Tour Packages Sales Predicting Model

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Problem Description

The travel agency is suffering from low number of sales despite the resources directed on pitch sales.

This presentation aims to:

- Explore any patterns regarding the success or fail of a sale pitch
- Build a predictive model for future customers

01

Tools

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Dataset

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Findings

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Data Model

01

Tools

Tools

Jupyter Notebook

Data Processing

Numpy, Pandas

Vizualization

Matplotlib and Seaborn

Modeling

imblearn and sickit-learn

02

Dataset

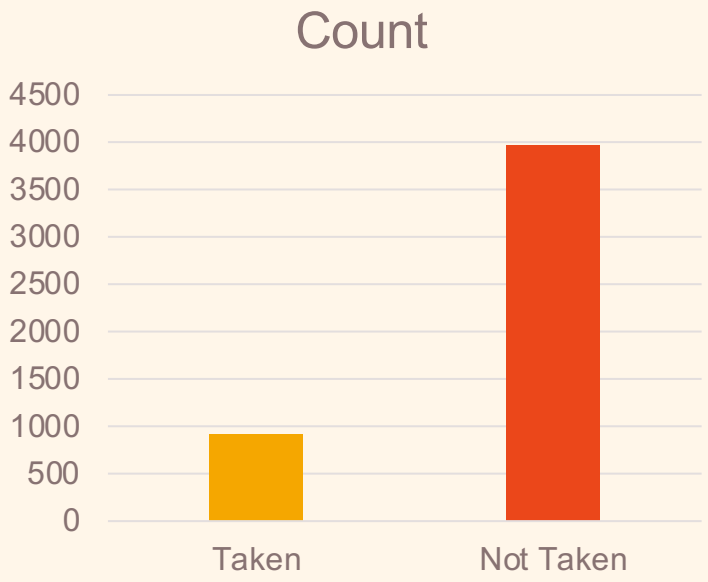
- The data set is made of 4888 rows and 20 columns.
- The dataset consists of different datatypes and is a mix of ordinal, categorical and continuous data
- The data covers information both about the customer and the sale pitch interaction

```
 #   Column
---  ------
 0   CustomerID
 1   ProdTaken
 2   Age
 3   TypeofContact
 4   CityTier
 5   DurationOfPitch
 6   Occupation
 7   Gender
 8   NumberOfPersonVisiting
 9   NumberOfFollowups
 10  ProductPitched
 11  PreferredPropertyStar
 12  MaritalStatus
 13  NumberOfTrips
 14  Passport
 15  PitchSatisfactionScore
 16  OwnCar
 17  NumberOfChildrenVisiting
 18  Designation
 19  MonthlyIncome
dtypes: float64(7), int64(7),
memory usage: 763.9+ KB
```

