SRS (Software Requirement Specification)

1. **Introduction** :
    a. Purpose :

    Automatic gender classification is receiving increasing attention, since gender carries rich and distinguished information concerning male and female social activities . The aim of gender classification is to recognize the gender of a person based on the characteristics that differentiate between male and female. For instance, a computer system with gender recognition functions has a wide range of applications in fundamental and applied research areas including: human-computer interaction (HCI), the security and surveillance industry, demographic research, commercial development, and mobile application and video games. Gender classification is done on basis of characteristics such as appearance, behavior, biometrics, bio-signals, and social network-based information.

    b. Intended Audience :

    - Classifying gender in surveillance systems for public places (e.g., bank, school) can assist intelligent security and surveillance systems to track moving objects, detect abnormal behaviors, and facilitate the security investigation off criminals who intentionally try to hide their identity information.
    - In a super market or department store, knowing the number of male and female customers helps the store managers to make effective sales and managing decisions.

    c. Intended Device (Mobile / Computer / Other) :

- Computers need to identify and verify human gender to improve the system performance based on personalized information. By successfully determining gender, the system can provide appropriate and customized services for users by adapting to them according to their gender.
- Gender classification can provide supportive information to improve the user experience in mobile applications (apps) and video games.
- In Robots also we need to add gender identification quality to improve the performance of robot .

2. **Proposed features / functionalities** :

We compare and evaluate existing gender recognition approaches in terms of accuracy, trustworthiness, invasiveness, collectability, and scope of the application.

Accuracy demonstrates the effectiveness of a gender classification system.

Trustworthiness indicates robustness and reliability. Invasiveness and collectivity jointly imply the complexity of the system.

The scope of application is based on the merit of each system, which is a case-by-case study.

3. **Operating environment / dependencies** :

a. Operating system :

It is suitable to use this gender classification application on any operating system. Preferably we are using Windows Operating system to develop the application.

b. Tools :

As we are using machine learning for gender identification , so we need to install python in our OS . We also need to install python libraries such as pandas , numpy , sklearn, flask ,Natural Language Processing .

Install Sublime to develop wep app using bootstrap .

c. Web Development Tools:

Install Sublime (web development environment) to create a web app with good front end .

Flash framework is used to develop webapps using python.

4. **Technology** :

a. Language :

- Python :
  For Machine Learning , python language is used . Python is the widely used language due its simplicity .
- HTML , CSS :
  Bootstrap is framework that is used to develop web applications . It is used to make high rated front ends of the web apps.

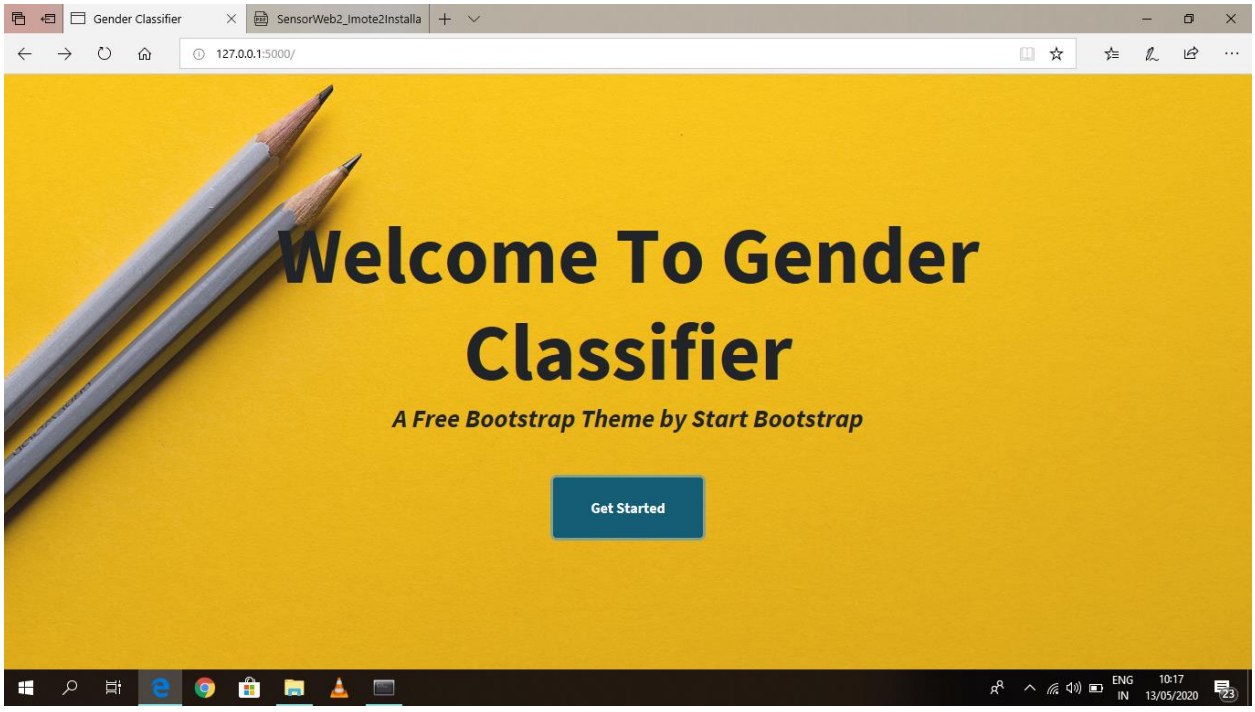
b. Framework :

