Importing the Necessary Libraries like numpy,pandas,matplotlib,scikit-learn,seaborn .

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import accuracy_score
```

Data Collection / Data Loading

```
 titanic_data = pd.read_csv('titanic_train.csv')
```

```
titanic_data.head()
```

```
   PassengerId  Survived  Pclass  \
0            1         0       3   
1            2         1       1   
2            3         1       3   
3            4         1       1   
4            5         0       3   

                                                Name     Sex   Age 
SibSp  \
0                            Braund, Mr. Owen Harris    male  22.0 
1   
1  Cumings, Mrs. John Bradley (Florence Briggs Th...  female  38.0 
1   
2                             Heikkinen, Miss. Laina  female  26.0 
0   
3       Futrelle, Mrs. Jacques Heath (Lily May Peel)  female  35.0 
1   
4                           Allen, Mr. William Henry    male  35.0 
0   

   Parch            Ticket     Fare Cabin Embarked  
0      0         A/5 21171   7.2500   NaN        S  
1      0          PC 17599  71.2833   C85        C  
2      0  STON/O2. 3101282   7.9250   NaN        S  
3      0            113803  53.1000  C123        S  
4      0            373450   8.0500   NaN        S  
```

```
titanic_data.shape
```

```
(891, 12)
```

```
titanic_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 12 columns):
 #   Column       Non-Null Count  Dtype  
---  ------       --------------  -----  
 0   PassengerId  891 non-null    int64  
 1   Survived     891 non-null    int64  
 2   Pclass       891 non-null    int64  
 3   Name         891 non-null    object 
 4   Sex          891 non-null    object 
 5   Age          714 non-null    float64
 6   SibSp        891 non-null    int64  
 7   Parch        891 non-null    int64  
 8   Ticket       891 non-null    object 
 9   Fare         891 non-null    float64
 10  Cabin        204 non-null    object 
 11  Embarked     889 non-null    object 
dtypes: float64(2), int64(5), object(5)
memory usage: 83.7+ KB
```

```
titanic_data.isnull().sum()
```

```
PassengerId      0
Survived         0
Pclass           0
Name             0
Sex              0
Age            177
SibSp            0
Parch            0
Ticket           0
Fare             0
Cabin          687
Embarked         2
dtype: int64
```

```
#removing Null Values/missing
titanic_data = titanic_data.drop(columns = 'Cabin', axis = 1)

#replacing missing values with mean number
titanic_data['Age'] = 
titanic_data['Age'].fillna(titanic_data['Age'].mean())

titanic_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 11 columns):
 #   Column       Non-Null Count  Dtype  
---  ------       --------------  -----  
 0   PassengerId  891 non-null    int64  
 1   Survived     891 non-null    int64
 2   Pclass       891 non-null    int64
 3   Name         891 non-null    object
 4   Sex          891 non-null    object
 5   Age          891 non-null    float64
 6   SibSp        891 non-null    int64
 7   Parch        891 non-null    int64
 8   Ticket       891 non-null    object
 9   Fare         891 non-null    float64
 10  Embarked     889 non-null    object
dtypes: float64(2), int64(5), object(4)
memory usage: 76.7+ KB
```

```
 titanic_data.isnull().sum()
```

```
PassengerId    0
Survived       0
Pclass         0
Name           0
Sex            0
Age            0
SibSp          0
Parch          0
Ticket         0
Fare           0
Embarked       2
dtype: int64
```

We can't fill these 2 Null data of Embarked with Mean value, because Embarked has categorical data,and for categorical data we can't find mean.We can Check for the most repetitive value or we can find mode of this column and we can fill those two Null Entries With the Mode value.

