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1. Defining Objective and Understanding the Data

1.1 Objective:

The dataset contains of the details of loan applicants from the different areas of India. When the users apply for the Loan, they have to go through the 6 different stages in order to get their loan approved. This case study aims to produce the insights based on the variables such as income, city-wise income comparison to define the target audience who complete all the stages of loan application

1.2 Funnel Analysis:

Funnel analysis is a method of understanding the stages required to reach an outcome and how many users get through each of those stages. The set of stages is referred to as a "funnel" because the typical shape visualizing the flow of users is similar to a funnel in your kitchen or garage.

In this case study funnel analysis is used to know the converstion rarte of loan application from one stage to next step as well as to find the number of loan application completing all the stages of loan approval process.

1.3 Data Understanding:

Dataset for credit risk analysis consist of different variables. Following table contains the variable name or column name and its description.

Variable Name/ Column Name	Description
Id	Application Id
Application Date	A date at which applicant submitted the loan application.
City	City of loan applicant
Income	Monthly income of loan applicant
Stage	Stage completed by loan application

2. Data Preparation and Exploratory Data Analysis

2.1 Data Preparation:

Data preparation consist of verifying the quality of data, checking missing values, missing value treatment, detection of outlier.

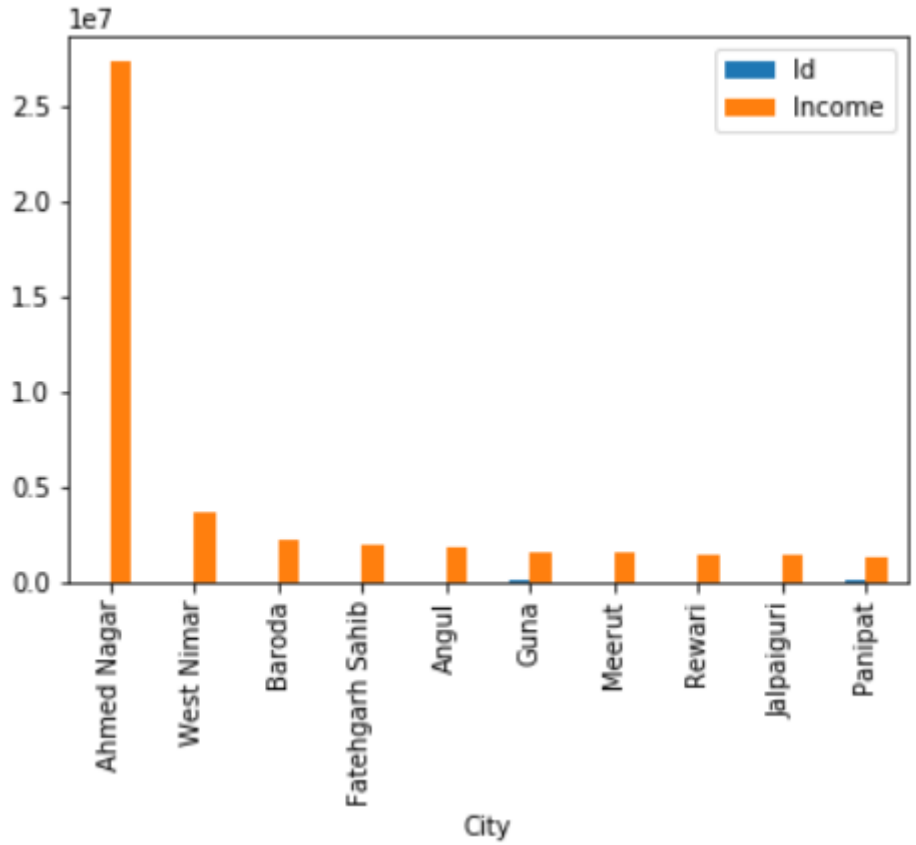
2.2 Missing Values:

The data does not contain any missing value.