- Flask :
  Flask is a popular Python web framework, meaning it is a third-party Python library used for developing web applications.
  Flask-Bootstrap is used to integrate backend python with frontend bootstrap .

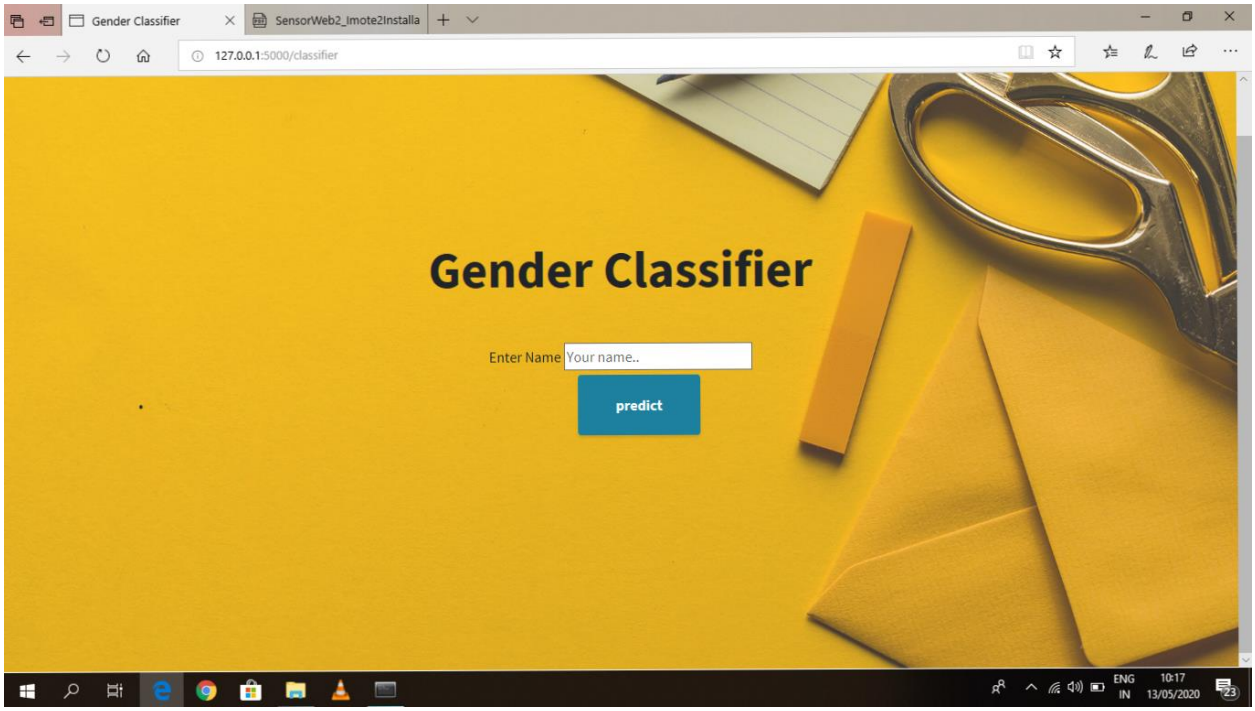
c. Database :

- Data sets are used for gender classification.
- If we are doing gender classification based on first name of person then data set will consists of first name of person and his / her gender.
- But if we are doing gender classification based on image processing then data set consists of hairstyle, body shape, clothing, eyebrows, and posture.