03

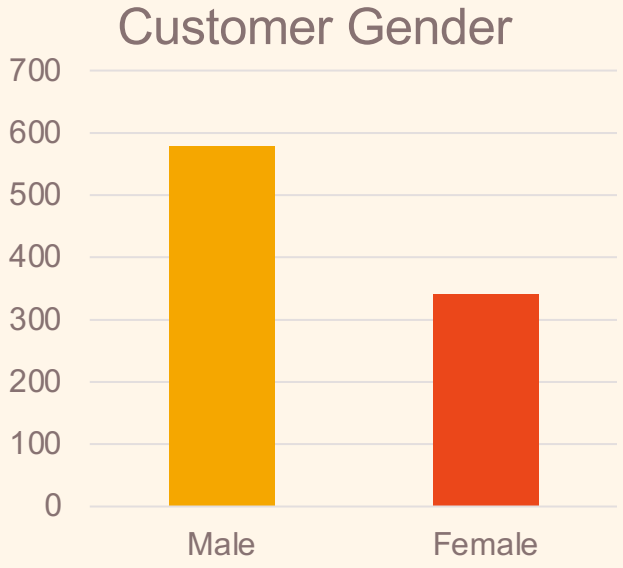
Findings

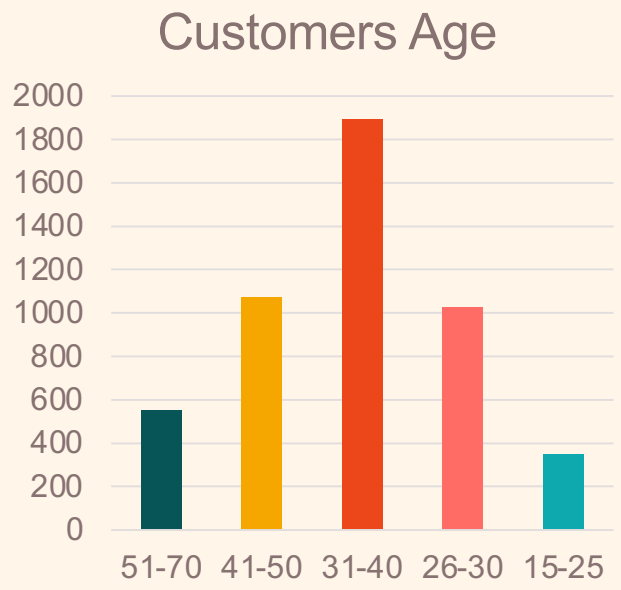
Products Taken



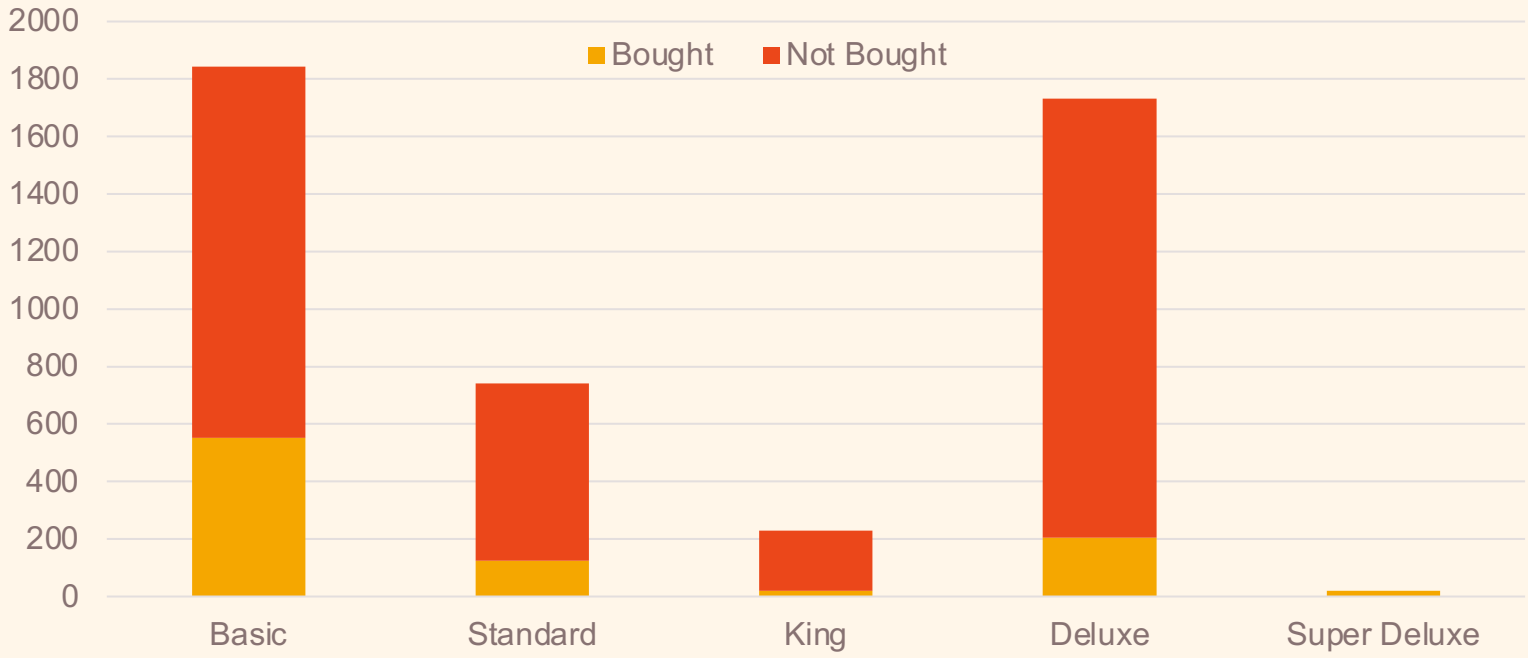
- We notice very low number of sales, indicating big amount of wasted time and resources

