

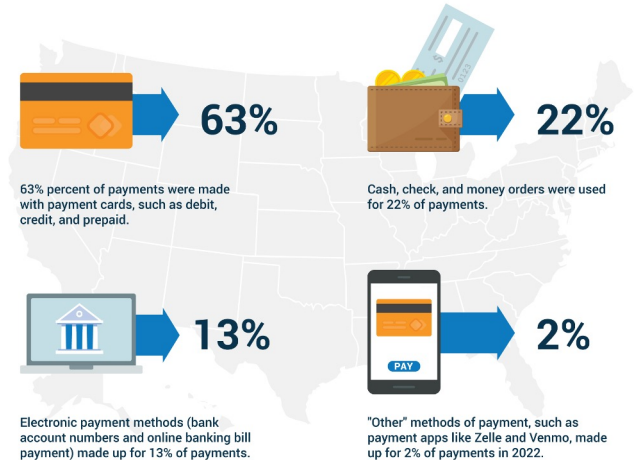
American Express - Default Prediction

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Background

- Fundamental role of credit card in modern day
- Credit card contribute to the convenience of daily purchase
- Credit card reduce the need for carrying large amount of cash
- They offer lucrative rewards
- They facilitate the full amount payment over time


The Most Popular Payment Methods in the U.S. 2022



Source: Federal Reserve Bank of Atlanta

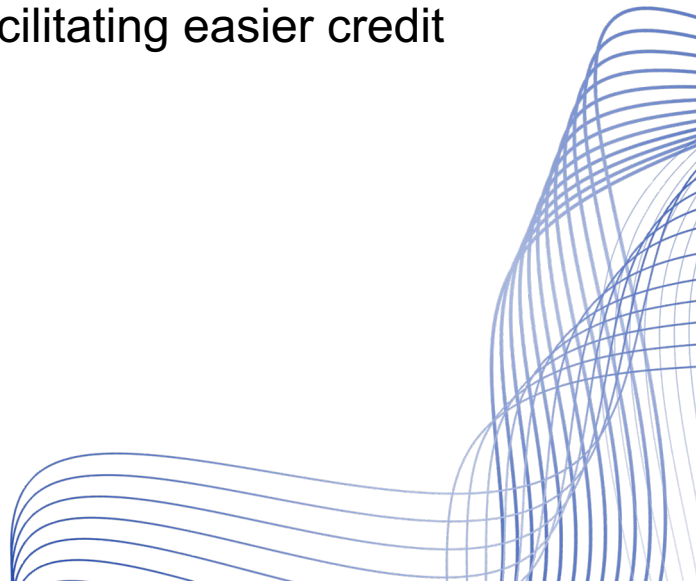


Problem Statement

- Develop a machine learning model to predict credit default
 - Improving lending decisions & enhancing the customer experience
- 

Problem Importance

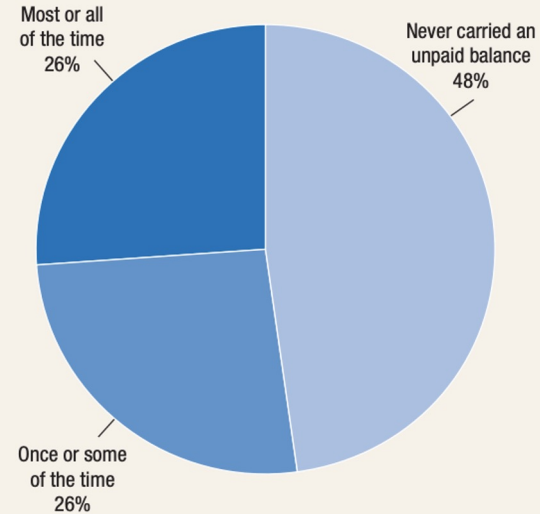
- Mitigating Financial risks associated with default.
- Optimizing lending decisions for better business economics.
- Improving overall customer experience by facilitating easier credit card approval system for the applicants.
- Reduce Cost and Increase Efficiency



Problem Challenges

- Diverse Customer Profiles
- Evolving Economic Conditions
- Behavioral Data
- Data Anonymization

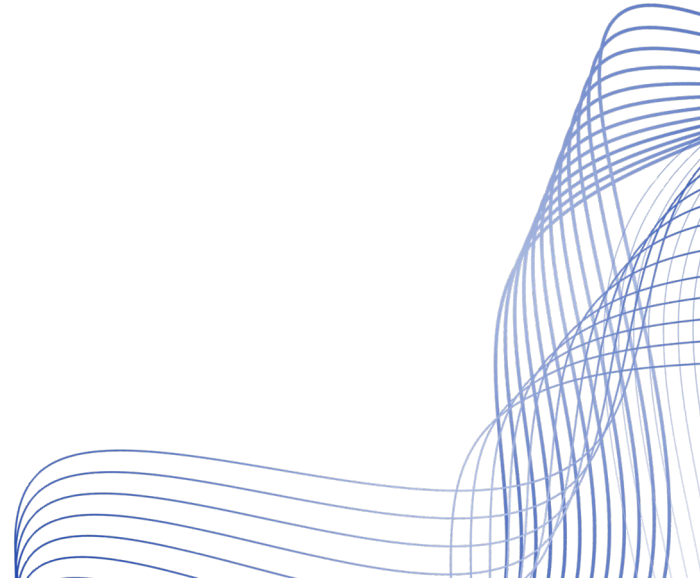
Figure 20. Frequency of carrying a balance on one or more credit cards in the past 12 months



Note: Among adults with at least one credit card.