2.3 Exploratory data analysis:

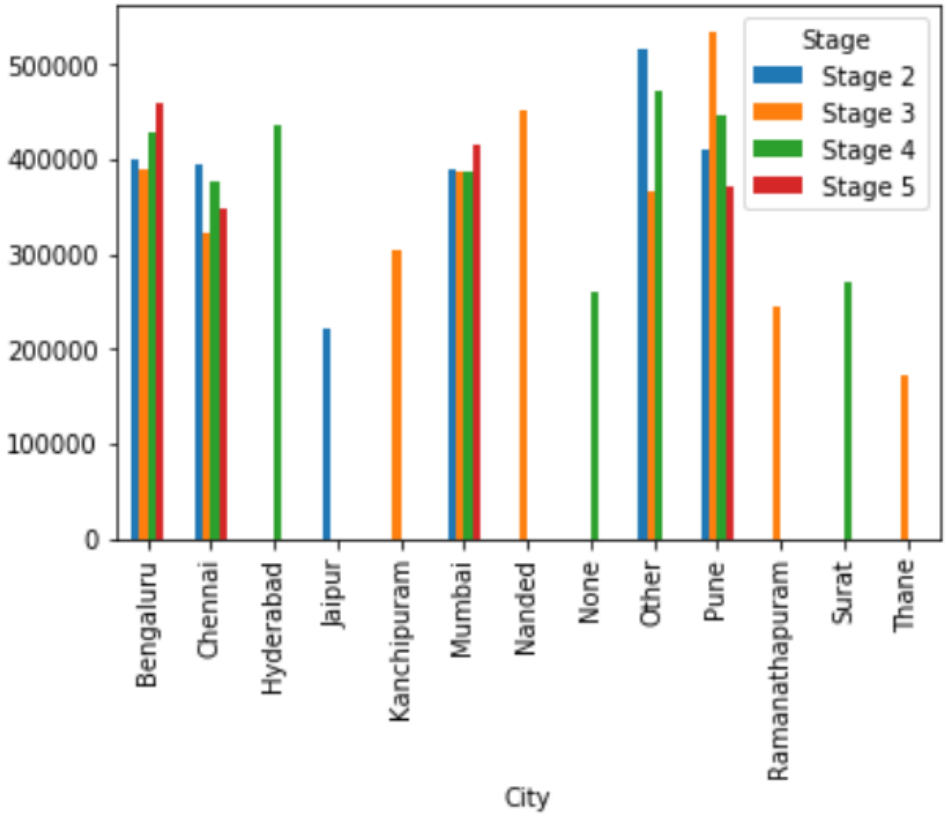
a. Income level of applicant across the city:

A data frame is created by dropping the applications by applicant city and mean income of applicants in the city segment is plotted. Below bar chart shows the mean income of top ten cities.



b. Application reaching stage 2 and above across the cities:

Total number of cities under study are 417. The bar chart is plotted for the application reaching stage 2 and above across the cities based on the income. Following chart shows the same bar chart:



c. Overall conversion rate form stage 0 to stage 5:

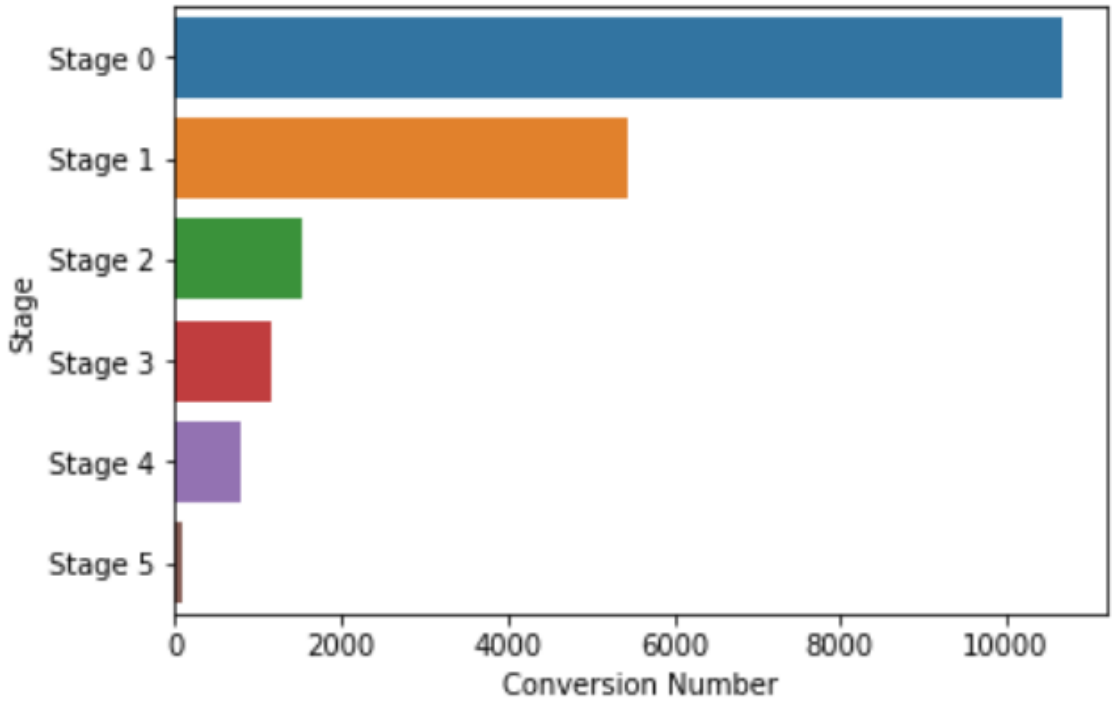
Total number of applications in each stage under study are as per follows:

