AirlineChurn | ML Module

Notebook Input Output Logs Comments (0)

Competition Notebook
Aviakompaniya

In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.compose import ColumnTransformer
from sklearn.preprocessing import OneHotEncoder
from sklearn.preprocessing import StandardScaler
from sklearn.pipeline import Pipeline
from sklearn.ensemble import RandomForestClassifier


import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))
```

```
/kaggle/input/aviakompaniya/sample_submission.csv
/kaggle/input/aviakompaniya/train_dataset.csv
/kaggle/input/aviakompaniya/test_dataset.csv
```

After installing the dependencies, it is time to import the TrainSet

In [2]:
```
train_set=pd.read_csv('/kaggle/input/aviakompaniya/train_dataset.csv')
train_set.head()
```

Out[2]:

	id	Gender	Customer Type	Age	Type of Travel	Class	Flight Distance	Inflight wifi service	Departure/Arrival time convenient	Ease of Online booking	...	Inflight entertainment	On-board service	Leg room service	Bagg handl
0	1	Male	disloyal Customer	33	Business travel	Eco	571	2	3	2	...	4	3	1	3
1	2	Female	Loyal Customer	49	Business travel	Business	1431	4	1	4	...	5	5	5	5
2	3	Female	Loyal Customer	43	Business travel	Eco	867	1	4	4	...	1	1	1	1
3	4	Female	Loyal Customer	27	Business travel	Business	1550	3	3	3	...	2	4	4	5
4	5	Male	Loyal Customer	11	Personal Travel	Eco	526	3	4	3	...	4	5	2	5

5 rows × 24 columns

Gettin the info about the TrainSet

In [3]:
```
train_set.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10000 entries, 0 to 9999
Data columns (total 24 columns):
 #   Column                            Non-Null Count  Dtype
---  ------                            --------------  -----
 0   id                                10000 non-null  int64
 1   Gender                            10000 non-null  object
 2   Customer Type                     10000 non-null  object
 3   Age                               10000 non-null  int64
 4   Type of Travel                    10000 non-null  object
 5   Class                             10000 non-null  object
 6   Flight Distance                   10000 non-null  int64
 7   Inflight wifi service             10000 non-null  int64
 8   Departure/Arrival time convenient 10000 non-null  int64
 9   Ease of Online booking            10000 non-null  int64
 10  Gate location                     10000 non-null  int64
 11  Food and drink                    10000 non-null  int64
 12  Online boarding                   10000 non-null  int64
 13  Seat comfort                      10000 non-null  int64
 14  Inflight entertainment            10000 non-null  int64
 15  On-board service                  10000 non-null  int64
 16  Leg room service                  10000 non-null  int64
 17  Baggage handling                  10000 non-null  int64
 18  Checkin service                   10000 non-null  int64
 19  Inflight service                  10000 non-null  int64
 20  Cleanliness                       10000 non-null  int64
 21  Departure Delay in Minutes        10000 non-null  int64
 22  Arrival Delay in Minutes          9972 non-null   float64
```

In [4]:

```
train_set.describe()
```

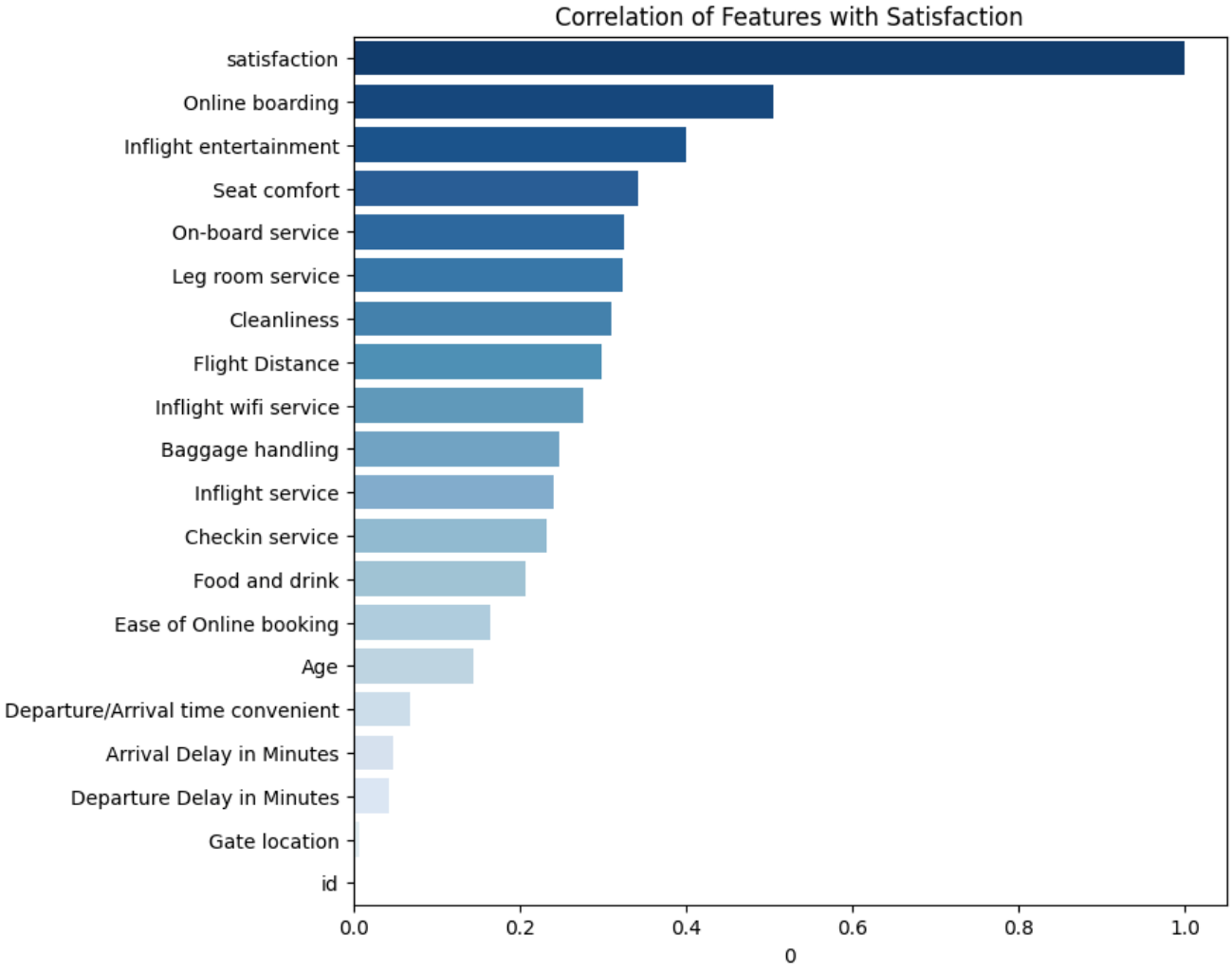
Out[4]:

	id	Age	Flight Distance	Inflight wifi service	Departure/Arrival time convenient	Ease of Online booking	Gate location	Food and drink	Online boarding
count	10000.00000	10000.000000	10000.000000	10000.000000	10000.000000	10000.000000	10000.000000	10000.000000	10000.000000
mean	5000.50000	39.375100	1229.556200	2.780200	3.065100	2.797800	2.981000	3.214500	3.349100
std	2886.89568	14.897959	1022.281958	1.362745	1.527316	1.421168	1.283278	1.333217	1.352779
min	1.00000	7.000000	31.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000
25%	2500.75000	27.000000	421.000000	2.000000	2.000000	2.000000	2.000000	2.000000	2.000000
50%	5000.50000	40.000000	863.500000	3.000000	3.000000	3.000000	3.000000	3.000000	4.000000
75%	7500.25000	51.000000	1806.750000	4.000000	4.000000	4.000000	4.000000	4.000000	4.000000
max	10000.00000	80.000000	4983.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000

Showing the correlation with visualization

In [5]:

```
corr = train_set.corrwith(train_set['satisfaction'], numeric_only=True).abs().sort_values(ascending=Fals
e)
plt.figure(figsize=(8,8))
sns.barplot(x=corr.to_frame()[0],y=corr.to_frame().index, palette='Blues_r')
plt.title('Correlation of Features with Satisfaction')
plt.show()
```



Dropping some columns with lower correlation

In [6]:
```
train_set.drop(['id','Gate location','Departure Delay in Minutes','Arrival Delay in Minutes'], axis=1, in
place=True)
train_set.head(2)
```

Out[6]:

	Gender	Customer Type	Age	Type of Travel	Class	Flight Distance	Inflight wifi service	Departure/Arrival time convenient	Ease of Online booking	Food and drink	Online boarding	Seat comfort	Inflight entertainment	On-boarc servi
0	Male	disloyal Customer	33	Business travel	Eco	571	2	3	2	4	2	4	4	3
1	Female	Loyal Customer	49	Business travel	Business	1431	4	1	4	3	5	4	5	5

Splitting the TrainSet into X and y variables

In [7]:
```
X=train_set.drop('satisfaction', axis=1)
y=train_set['satisfaction']
```

Writing a function to have a balanced data

In [8]:
```
def data_prep(X):