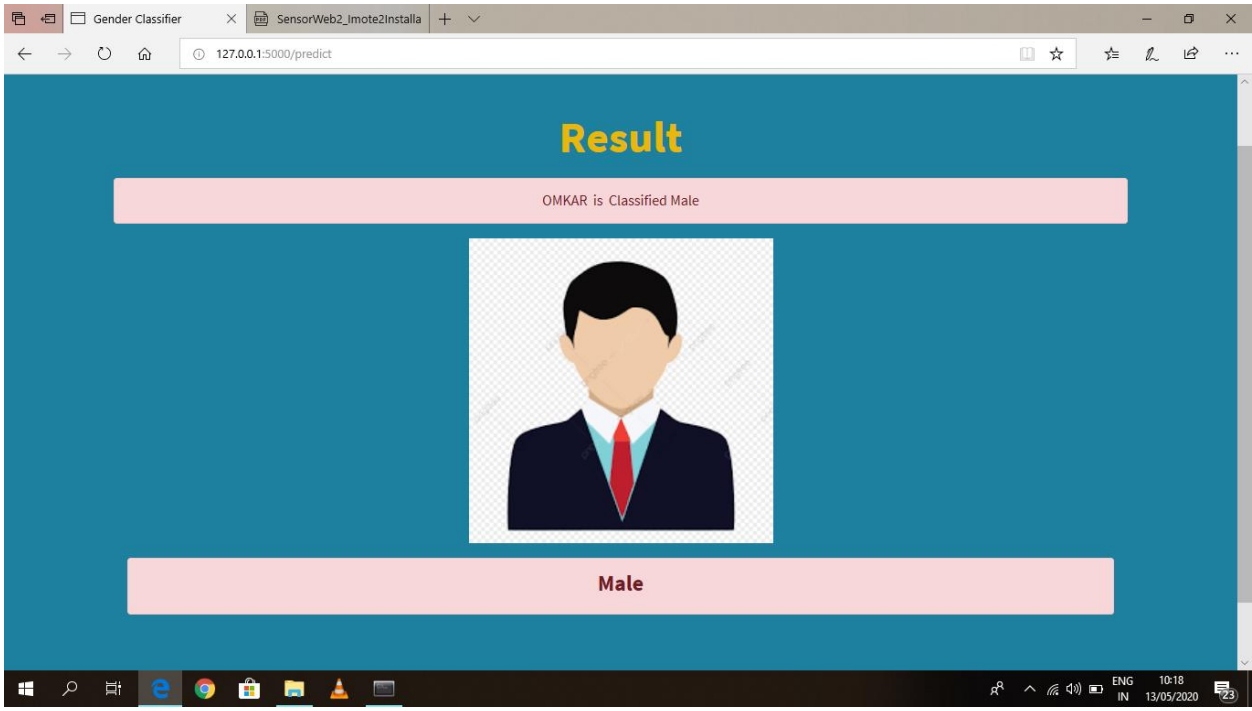
4. **User Interface basic Wireframe** :
   a. HomePage :

