

Credit Card Classification Project

Machine Learning



IRON
HACK



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Scenario

The bank that hired us wants to understand the demographics and other characteristics of its customers that accept or decline a credit card offer.

Based on the result of this study the bank will be able to create tailored marketing campaigns for specific clusters within their customer base.



Luis

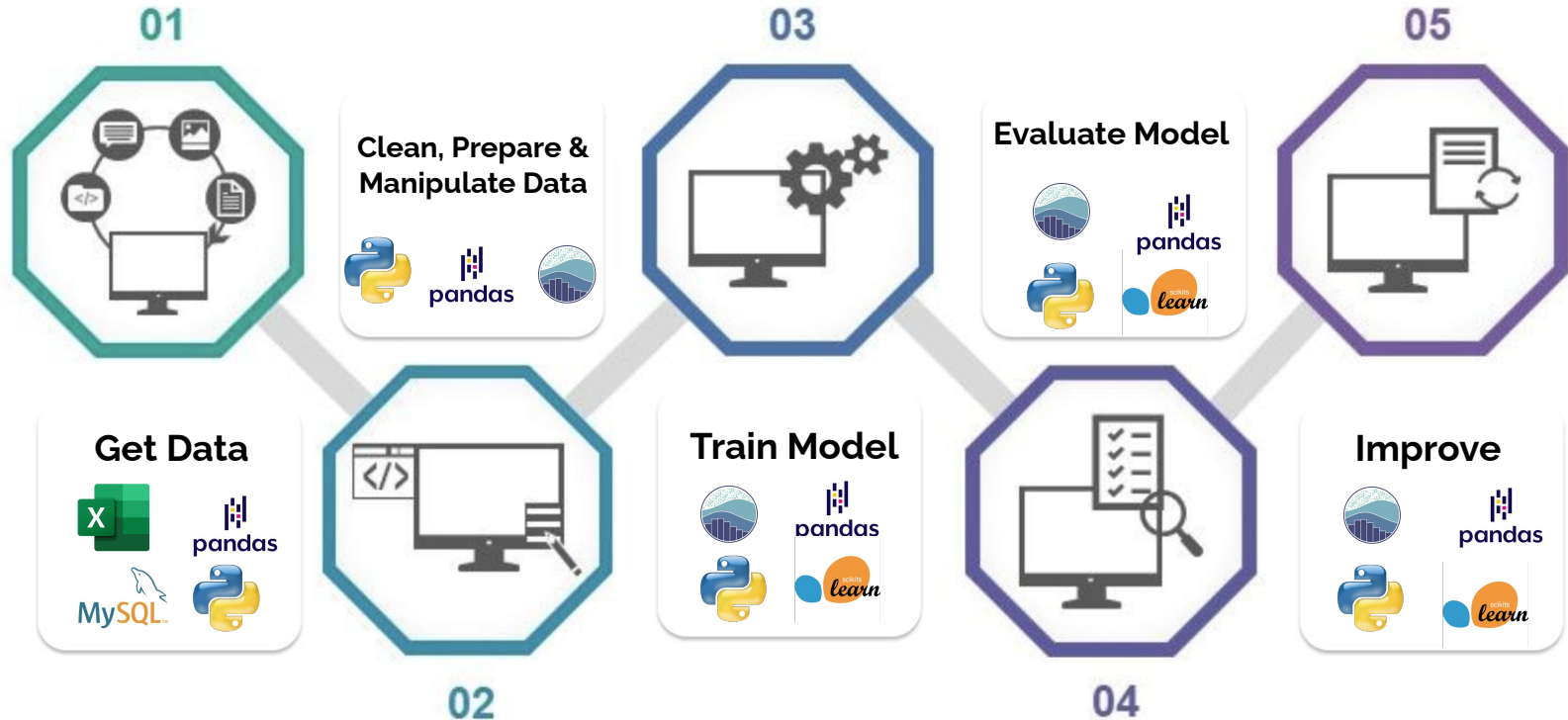
Senior Data Analyst



Pol

Data Analyst

Process



Model Comparison

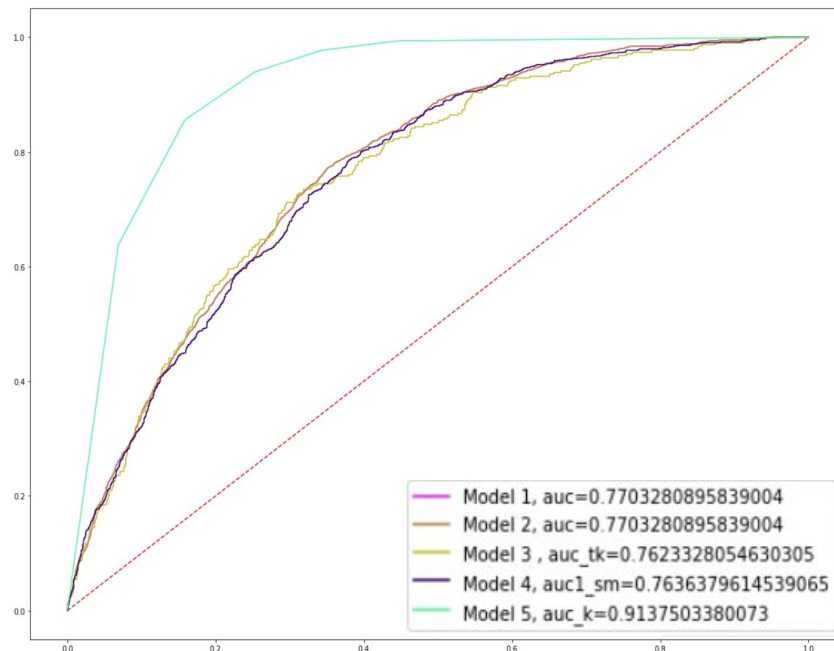
Baseline - SMOTE - TomekLink - Dropping Q Balances - KNN

Accuracy score

- **Model 1:** 0.9415909512330799
- **Model 2:** 0.6994003735377962
- **Model 3:** 0.9409403669724771
- **Model 4:** 0.7027425538189325
- **Model 5:** 0.8471444018480291

TP/TN - True Negatives / True Positives

- **Model 1:** TN: 94.16% | TP: 0.00%
