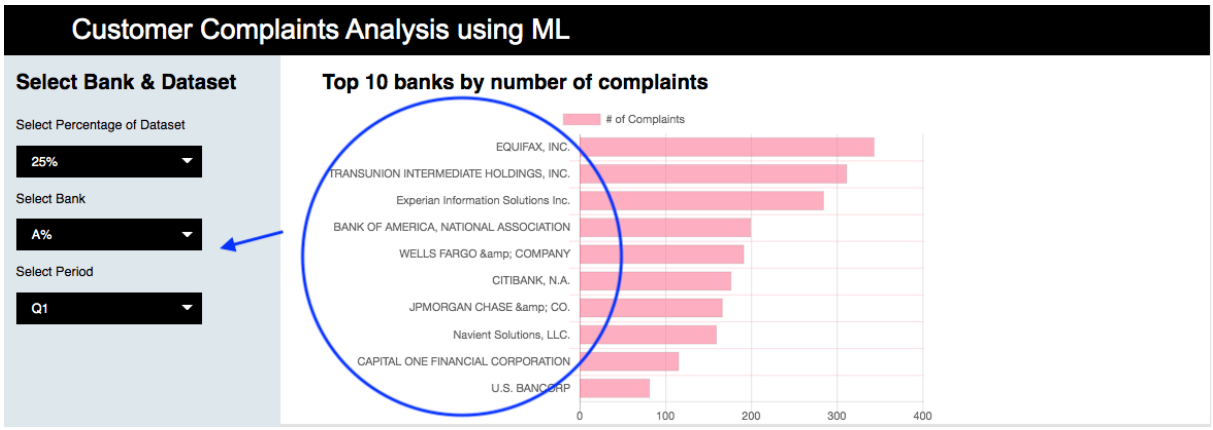
Question 1

Businesses are starting to adapt the use of Artificial Intelligence (AI) to perform repetitive or assist in complex decision making tasks where human would normally be required. In most of these cases, the outcome of these decisions or "classifications" made by AI are usually based on statistical probabilities that have a high degree of certainty.

Almost all of the AI systems today are using "machine learning" which essentially are computer programs that use algorithms that continuously read data, analyse them and computes decisions based on the statistical probabilities. The decisions made can then be used to help business to automate tasks and reduce the need for human interaction.

A leading financial services firm business department is embarking on an initiative to use machine learning to improve their customer service experience and have collaborated with the IT team to develop a POC Dashboard that can help them identify that are the top issues that are faced by their customers.

The following User Interface was suggested by the Project team that was setup to drive this initiative.



Applying only HTML & CSS, create the above Dashboard page as illustrated below using ONLY a *.html file and *.css file. You should create a folder (i.e. q1) and store the relevant resources accordingly in the subfolders (i.e. q1/img , q1/css). Create your own images for icons if required.

Do note that the dashboard page contains the following visual elements:

- a top menu with a side menu bar and a main content area

- 3 selection list on the side menu which list the following values
  → 25,50,75,100 %
  → A list of Bank names which are displayed on the chart. You can use the names on the chart diagram for the values in this selection list.

→ Q1, Q2, Q3, Q4 representing the quarterly period of a year

- a main content area
- a graph showing a bar chart listing out the # of complains receive by the firm from the various customers (financial companies) that they have received.

a) Create the required layout with the exact proportions show in the diagram for the Dashboard and the 3 sections:
- Top Menu Bar Area
- Side Navigation Bar area
- Content Area

