



# Coupon Redemption Prediction



A report by Monil Gudhka



# About

Title:

Coupon Redemption Prediction

Contest:

[AmExpert 2019 - Machine Learning Hackathon](#)

Repository:

[https://github.com/monilgudhka/coupon\\_redemption\\_prediction](https://github.com/monilgudhka/coupon_redemption_prediction)

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# Problem Statement

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- Client: retailer
- Marketing:
  - Attract new customers
  - Retain & reinforce loyalty of existing customers
  - Discount marketing: widely used promotional techniques
  - Prediction of the redemption behaviour are crucial
- Solution will help in
  - Accurately design coupon construct
  - Develop a more precise and targeted marketing strategies

# Evaluation Metric

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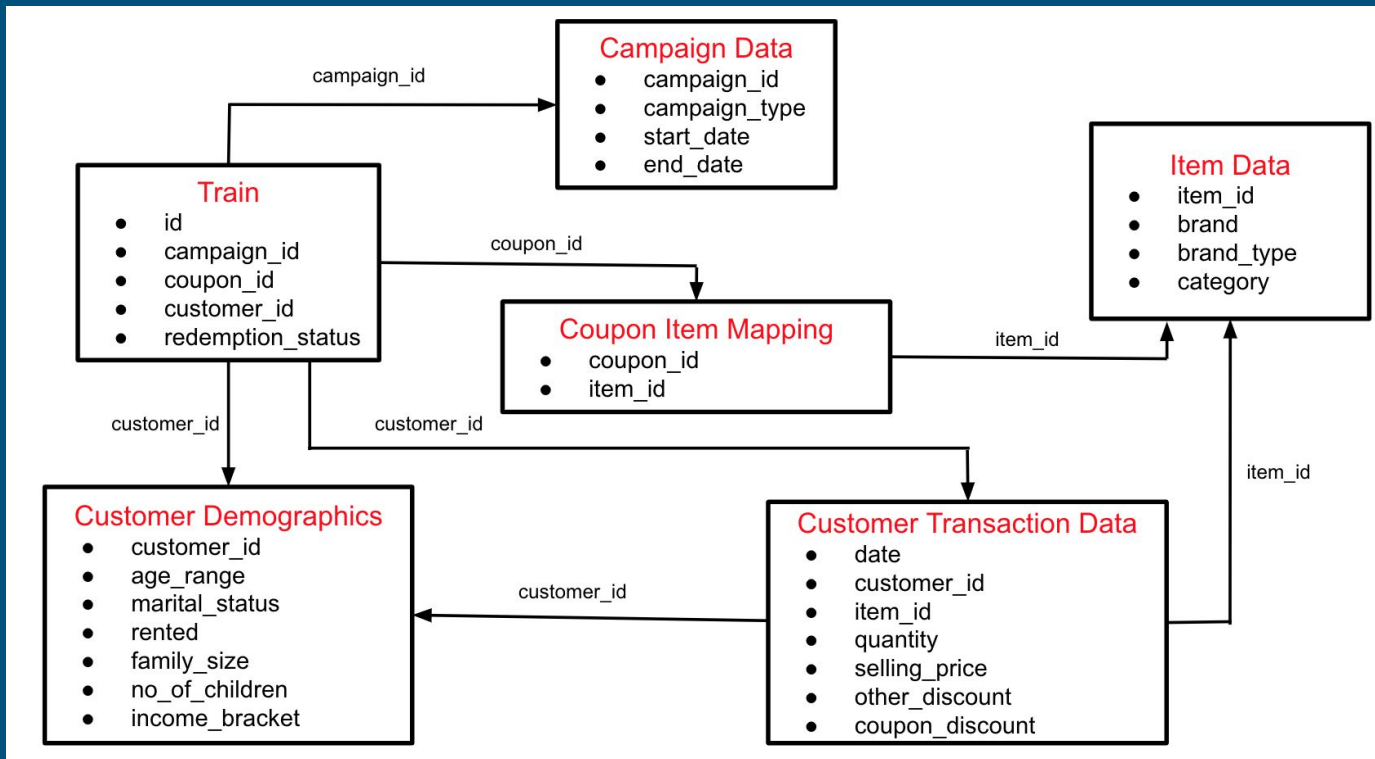
Area under the ROC curve

between the predicted probability and the observed target

(AUC-ROC)