- **Model 2:** TN: 33.50% | TP: 36.44%
- **Model 3:** TN: 94.09% | TP: 0.00%
- **Model 4:** TN: 33.48% | TP: 36.79%
- **Model 5:** TN: 36.35% | TP: 47.87%



Model Applied

Normalizer - SMOTE - KNN

```
## Importing KNeighborsClassifier
from sklearn.neighbors import KNeighborsClassifier

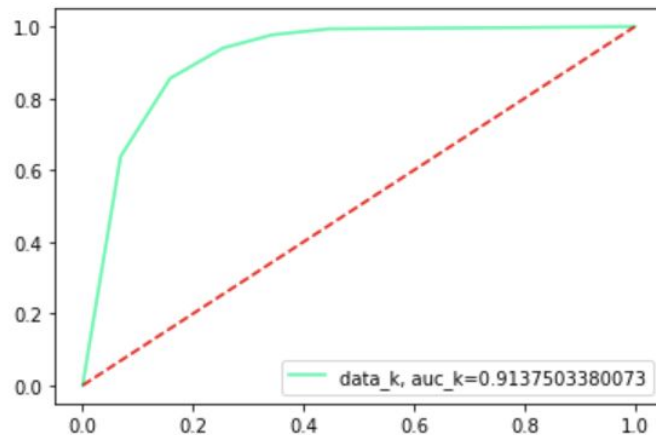
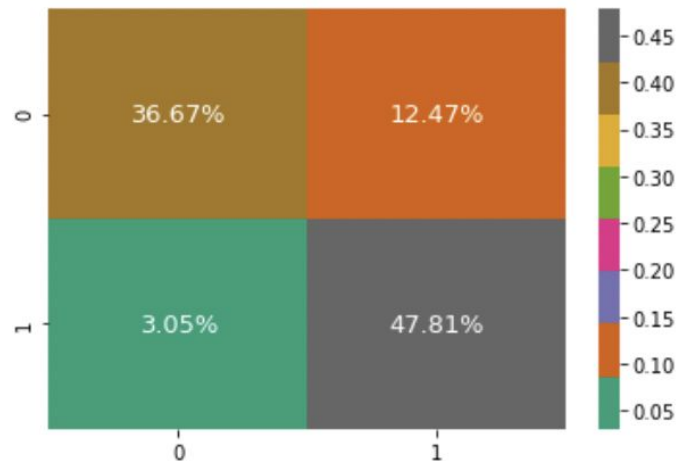
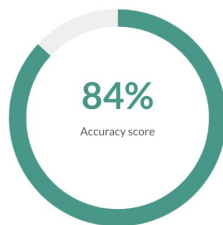
## Defining Knn giving it 5 neighbours
Knn = KNeighborsClassifier(n_neighbors = 5, p = 2)

## Splitting data into train and test set
X1_sm_train, X1_sm_test, y1_sm_train, y1_sm_test =
train_test_split(X1_sm, y1_sm, test_size = 0.3, random_state=40)

## Fitting Knn to the training sets
Knn.fit(X1_sm_train, y1_sm_train)

## Predicting the response for the new smote test dataset using Knn
y_pred_k = Knn.predict(X1_sm_test)

## Obtaining the accuracy of the prediction
accuracy_score(y1_sm_test, y_pred_k)
```