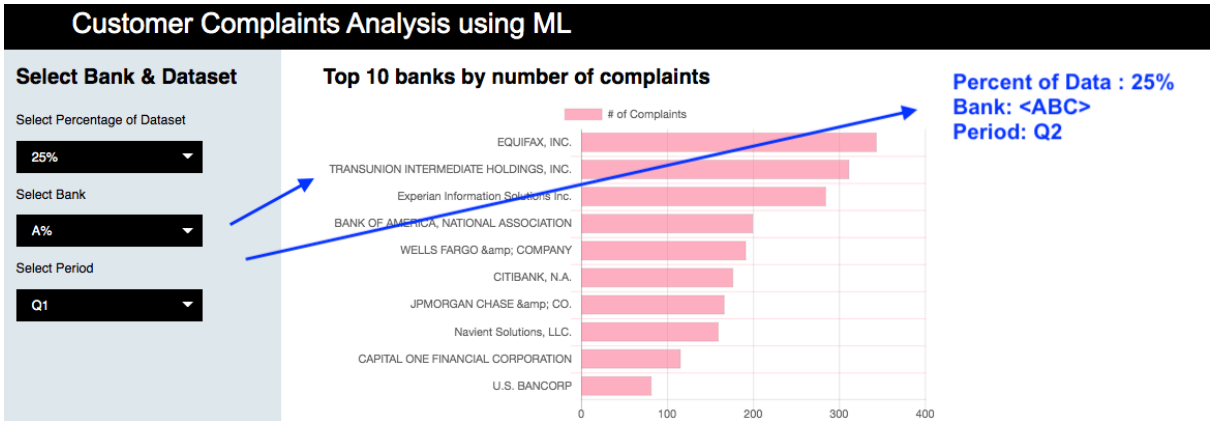
(15 marks)

b) For the Content Areas, create the Chart as illustrated. You can use any charting libraries that you are familiar with to implement the chart.

(5 marks)

c) Applying additional Javascript and DOM, enhance the code created in (a) to add in the following dynamic elements as described in the illustration below.

- when each of the selection is clicked, the labels on the top right of the UI should be updated accordingly with the selected information



(12 marks)

Question 2

The system will analyse feedback information from the firm's CRM system and hence this application will be storing the information with the following attributes

Feedback
- Customer Name
- Feedback information
- Feedback date / time
- Feedback Type (ie Positive / Negative)

Data Source
- File name
- Date uploaded
- File Description

Re-use the code in Q1 and design the necessary MVC models, controllers and views using the Flask Framework. You can use any of the following data structures to implement the models:

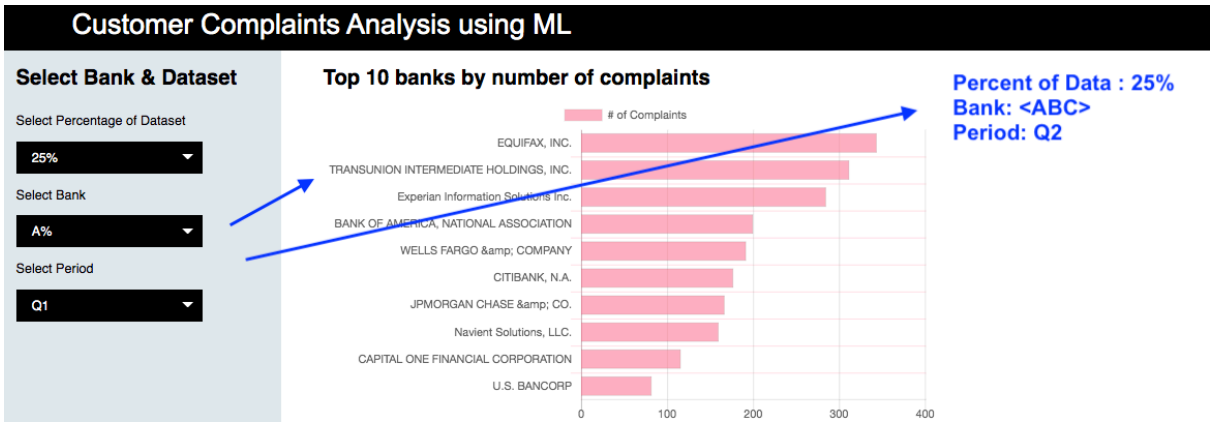
- List / Dictionaries
- ORM / Database
- Pandas Dataframe

a) List out the names of the following that you plan to implement in your flask applications

- models
- routes / controllers
- views

(6 marks)

b) Create a new folder q2 and create the Flask MVC application that will show the above UI.