*across all entries in the test set*

# Dataset



# Data Cleaning

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Missing data:

no\_of\_children: Assuming it to be Zero

marital\_status: If family\_size - no\_of\_children > 1  
then Married else Single

Customers without Information: Handle them with algorithm

Outliers:

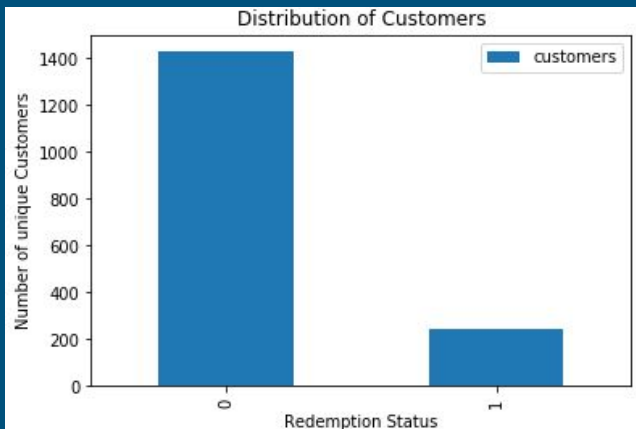
- Many outliers in the customer's transactions
- Prediction algorithm has to be trained with outliers

# Data Merging

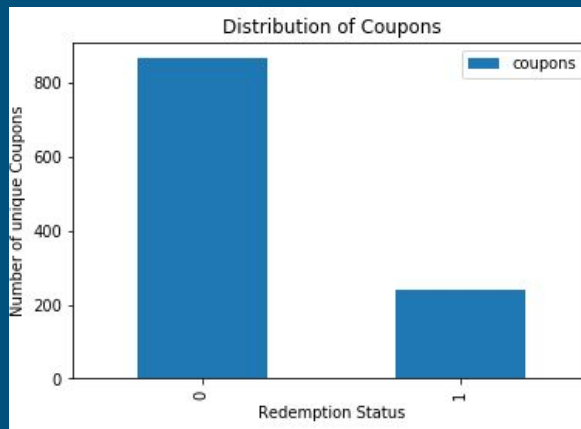
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- Coupon Information
  - Extracting summary variables from coupon information
- Customer Behaviour
  - Extracting summary variables from customer's transactions
- Campaign and Customer Information
  - Left Join of both data on customer\_id
- Campaign and Coupon specific Customer Behaviour
  - Transaction summary from 223 days prior to 110 days prior of campaign's start date
  - Transaction summary within the same date range but for items covered in the coupon
- Deriving Features
  - Represents change in customer behaviour
  - Represents match of customer behaviour with that of coupon

