Description

PS I – Churn Risk Prediction

Problem statement

Churn rate is a marketing metric that describes the number of customers who leave a business over a specific time period. Every user is assigned a prediction value that estimates their state of churn at any given time. It factors in our unique and proprietary predictions of how long a user will remain a customer. This score is updated every day for all users who have a minimum of one conversion. The values assigned are between 1 and 5.

You need to help ABC Company, a client of Mu-sigma to predict the churn score for their website and identify the various drivers which can lean to a customer churn.

Data Description

train.csv: 36992 x 25

test.csv: 19919 x 24

Solution:

The first step was to determine the contributing attributes to the churn rate. From my analysis I found the key attributes which are contributing to the churn rate are:

- **Age, gender, region_category, membership_category, joined_through_referral, preferred_offer_types, medium_of_operation, internet_option, days_since_last_login, avg_time_spent, avg_transaction_value, avg_frequency_login_days, points_in_wallet, used_special_discount, offer_application_preference, past_complaint, complaint_status, feedback, churn_risk_score**

Next, I performed cleaning where I removed all the attributes which were not contributing to the data.

- **customer_id, Name, security_no, referral_id, joining_date, last_visit_time**

During data preparation the blank and unwanted values accounts to 10% of the data where I tried to preserve the data.

- Gender also had missing values so I classified it Unknown.

gender	
Male	1
Female	0
Unknown	2

- Region_category consists of blank values of 5428 rows. We classified these groups as:

region_category	
Village	0
Town	1
City	2
Unknown	3

- **Similarly, membership_category**

membership_category	
Platinum Membership	0
Premium Membership	1
No Membership	2
Gold Membership	3
Silver Membership	4
Basic Membership	5

- The **joining_through_referral** and **referral_id** had mismatched values. So, I came up with the logic if **referral_id** is given then **joining_through_referral** will be **No else Yes.**

joined_through_referral	
Yes	1
No	0

- The **medium_of_operation** had missing values I replaced the missing values with the mode of medium_of_operation after finding no relation between **internet_option.**

medium_of_operation	
Desktop	0
Smartphone	1
Both	2
internet_option	
Wi-Fi	0
Mobile_Data	1
Fiber_Optic	2

- **Feedback**

feedback	
Products always in Stock	0
Quality Customer Care	1
Poor Website	2
No reason specified	3
Poor Product Quality	4
Poor Customer Service	5
Too many ads	6
User Friendly Website	7
Reasonable Price	8

- **Preffered_offer_types**

preferred_offer_types	
Gift Vouchers/Coupons	0
Credit/Debit Card Offers	1
Without Offers	2

- **Used_special_discounts**

used_special_discount	
Yes	1
No	0

- **Offer_application_preference**

offer_application_preference	
Yes	1
No	0

- **Past_complaint**

past_complaint	
Yes	1
No	0

- **Complaint_status**

complaint_status	
Not Applicable	0
Solved	1
Solved in Follow-up	2
Unsolved	3
No Information Available	4

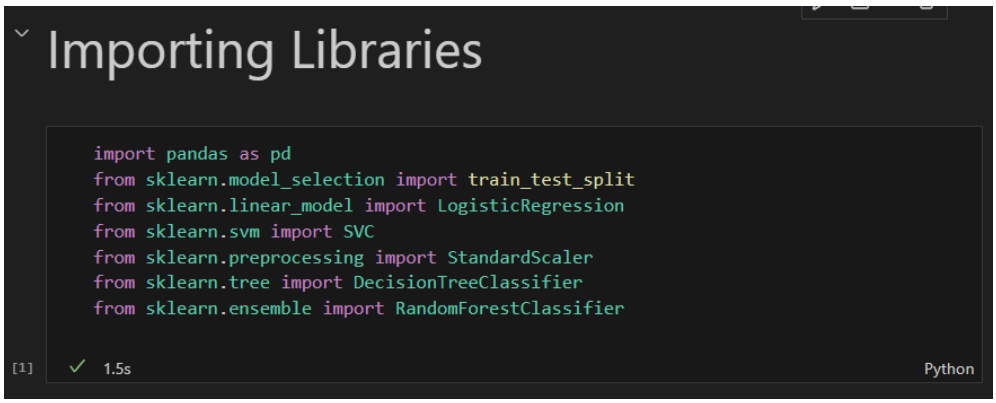
- **avg_frequency_login_days** consisted Error as a data point. So, changed it to **0**

Hence the data preparation was completed.

