Customer Behavior Prediction Model

Using RFM and Logistic Regression

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Bussiness Problem

Since marketing campaigns consume a lot of companies' resources, companies nowadays understand the importance of analyzing their customers' behavior and its impact on the campaign's success.

Therefore I decided to build a model that predicts the next purchase day of the customer, which will help companies prepare special offers to their customers based on their level.

Project steps

01 Find suitable dataset

02 Data Cleaning

03 Feature Engineering

04 Data Visualization

05 RFM method

06 Data Modeling

01

Data Describtion

The data used is an E-Commerce dataset from Kaggle, which contains actual transactions from UK retailers

Transactions period:	From 01/12/2010 to 09/12/2011
Number of features:	8
Number of observations:	541,908
Features data types:	**Categorical:** Invoice_Number , Stock_Code, Description, Invoice_Date, Country **Numerical:** Customer_ID ,Unit_Price, Quantity

02

Data Cleaning

Cleaning Process

Columns

- **Change data type:**

invoice Date to date time type.
customer ID to integer type.

- **Make columns names lowercased.**

Rows

- **Change ‘description’ to lower case.**

Handling Null and duplicates

Null Values

Description: 1454
Customer ID: 135080

Drop

Duplicated values

Number of duplicates: 5225

Drop

Cancelled orders

Zero quantity = Cancelled orders

Drop

03

Feature Engineering

New Features added

Feature Splitting

Invoice_date
2010-12-01 08:26:00

Invoice_date	year	month	day	hour
2010-12-01 08:26:00	2010	12	1	8

Creating Features

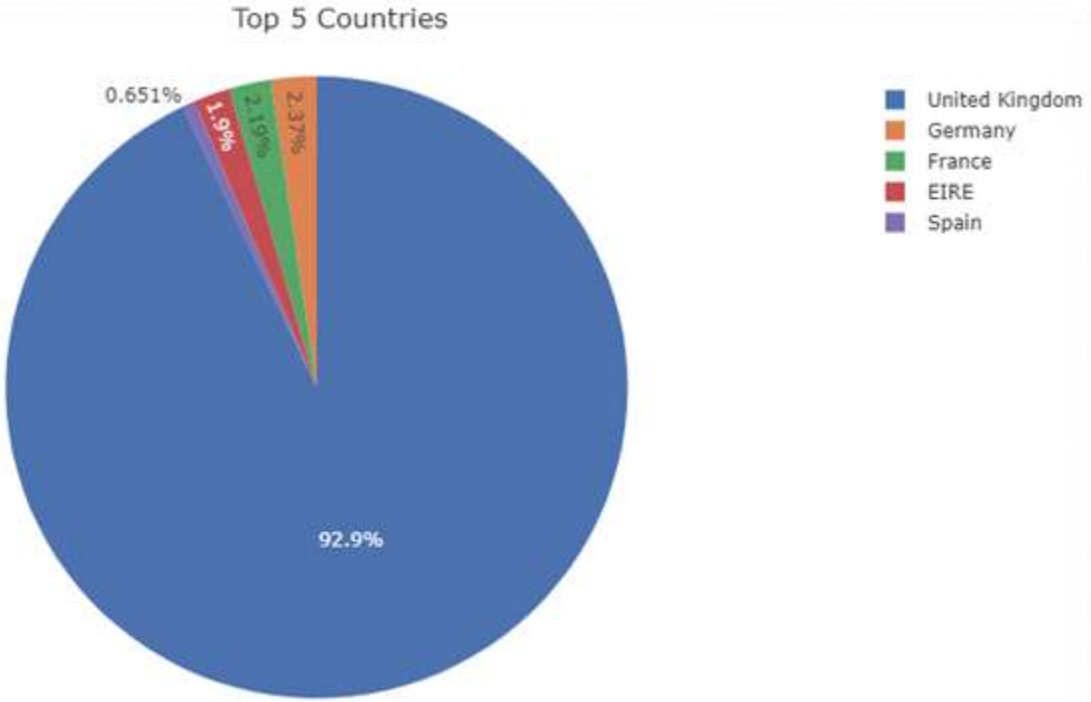
Quantity X Unit_Price

Total spent

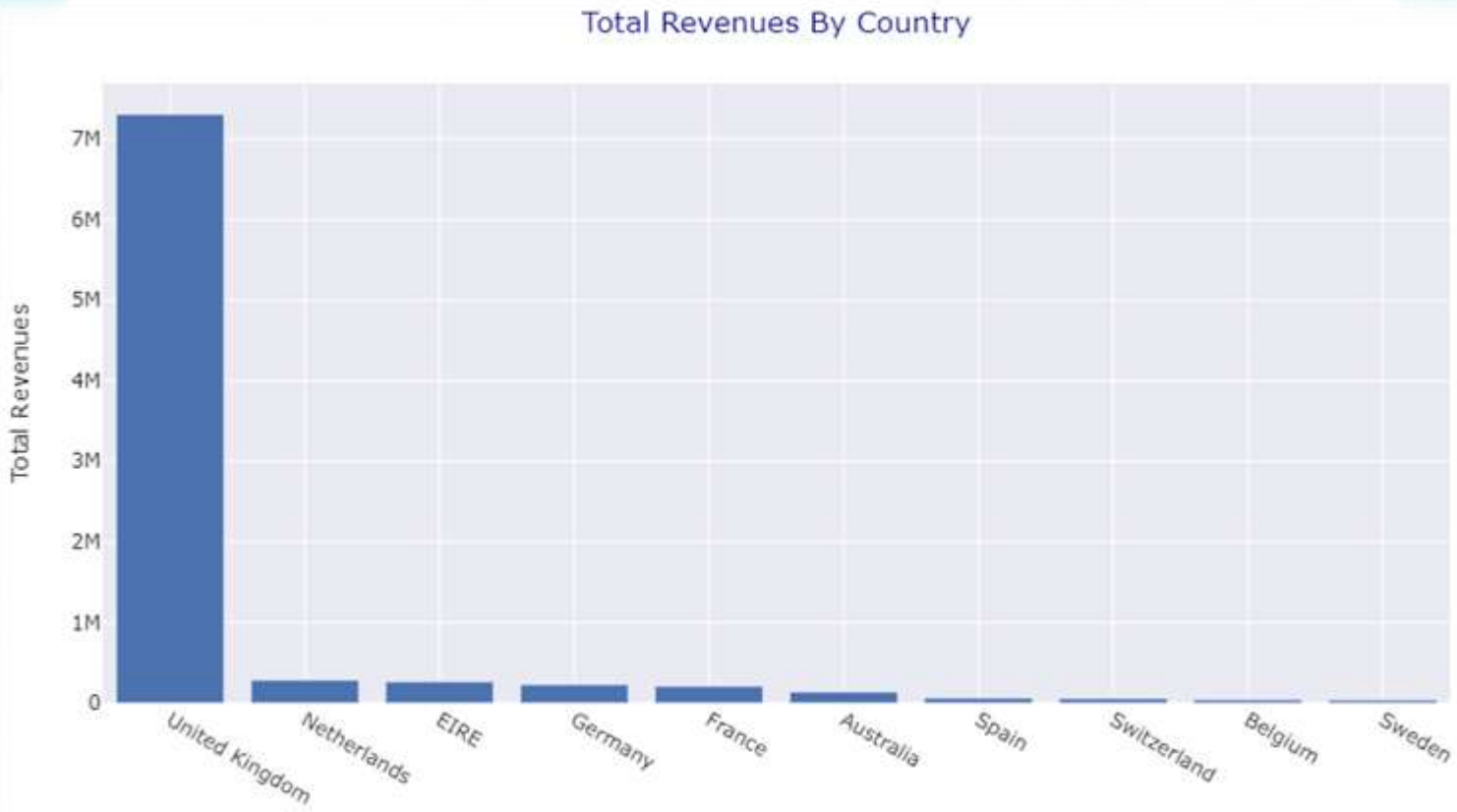
04

Data Visualization

Let’s answer some business questions



Which country with the highest number of customers?



Which countries with the highest revenues?

Which month ranked the highest revenues?

What time is the best for launching a new campaign/Advertisement?

05

RFM METHOD

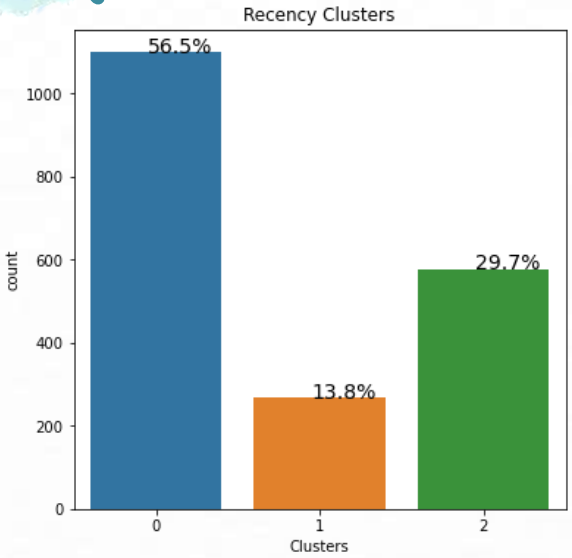
RFM (Recency, Frequency, Monetary) analysis
It is a customer segmentation technique that uses past purchase behavior to divide customers into groups!