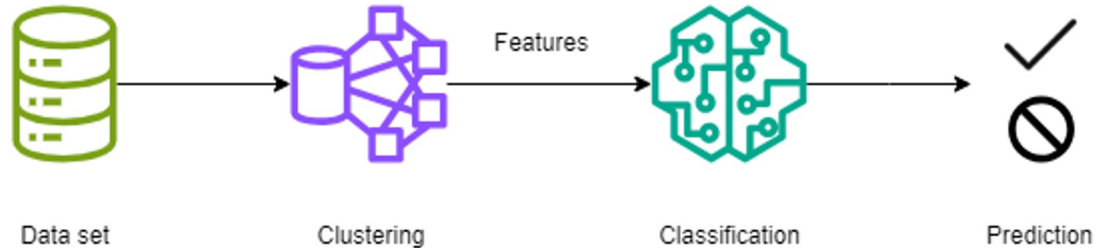
Data Challenges

- Size of the dataset
- Data Schema
- High Dimensionality

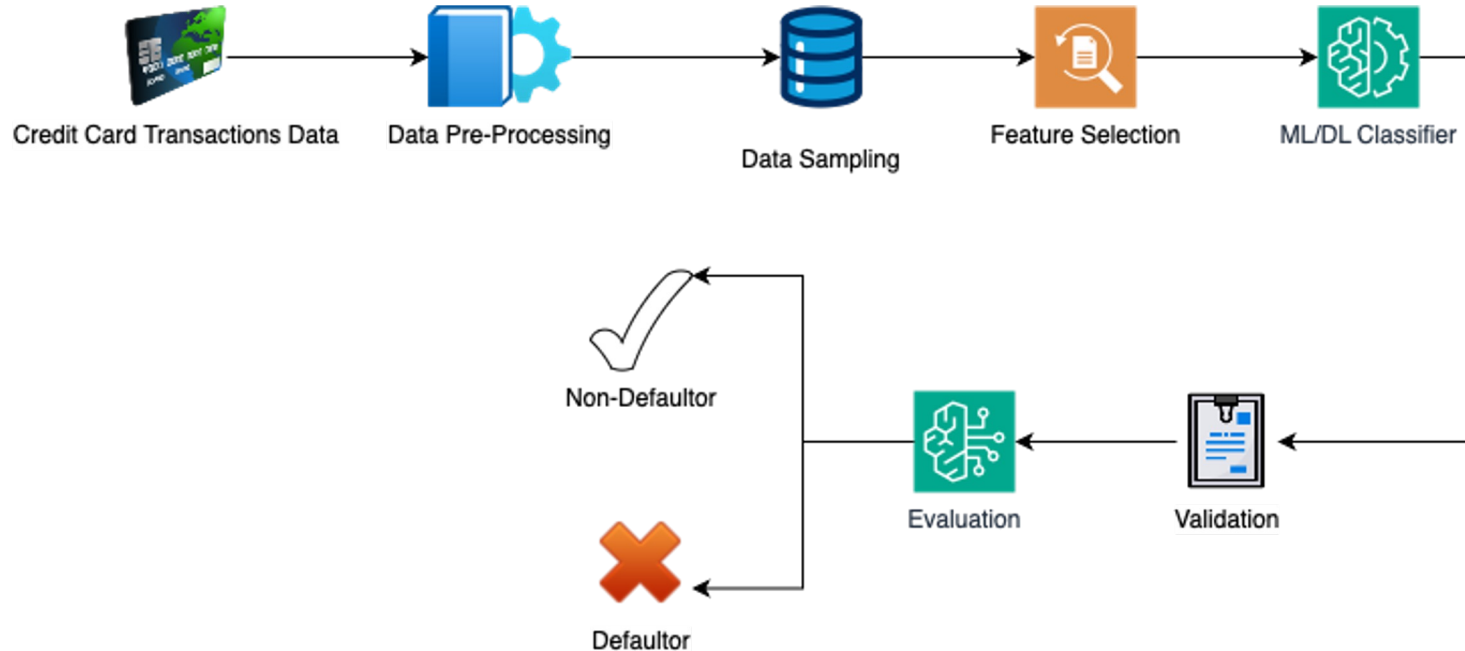


Essential Task

- Clustering
- Classification



Data Mining Pipeline



Initial Exploratory Data Analysis

- The raw data requires preprocessing before it can be fed to a model.
- Data Preprocessing steps:
 - There are multiple entries for a single 'Customer_ID' which need to be grouped
 - Remove irrelevant columns
 - Handle missing values in the remaining columns

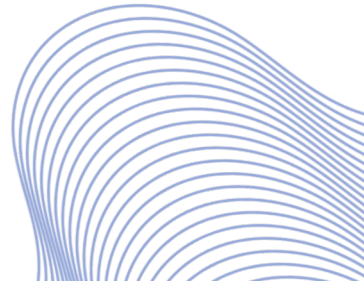
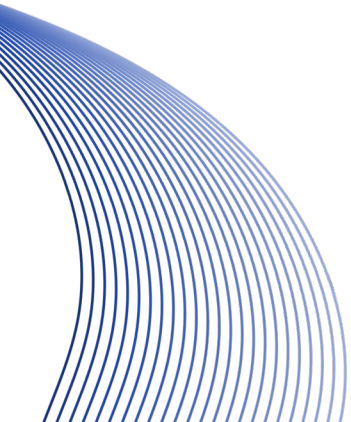
Initial Exploratory Data Analysis

Null values in each
column

customer_ID	0
S_2	0
P_2	1147
D_39	0
B_1	0
...	
D_140	1065
D_142	124272
D_144	1079
D_145	2632
target	0

Train data: (5531451, 190)

Is Data Collection Needed?



The image features a white background with three decorative elements in the corners: a series of concentric blue circles in the top right, a similar series in the bottom right, and a series of concentric blue circles in the bottom left. The text "Thank You" is centered in a large, bold, black font.

Thank You