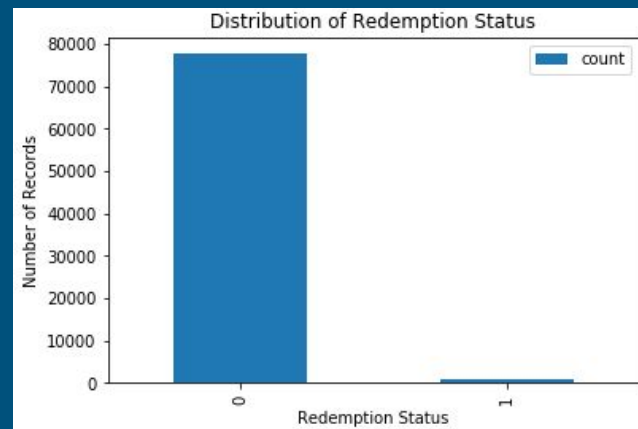
# Analysis: Redemption



78% coupons were never redeemed by any customers



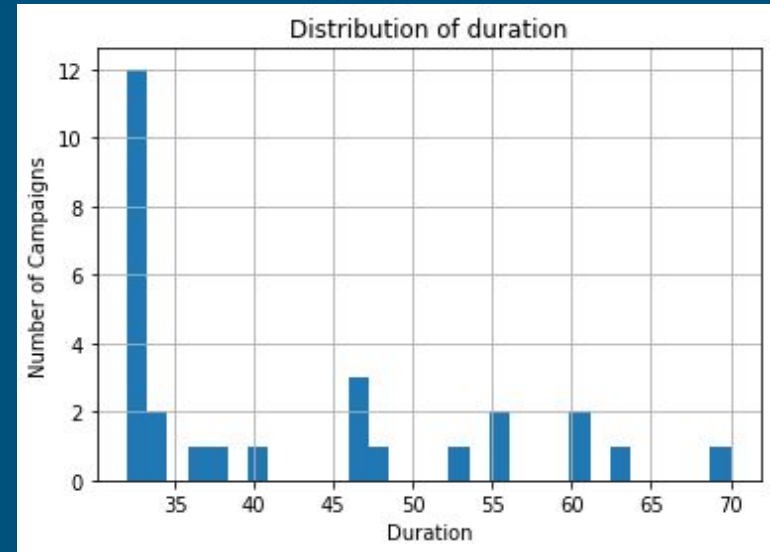
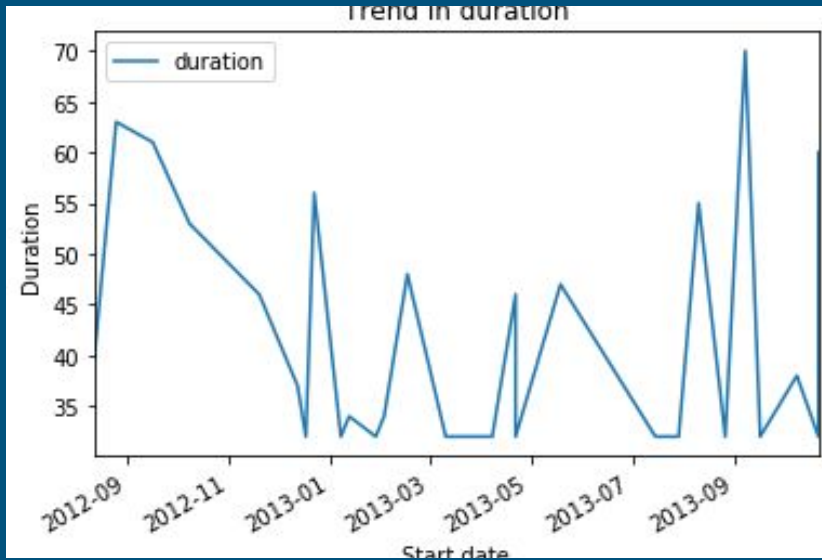
85% customers has never redeemed any coupons