	Stage	Id
0	Stage 0	5244
1	Stage 1	3917
2	Stage 2	353
3	Stage 3	359
4	Stage 4	716
5	Stage 5	89

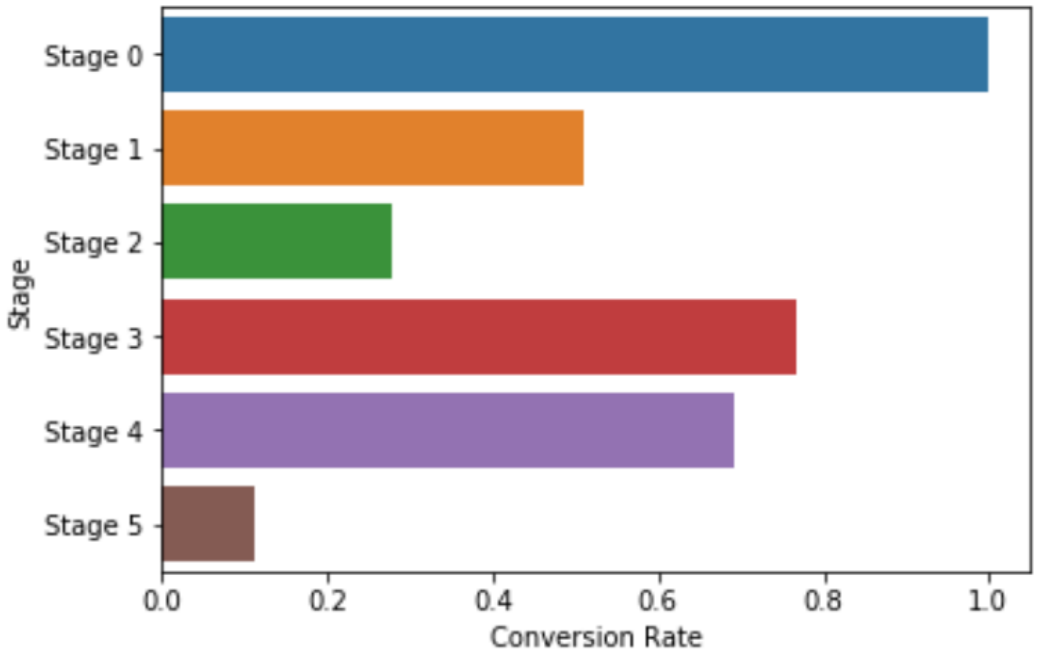
The conversion Rate between any two stages for e.g. stage X and stage Y can be defined as the ratio of the number of the customers who reached stage Y and beyond to the number of the customers who reached stage X and beyond. Conversion

	Stage	Id	Conversion Number
0	Stage 0	5244	10678
1	Stage 1	3917	5434
2	Stage 2	353	1517
3	Stage 3	359	1164
4	Stage 4	716	805
5	Stage 5	89	89

The below bar chart shows conversion number for each stage.



As per the chart above conversion number are decreasing from stage 0 to stage. From the conversion number the conversion rate can be found out for the loan applications.

