

User Manual: Customer Analytics System

FIRST STEP

- Before following the steps mentioned below, please ensure that the dataset(Online_Retail.csv) and the jupyter notebook consisting of the code have been downloaded. Make sure that both files are downloaded into the same directory so that there will not be any errors with loading the dataset while running the code. Once they have been downloaded, you may proceed to the next steps that consist of setting up the environment to run the code.

Setting Up the Environment

a. On Google Colab

- i. Open Google Colab, by going to [Google Colab](#).
- ii. Once you have opened Colab, make sure you are logged into your email account so that the notebook will be safely saved to that account.
- iii. Then, you may upload the notebook by clicking on “File” in the top left corner of the website, select “Upload Notebook”, and then upload the downloaded notebook from your laptop downloads.
- iv. Once you have uploaded the notebook, you need to upload the dataset, which is the Online_Retail.csv file.
- v. Click on the folder icon in the left sidebar, then click on the upload icon to upload the file.
- vi. Make sure that required libraries are installed, but Colab has most libraries pre-installed. Just to make sure libraries are downloaded run this code in an empty cell: `!pip install ipywidgets matplotlib seaborn`
- vii. The command above is an example of how to download of the libraries.

b. On Jupyter Notebooks:

- i. Install Jupyter using: `pip install notebook`, if not installed already.
- ii. Place notebook and dataset Together if not done already. Move the .ipynb file and Online_Retail.csv into the same directory on your computer.
- iii. Open Jupyter Notebook by opening a terminal or Anaconda prompt and type: `jupyter notebook`
- iv. In the browser interface, select the uploaded notebook from the file list.
- v. Ensure the dataset path in the notebook code is correctly set to "Online_Retail.csv".

Running the Notebook:

1. Before we proceed with running the notebook, we need to make sure that all required and necessary libraries are installed. To do so, run the following command: `!pip install ipywidgets matplotlib seaborn`
2. The command above is to make sure that libraries are successfully installed prior to running the code.
3. Once downloading all necessary libraries, we run the code cells. As our project consists of all the code in a singular cell, running that one cell will be enough.
4. Once the cell is successfully executed, you will see the following interactive dashboard:

```

Loading and preprocessing data...
InvoiceNo StockCode Description Quantity \
0 536365 85123A WHITE HANGING HEART T-LIGHT HOLDER 6
1 536365 71053 WHITE METAL LANTERN 6
2 536365 84406B CREAM CUPID HEARTS COAT HANGER 8
3 536365 84029G KNITTED UNION FLAG HOT WATER BOTTLE 6
4 536365 84029E RED WOOLLY HOTTIE WHITE HEART. 6

InvoiceDate UnitPrice CustomerID Country
0 2010-12-01 08:26:00 2.55 17850.0 United Kingdom
1 2010-12-01 08:26:00 3.39 17850.0 United Kingdom
2 2010-12-01 08:26:00 2.75 17850.0 United Kingdom
3 2010-12-01 08:26:00 3.39 17850.0 United Kingdom
4 2010-12-01 08:26:00 3.39 17850.0 United Kingdom
Data preprocessing complete!
Initializing the system... Please wait.
Performing RFM analysis...
RFM analysis complete!
Training churn prediction model...
Churn model training complete!
precision recall f1-score support
0 1.00 1.00 1.00 448
1 1.00 1.00 1.00 427

accuracy 1.00 875
macro avg 1.00 875
weighted avg 1.00 875

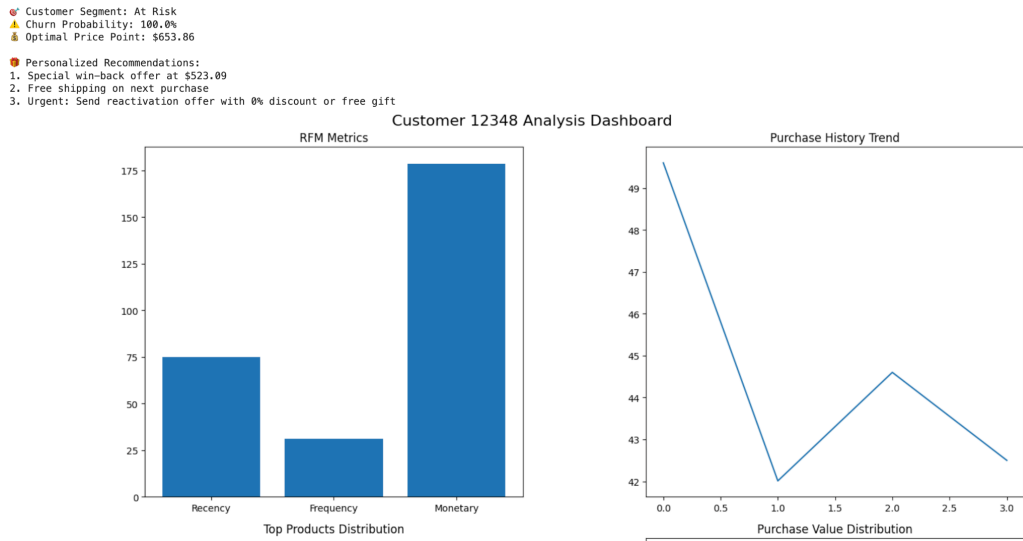
Training price optimization model...
Price model training complete! MSE: 5115629.902579789
System initialized successfully!