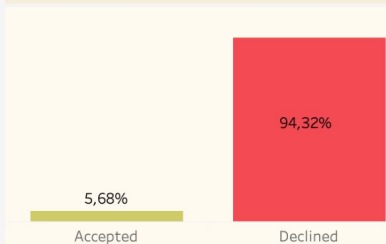


Visualizations



Credit Card Classification

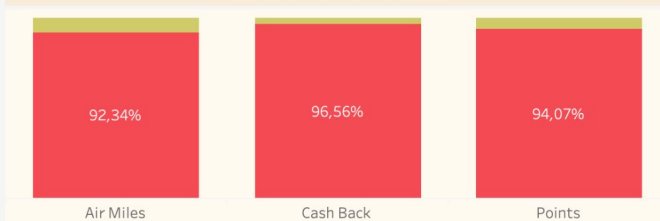
Offer accepted by Customer



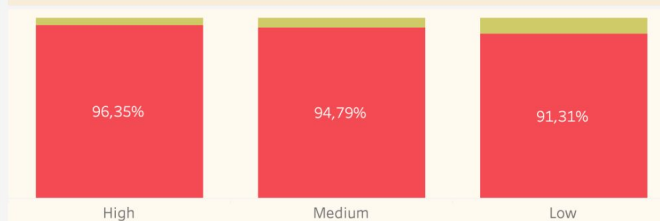
Offer Accepted vs Quarterly Avg Balance



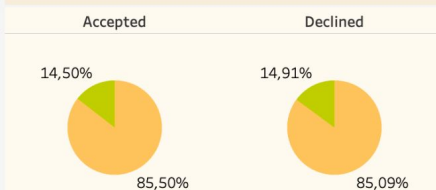
Reward vs Offer Accepted



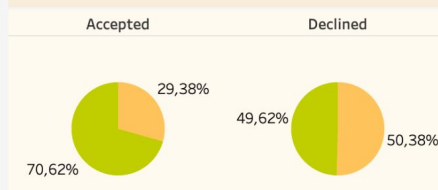
Income Level vs Offer Accepted



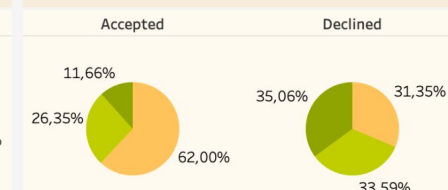
Offer Accepted vs Overdraft Protection



Offer Accepted vs Mailer Type



Offer Accepted vs Credit Rating

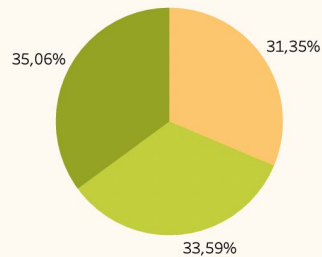
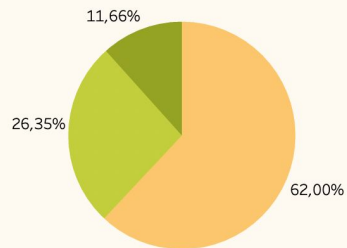