0.93% campaign, coupon and customer combination has positive redemption status



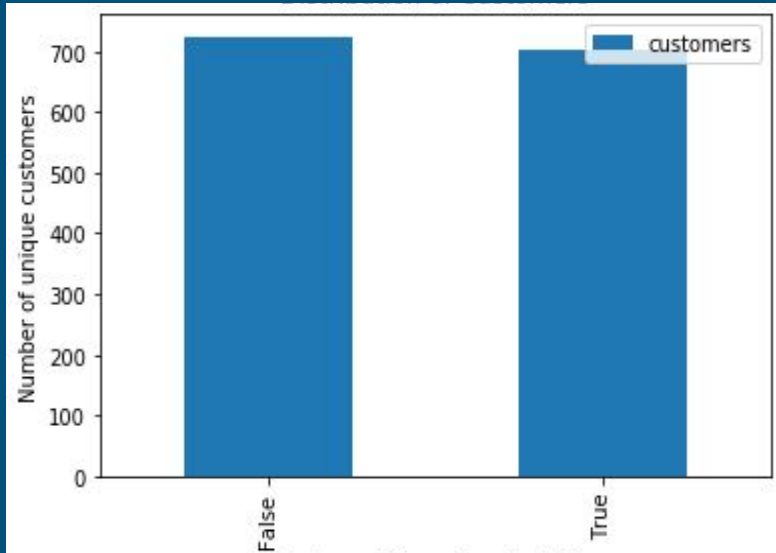
# Analysis: Campaigns



- Longer Campaigns in start
- Later on introduced campaigns with 35 or less days

- One Campaign of 70 days

# Analysis: Customer's Information



- 50% Customer's information is not available

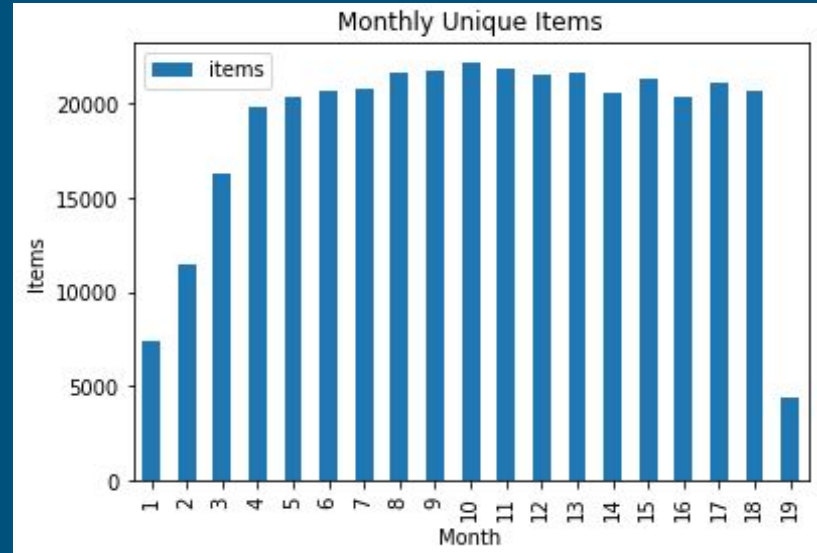


- Customers with information redeems more coupons than customers without any information

# Analysis: Customer Transactions

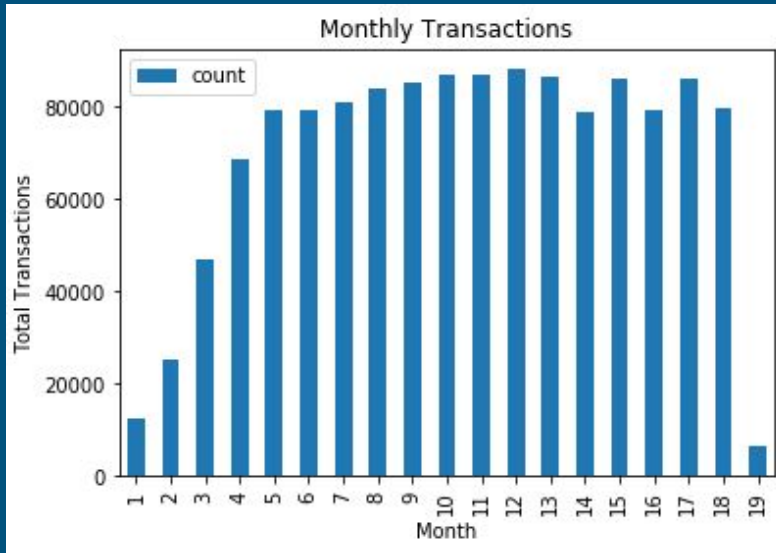


- Not much transaction in the initial 3 months



- Thereafter, Customers and Items remains almost stable

# Analysis: Customer Transactions *(continued)*



- Total transactions also remained stable after initial 3 months



- Transactions with coupon discount has fluctuations

Thank You