```

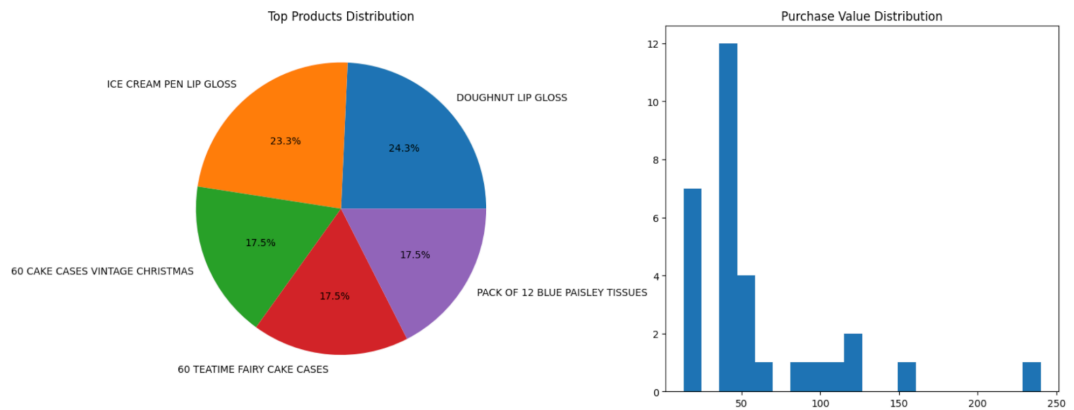
Customer Analytics Dashboard

a. Customer ID:

5. To generate the analytics for a certain customer, you need to input their CustomerID. Here is a sample output for one customer with customerid 12348:



a.



- b.
- c. Above, we see customer insights for CustomerID 12348. Their insights include what they have purchased, and if they are highly likely to stop purchasing from said company, then what incentives could be provided to them to ensure that they stay and shop with the company.
- d. If there are no visualizations present, then the error handling function prints out an error message that indicates that the customer does not have enough data/purchases made to create visualizations.

6. As the dataset used for this project is vast with thousands of CustomerIDs present, you may try with example CustomerIDs such as 17850 and 12346.

7. The `generate_recommendations` method can also be modified to your liking to change the type of recommendations that the customer may need based on the type of store/company that would be utilizing this model.

Debugging:

1. Ensure the dataset is in the correct format (CSV) and matches the column names used in the code (CustomerID, InvoiceDate, UnitPrice, Quantity, Description).
2. If you encounter missing libraries, use the `!pip install` command to install them.
3. If the dashboard is not displaying information, ensure ipywidgets is installed and properly enabled by running the following code in the notebook: `jupyter nbextension enable --py widgetsnbextension`
4. If dataset is not found, ensure that it is located in the directory the notebook is located in. Verify that uploaded files are accessible using the “ls” command.