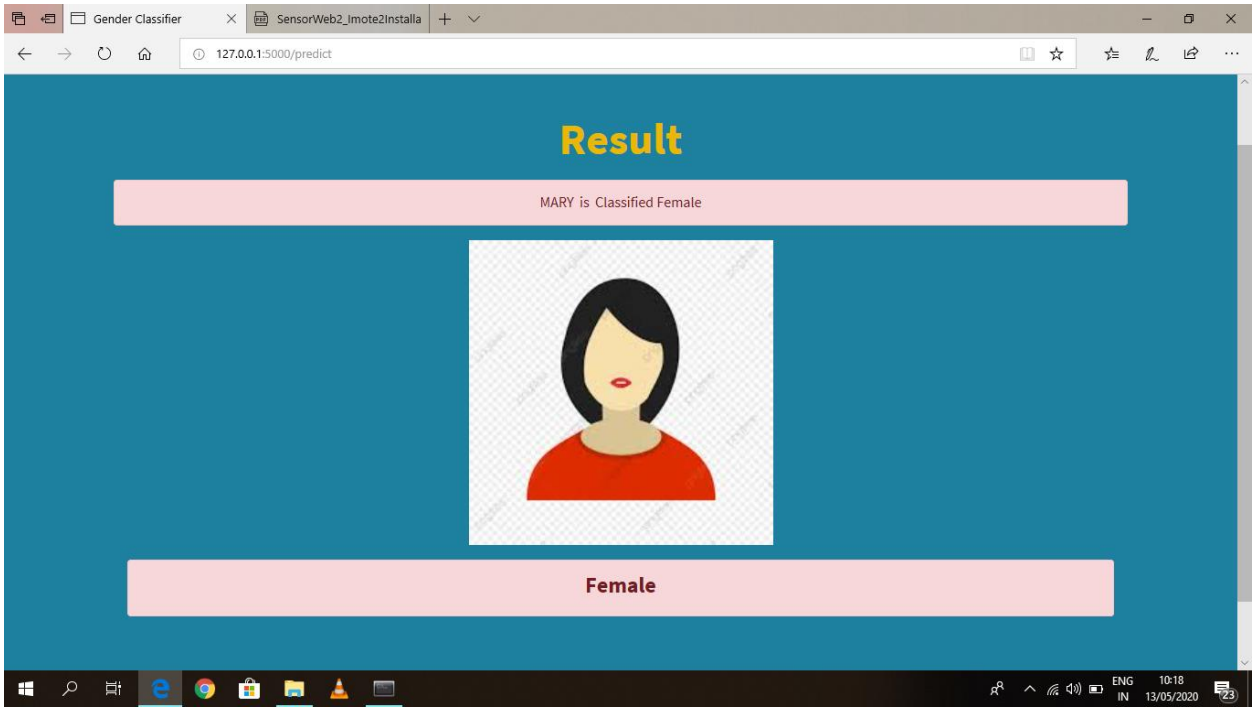


   b. Classifier page which will take users input :



c. Show the result to user :





5. **Algorithm** :
   A. Algorithm to use webapp :
      a. Start the web at localhost by entering the ip address http://127.0.0.1:5000 .It will open the index.html i.e. the home page of our webapp.
      b. Then on clicking on get started button it will lead us to classifier.html http://127.0.0.1:5000/classifier .
      c. On this web page the user has enter his/her name and click on predict .
      d. On click on predict it will call the post method predict of app1.py .
      e. After clicking on predict button it will bring us to result.html , which will tell the user whether they are male/female .
   B. Algorithm of predict function :
      a. First we will read the names_dataset.csv file present in data folder in a variable .
      b. We will replace the sex field data (i.e. M by 1 and F by 0).

c. Then we will have to convert the name field of our dataset to binary so we will perform Countvectorization of name field .
d. Now we will train our model and then we will test it .
e. We will use NaiveBayes classifier to classify male and female .
f. When user enters their name and clicks on predict button then it will make a post request to this function .
g. If the post request is made then ,
    - We will take the users input name .
    - We will convert it to binary by CountVectorizer .
    - Then we will classify it by using Naive bayes classifier .
    - At last we sent the prediction we got after classification and users name to result.html .

6. **Details** :

A. Pseudocode :

app1.py

```
#import packages
from flask import Flask,render_template,url_for,request
from flask_bootstrap import Bootstrap
import pandas as pd
import numpy as np


# ML Packages
from sklearn.feature_extraction.text import
CountVectorizer
from sklearn.feature_extraction import DictVectorizer
from sklearn.model_selection import train_test_split
from sklearn.naive_bayes import MultinomialNB

 route to homepage i.e. index.html
```

then route to classifier.html

at last we will route to predict

predict function :

In this function first we read the name_dataset.csv file .

then we will replace sex field i.e. F :1 and M: 0

Convert the names field to binary by using CountVectorizer .