Prediction:

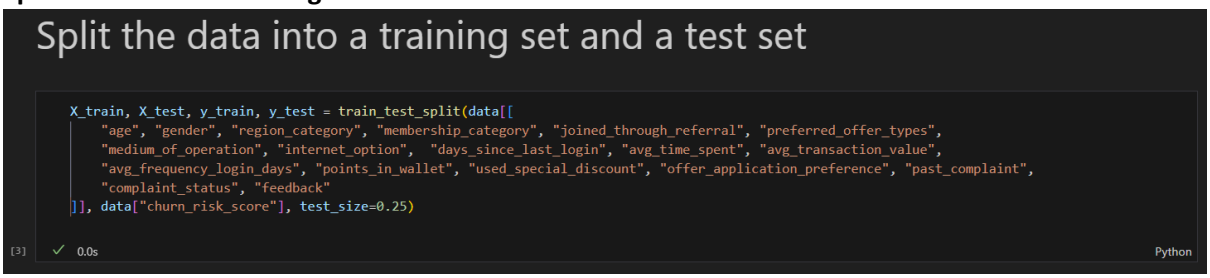
I applied machine learning for prediction on the test dataset.

1. **First step was to import the libraries.**

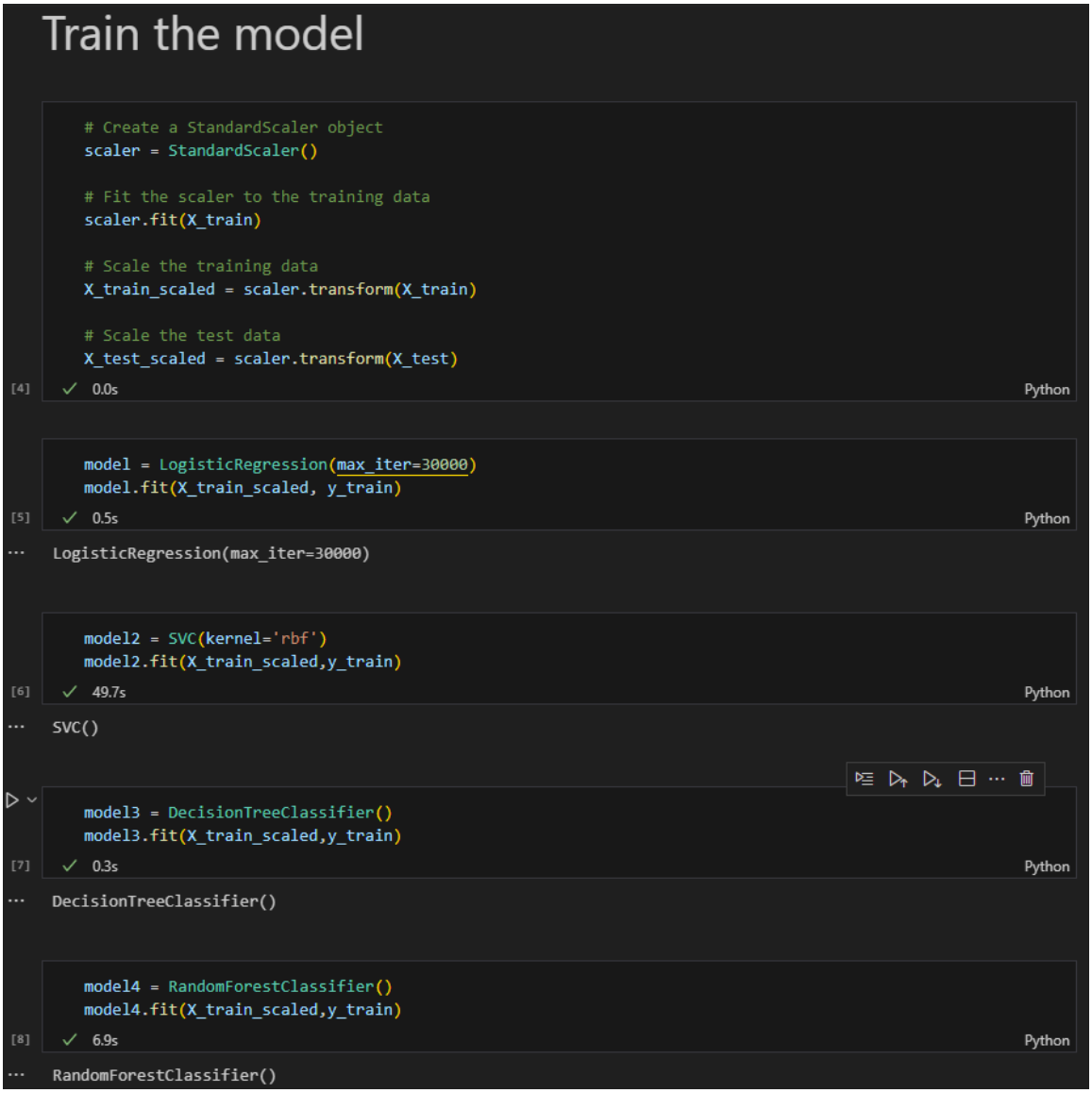


2. **Loading data**

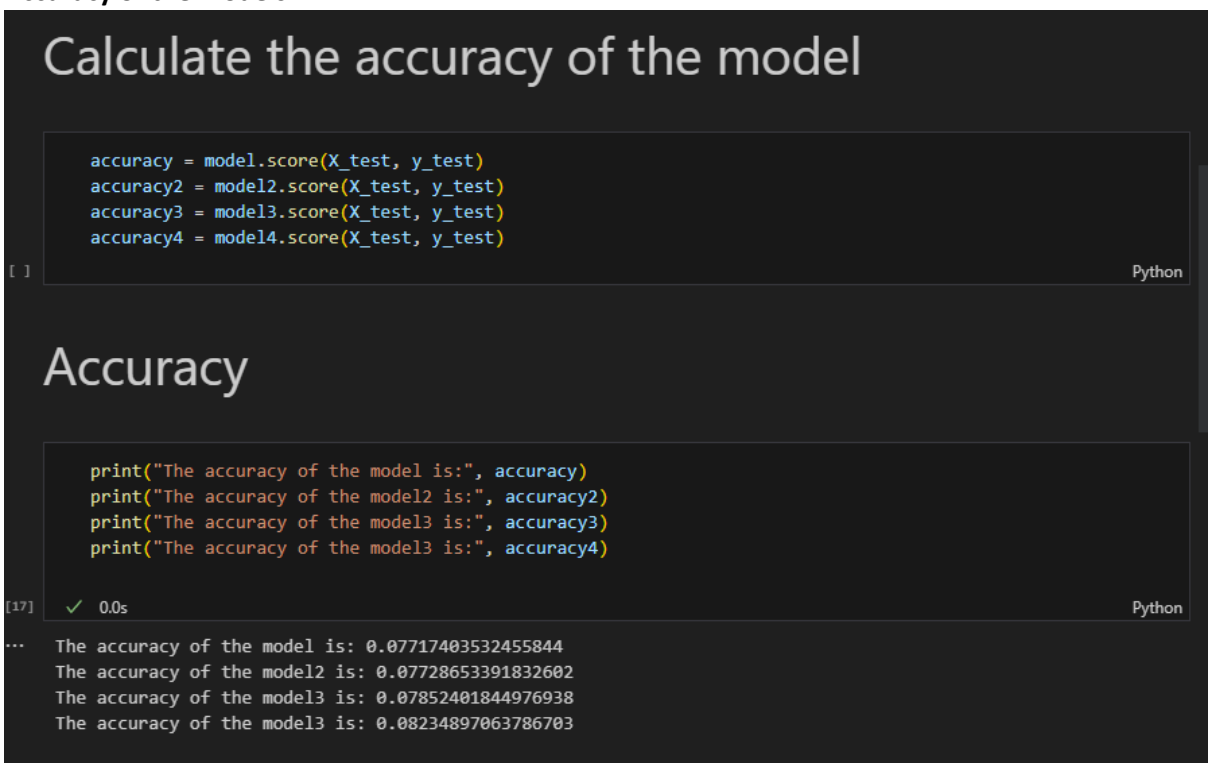
3. **Split the data into training set and a test set**