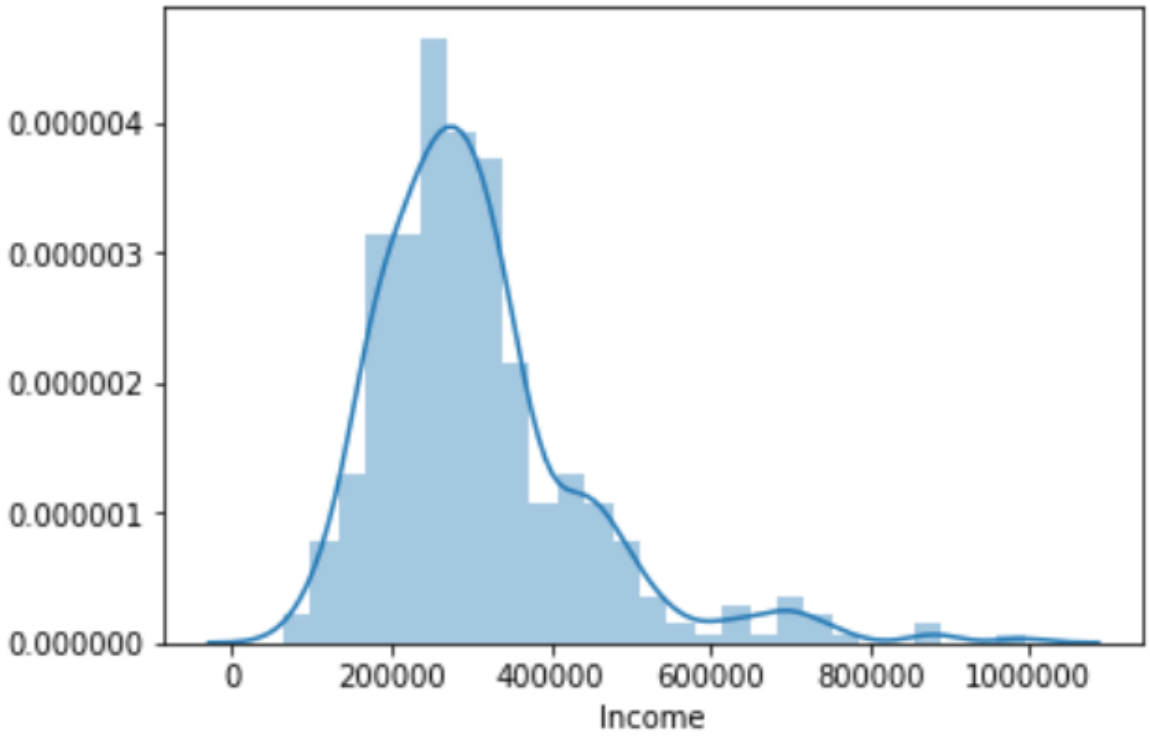


The above bar chart shows the conversion rate of loan application from stage 0 to stage 5. Conversion rate for stage 5 is least of the all. Also stage 2 is observed to be bottleneck in the loan application approval process. The conversion rate can be converted into funnel as follows:

	Stage	Id	Conversion Number	Conversion Rate	Funnel
0	Stage 0	5244	10678	1.00000	1.000000
1	Stage 1	3917	5434	0.50890	0.508897
2	Stage 2	353	1517	0.27917	0.142068
3	Stage 3	359	1164	0.76730	0.109009
4	Stage 4	716	805	0.69158	0.075389
5	Stage 5	89	89	0.11056	0.008335

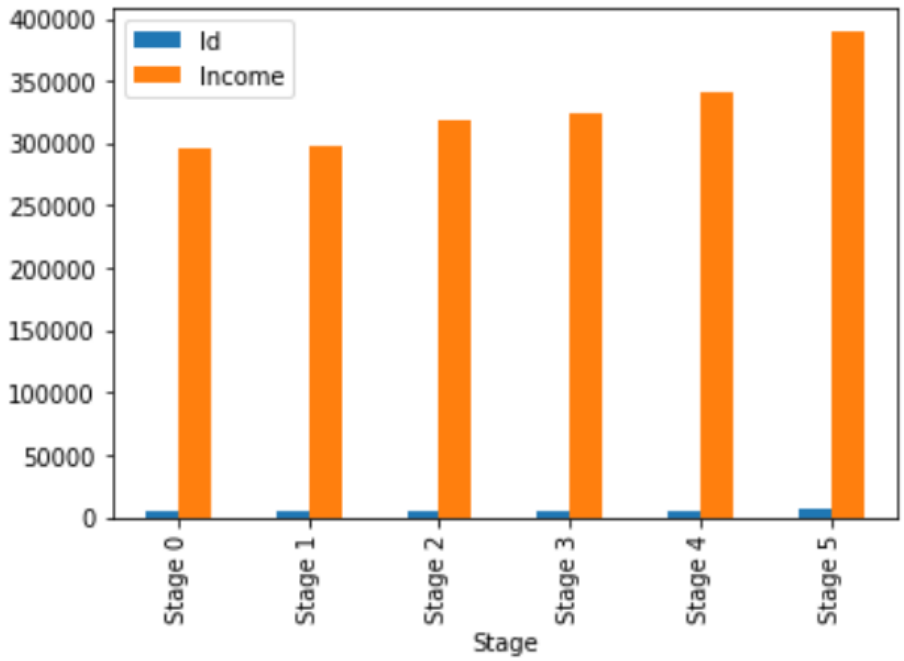
d. Impact of cities and income level on conversion rate:

Considering income of loan applicant as the driving factor for conversion rate of applications, income of applicant is plotted to check the approx. range of income for which conversion rate is high.



The above normal distribution graph shows that the approx. income of the applicants having higher conversion rate is between 200000 and 400000.

Also stage wise average income will have effect in conversion rate of applications. Below is the plot showing average income of applicants per stage:



Following figure shows the funnel diagram for stage wise loan application process. At stage 0 it is considered as universe of application and hence conversion rate is considered as 1.