Train and test our model by using datasets .

when the web app makes post request :

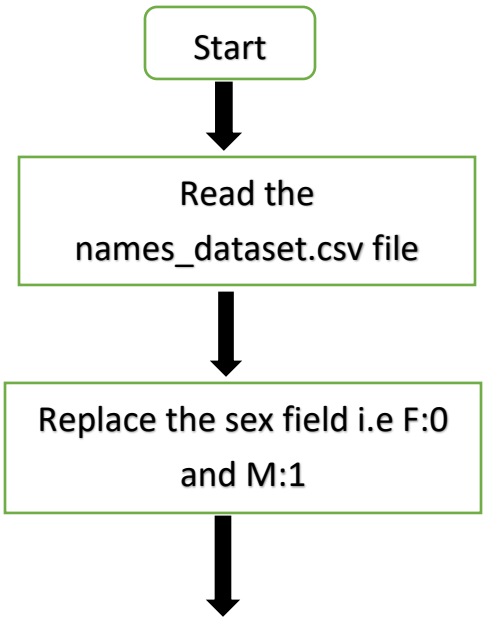
we will take the users input name

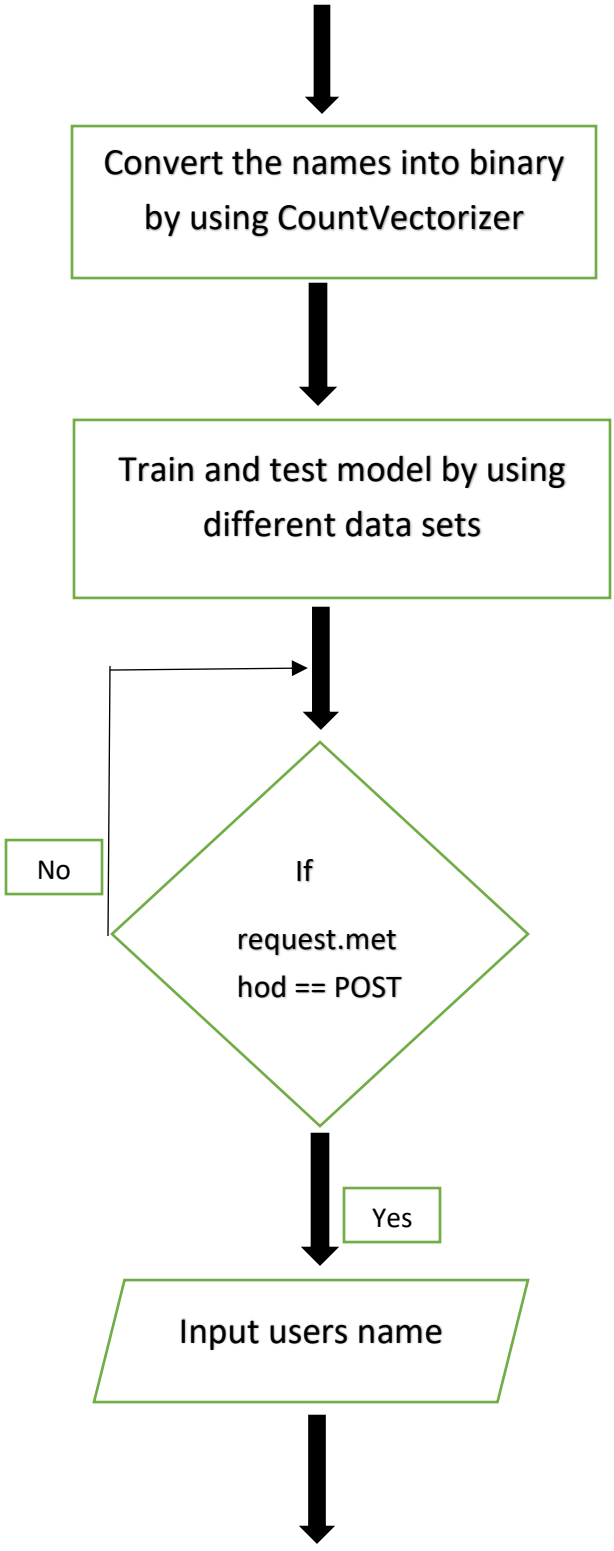
Convert it to binary by CountVectorizer.