Visualizations

Offer Accepted vs Credit Rating

Accepted

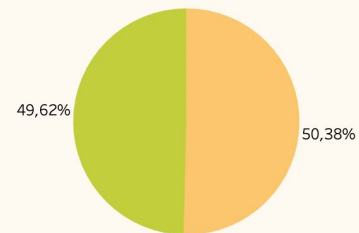
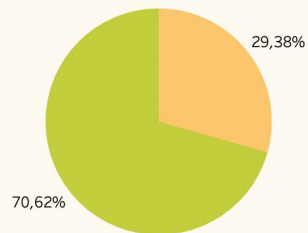
Declined



Offer Accepted vs Mailer Type

Accepted

Declined



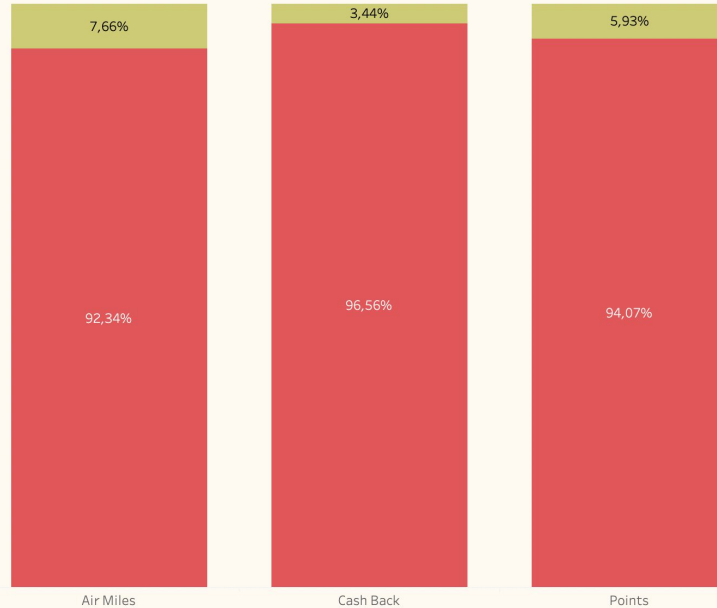
Visualizations

Offer Accepted

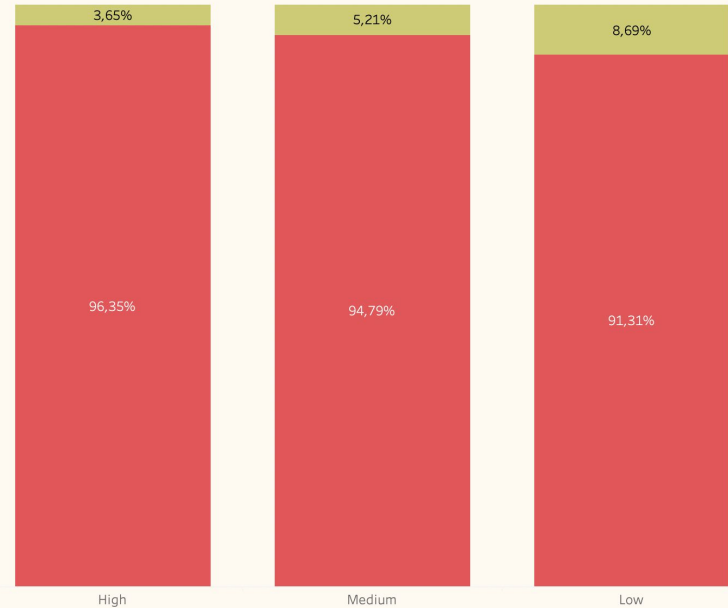
Accepted

Declined

Reward vs Offer Accepted



Income Level vs Offer Accepted



Thank you!