  nums=['Age', 'Flight Distance', 'Inflight wifi service', 'Departure/Arrival time convenient', 'Ease of
Online booking', 'Food and drink', 'Online boarding', 'Seat comfort', 'Inflight entertainment', 'On-board
service', 'Leg room service', 'Baggage handling', 'Checkin service', 'Inflight service', 'Cleanliness']
  cats=['Gender', 'Customer Type', 'Type of Travel', 'Class']

  num_pipeline=Pipeline([
    ('scaler', StandardScaler())
    ])

  full_pipeline=ColumnTransformer([
    ('num', num_pipeline, nums),
    ('cat', OneHotEncoder(handle_unknown='ignore'), cats)
    ])
  train_set_pred=full_pipeline.fit_transform(X)

  return train_set_pred
```

Modifying the data with the function

In [9]:
```
train_set_pred=data_prep(X)
train_set_pred
```

Out[9]:
```
array([[-0.42793906, -0.64423433, -0.57254957, ...,  0.        ,
         1.        ,  0.        ],
       [ 0.64608723,  0.19706293,  0.89514992, ...,  1.        ,
         0.        ,  0.        ],
       [ 0.24332737, -0.35467155, -1.30639932, ...,  0.        ,
         1.        ,  0.        ],
       ...,
       [ 0.4447073 ,  0.2058672 ,  0.16130017, ...,  1.        ,
         0.        ,  0.        ],
       [ 0.10907408, -1.11477384,  0.89514992, ...,  1.        ,
         0.        ,  0.        ],
       [ 0.10907408,  0.50619075,  0.16130017, ...,  1.        ,
         0.        ,  0.        ]])
```

Importing the TestSet and filling missing values

In [10]:
```
test_set=pd.read_csv('/kaggle/input/aviakompaniya/test_dataset.csv')
test_set['Arrival Delay in Minutes'].fillna(test_set['Arrival Delay in Minutes'].mean(), inplace=True)
```

Modifying the TestSet with the function

In [11]:
```
test_set_pred=data_prep(test_set)
test_set_pred
```

Out[11]:
```
array([[-1.00949875,  1.4675743 , -0.55639009, ...,  0.        ,
         1.        ,  0.        ],
       [ 0.61798677,  0.40000693, -1.28062061, ...,  1.        ,
         0.        ,  0.        ],
       [ 0.75361056, -0.86902552,  0.89207093, ...,  1.        ,
         0.        ,  0.        ],
       ...,
       [-0.1279441 , -0.60830601, -0.55639009, ...,  0.        ,
         1.        ,  0.        ],
       [-1.14512254, -0.23697823,  1.61630145, ...,  0.        ,
         1.        ,  0.        ],
       [-1.00949875, -0.13032025,  0.16784042, ...,  0.        ,
         1.        ,  0.        ]])
```

ML Process with RandomForestClassifier

In [12]:
```
forest_model = RandomForestClassifier(n_estimators=100, random_state=42)
forest_model.fit(train_set_pred, y)
```

Out[12]:

▾ RandomForestClassifier

RandomForestClassifier(random_state=42)

Predicting the module

In [13]:
```
y_pred=forest_model.predict(test_set_pred)
```

Transferring the predicted samples into Samples dataset

In [14]:
```
sample=pd.read_csv('/kaggle/input/aviakompaniya/sample_submission.csv')
sample['satisfaction']=y_pred
sample
```

1	2	1
2	3	1
3	4	1
4	5	0
...	...	...
3995	3996	1
3996	3997	0
3997	3998	0
3998	3999	1
3999	4000	0

4000 rows × 2 columns

Saving our ML Module

In [15]:
```
sample.to_csv('AirlineChurnSubmission.csv', index=False)
```