Classify the gender by using NaiveBayes Classifier.

At last we will return the prediction and users name to the result.html file

C. Work flow diagram :




Convert the names into binary by using CountVectorizer
Train and test model by using different data sets
No
If
request.met
hod == POST
Yes
Input users name

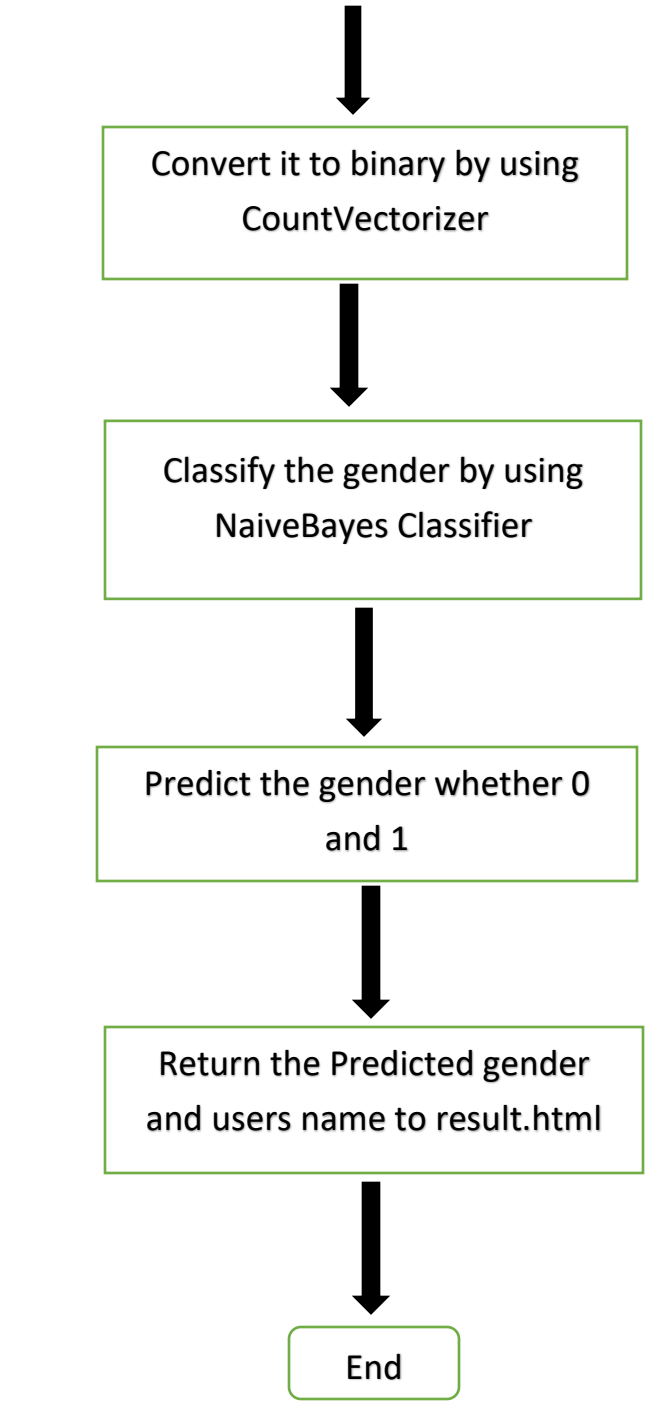


Fig. Work flow diagram for gender classification

7. **Conclusion** :

We had done the gender classification based on name of the user. Based on the name the user will get the output as whether they are male or female .

Consider a person has registered on applications such as amazon sales ,flipkart,myntra,snapdeal etc .
Then the google should classigy thier gender . On basis of that gender google should show them adds of tshirts , shoes , different items etc.
Consider if the girl has registered then google should them adds on girls related items .