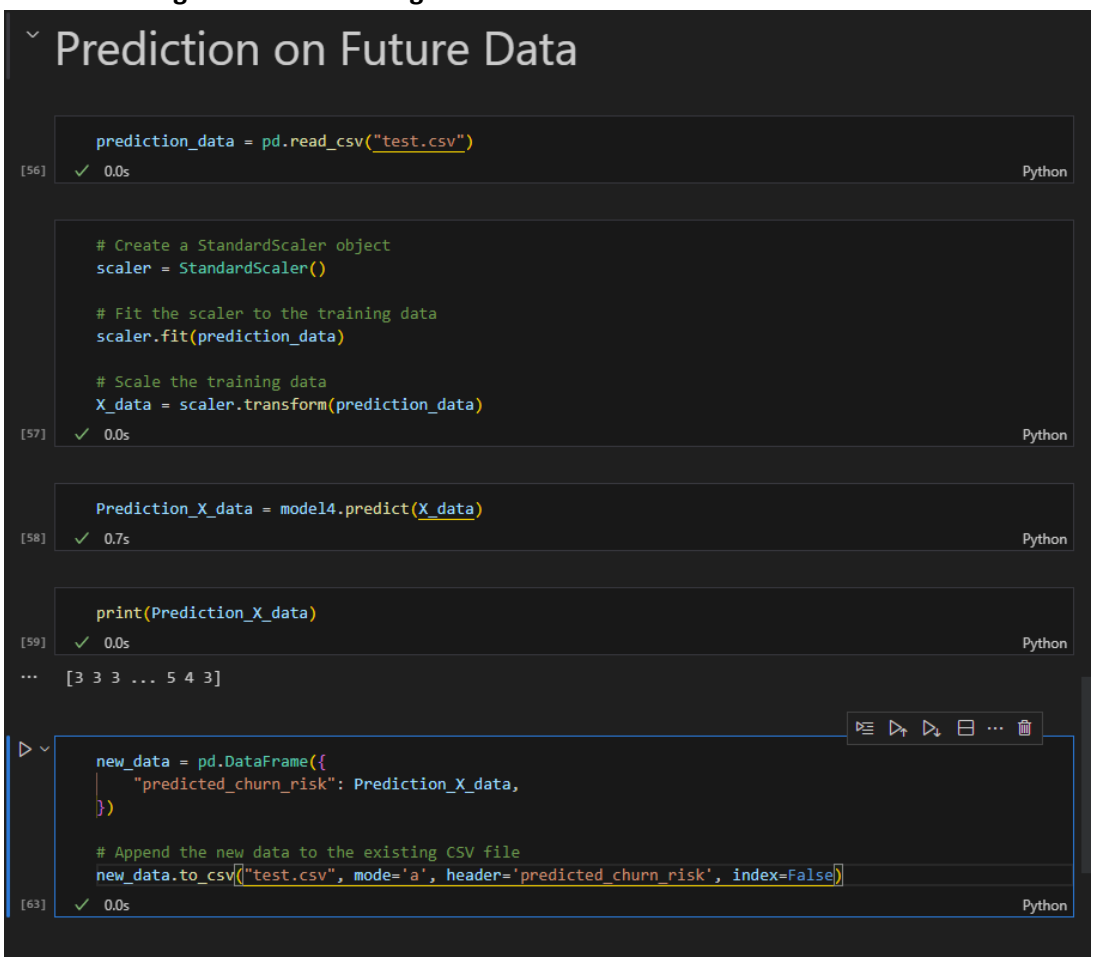
4. **Train the model and performed scaling on the input data**



5. **Accuracy of the models**



6. **Prediction on given test data using Random Forest Classifier**



To my curiosity, I used 4 different classifiers:

Model	Accuracy
1) Logistic Regression	**77.17**
2) Support Vector Machine	**77.28**
3) Decision Tree Classifier	**78.52**
4) Random Forest Classifier	**82.34**

Then used Random Forest Classifier to predict the churn rate on the **test.csv.**

Conclusion:

The churn rate score accuracy for companies depends on the specific industry and the company's specific goals. However, as a general rule of thumb, a churn rate score accuracy of 80% or higher is considered to be good. This means that for every 100 customers, the company is able to accurately predict that 80 of them will churn.

A churn rate score accuracy of 90% or higher is considered to be excellent. This means that for every 100 customers, the company is able to accurately predict that 90 of them will churn.

However, it is important to note that a higher churn rate score accuracy does not necessarily mean that the company is taking the right steps to prevent churn. For example, a company with a churn rate score accuracy of 90% may still be losing a significant number of customers.