Personal Profile of Customers





Products pitched vs. Products Bought



04

Data Model

Testing Plan

Data

- Clean data
- Clean data + Oversampling
- Clean data +oversampling + feature selection

Over Sampling

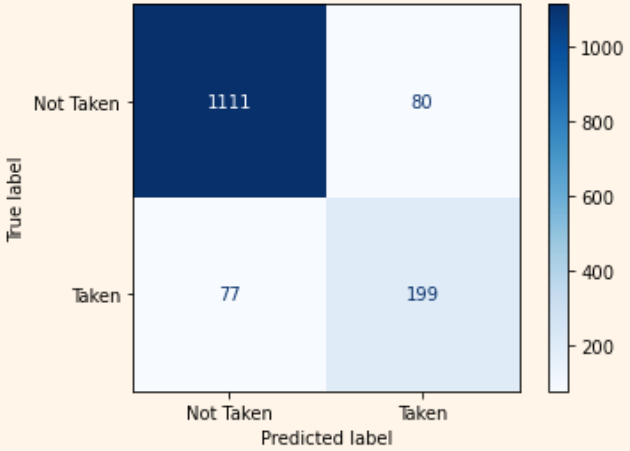
- SMOTE
- RandomOver Sampler

Classification

- Random Forest
- Logistic Regression
- XGBoost
- AdaBoost

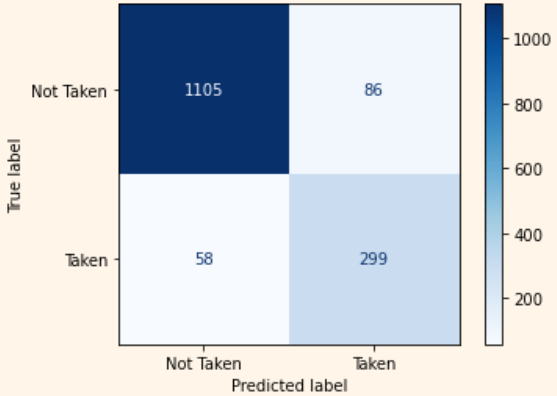
Testing (Clean Data)

- Testing on Clean Data resulted in high accuracy 90% . The Recall was at 72%.

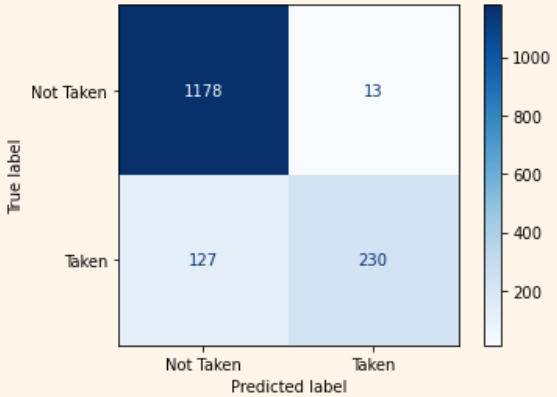


Testing (Over Sampling)

- Mixed and matched Oversampling algorithms with different classification models
- RandomOverSampler performed better than SMOTE, with higher recall, accuracy and lower False negatives and false positives



RandomOverSampler + Random Forest



SMOTE+ Random Forest

RESULTS

Model	Acuuracy	Recall	Percision	F1
Decision Tree	91%	84%	77%	80%
Random Forest	91%	73%	93%	82%
XGBoost	86%	55%	81%	60%
AdaBoost	83%	45%	73%	55%
Logistic Regression	80%	13%	86%	23%

- Data was skewed so we needed to Over Sample
- RandomOverSampler outperformed SMOTE
- Random Forest produced the highest accuracy

Thank you for Listening