The following requirements must be met:

- Implement all UI elements shown in the illustration

- The selection options for “Bank” and “Period” must be using values dynamically retrieve from the backend database / models.

(9 marks)

c) The chart needs to show the correct data based on the selection done (ie period, bank, percentage of data)

(15 marks)

d) Based on the requirements of the application, you have to decide what is the best way to implement the model.

Based on the 3 possible ways suggested in Q2,

Create a new POST in the Discussion Forum entitled “<TMA-Q2 >” and share the Pros-and-Cons for these 3 possible approaches, your choice of implementation and why you decided on this choice.

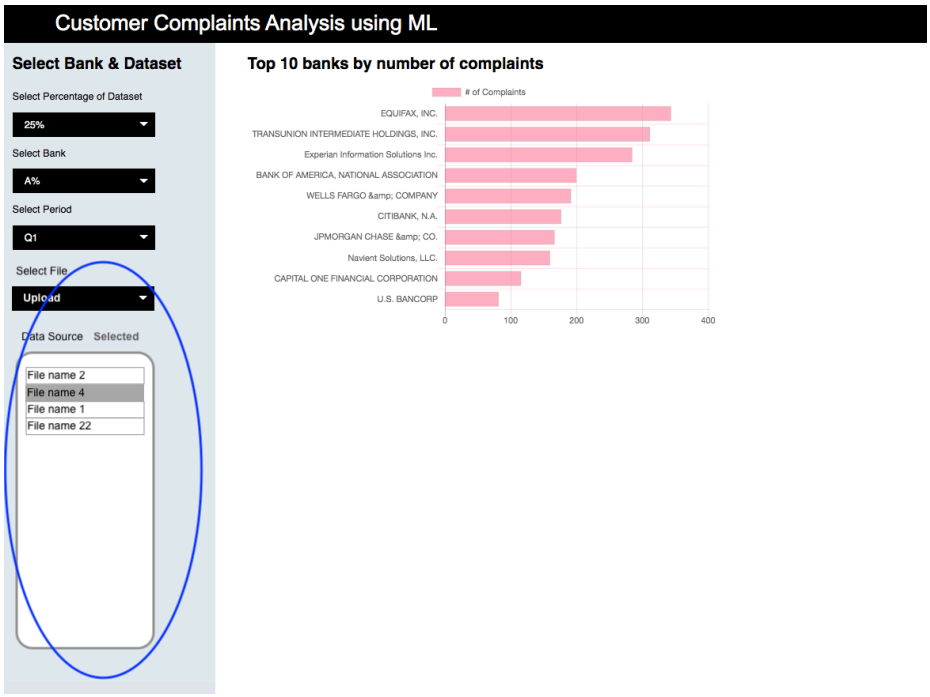
(7 marks)

Question 3

A sample of the CRM feedback data is made available at the following URL:

https://github.com/mengchoontan/school-239/raw/master/complaints-2020-02-08_03_28.csv

Based on the feedback from the various Project stakeholders, there was a strong case to enhance this application to allow Users to use their own feedback data files to perform the analysis.



Enhance the UI demonstration and implement a way to allow the user to upload 1 or more data files into the application backend.

The User should be able to select one of the uploaded data files and use it for analysis (i.e. the Dashboard will use this file's data for creating the charts and selector option values)

Create the Required "Datasource" selection interface as illustrated. Implement a method to allow the user to choose and upload a file to the server application and save it as a Datasource.model.

a) Create the "Select File" File upload UI elements. It should be able to select a file from your computer and uploads a File when the "Submit button is clicked

(15 marks)

b) Once a new "Datasource" file is upload, the "Select File" File upload UI elements should update itself and shows the File name of the uploaded File.

(8 marks)

c) After implementing the new data upload feature in 3a) you soon realized that there are several limitations to the new enhancement made. In order to manage the expectations of the Stakeholders, you have decided to highlight what are constraints and limitation of this new feature.

Create a new POST in the Discussion Forum entitled "<TMA-Q4 >" and share in your post what is the limitation of your implementation.

(4 marks)