RECENCY Days since last purchase

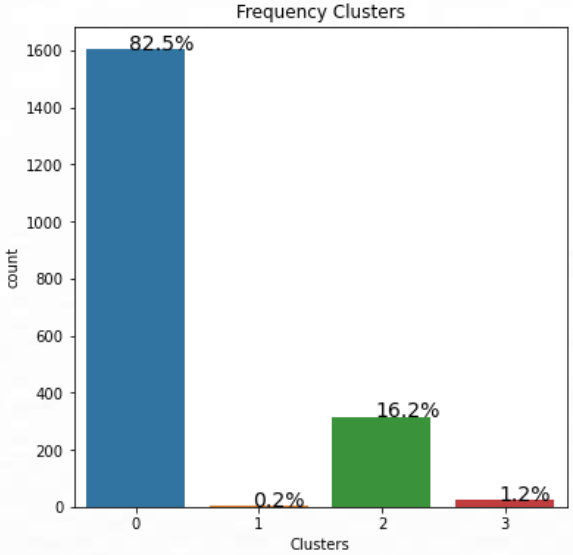
FREQUENCY Total number of purchases

MONETARY Total money this customer spent

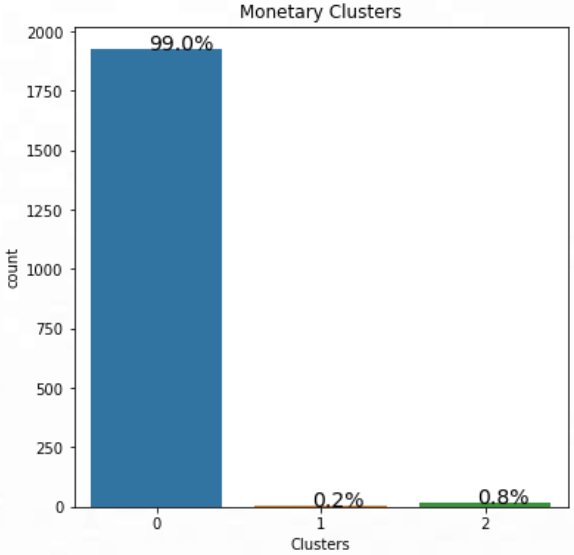
RFM Clusters



56% of the customers are active

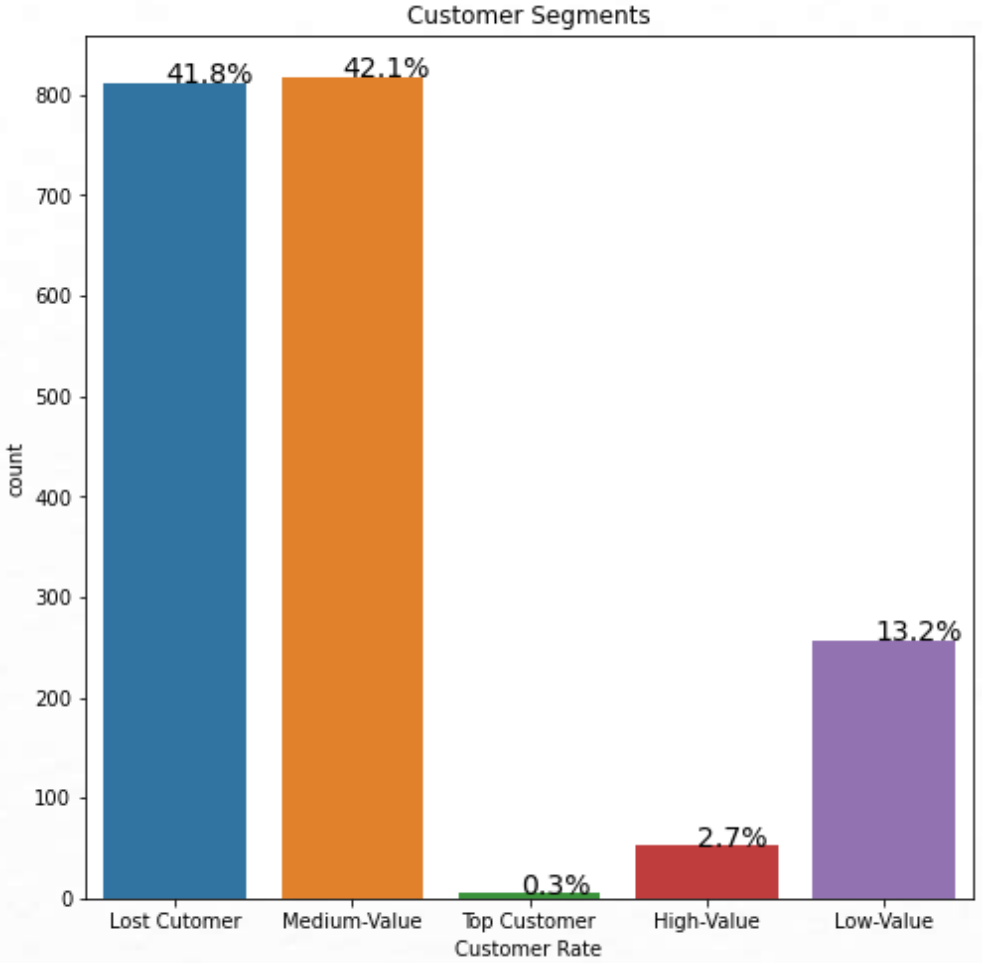


82% of the customers with few number of orders



99% of the customers spent the least

RFM Segmentation



06

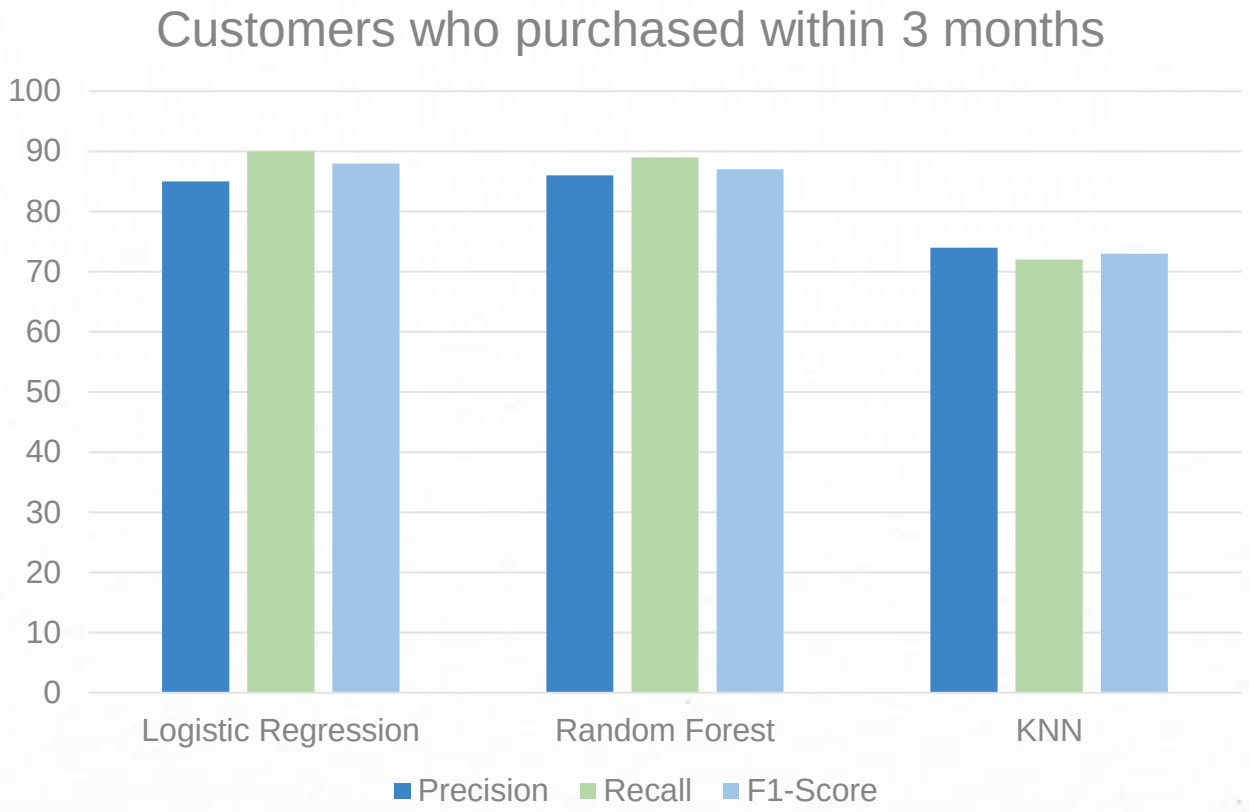
Data Modeling

Models used

My target

Day Range: it 0 if a customer took more than 3 months to purchase. It 1 if customer purchased within 3 months.

Model	Accuracy
Logistic Regression	88%
Random Forest	88%
KNN	75%



I chose logistic regression model, since it has the highest accuracy and F1-score!

Thank you!