```
#let's fix the Embarked
print(titanic_data['Embarked'].mode())
```

```
0    S
Name: Embarked, dtype: object
```

```
print(titanic_data['Embarked'].mode()[0])
```

```
S
```

```
#replace the mode value with the missing value
titanic_data['Embarked'] =
titanic_data['Embarked'].fillna(titanic_data['Embarked'].mode()[0])
```

```
#re-checking the Null Values
```

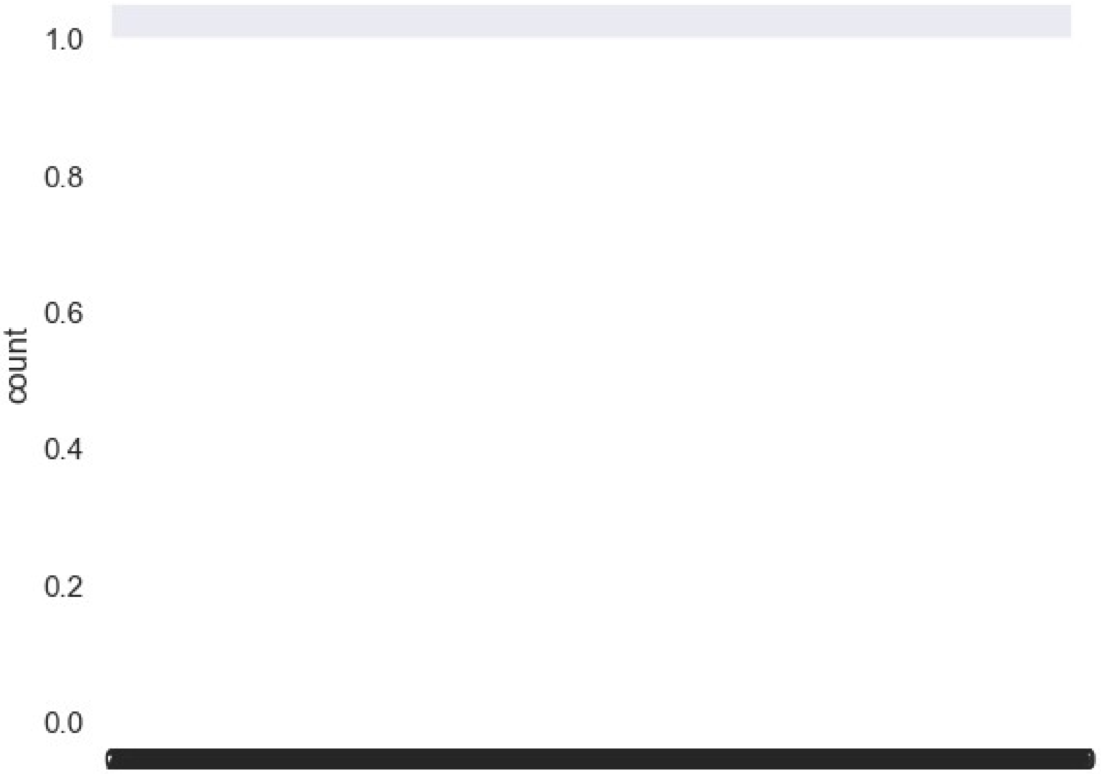
```
 titanic_data.isnull().sum()
```

```
PassengerId    0
Survived       0
Pclass         0
Name           0
Sex            0
Age            0
SibSp          0
Parch          0
Ticket         0
Fare           0
Embarked       0
dtype: int64
```

Analyzing The Data

```
titanic_data.describe()

       PassengerId    Survived      Pclass         Age       SibSp  \
count   891.000000  891.000000  891.000000  891.000000  891.000000   
mean    446.000000    0.383838    2.308642   29.699118    0.523008   
std     257.353842    0.486592    0.836071   13.002015    1.102743   
min       1.000000    0.000000    1.000000    0.420000    0.000000   
25%     223.500000    0.000000    2.000000   22.000000    0.000000   
50%     446.000000    0.000000    3.000000   29.699118    0.000000   
75%     668.500000    1.000000    3.000000   35.000000    1.000000   
max     891.000000    1.000000    3.000000   80.000000    8.000000   

            Parch        Fare  
count  891.000000  891.000000  
mean     0.381594   32.204208  
std      0.806057   49.693429  
min      0.000000    0.000000  
25%      0.000000    7.910400  
50%      0.000000   14.454200  
75%      0.000000   31.000000  
max      6.000000  512.329200  

# how many People Survived

titanic_data['Survived'].value_counts()

Survived
0    549
1    342
Name: count, dtype: int64

# Visualizing The Data now,

sns.set()

sns.countplot(titanic_data['Survived'])
```

```
<Axes: ylabel='count'>
```

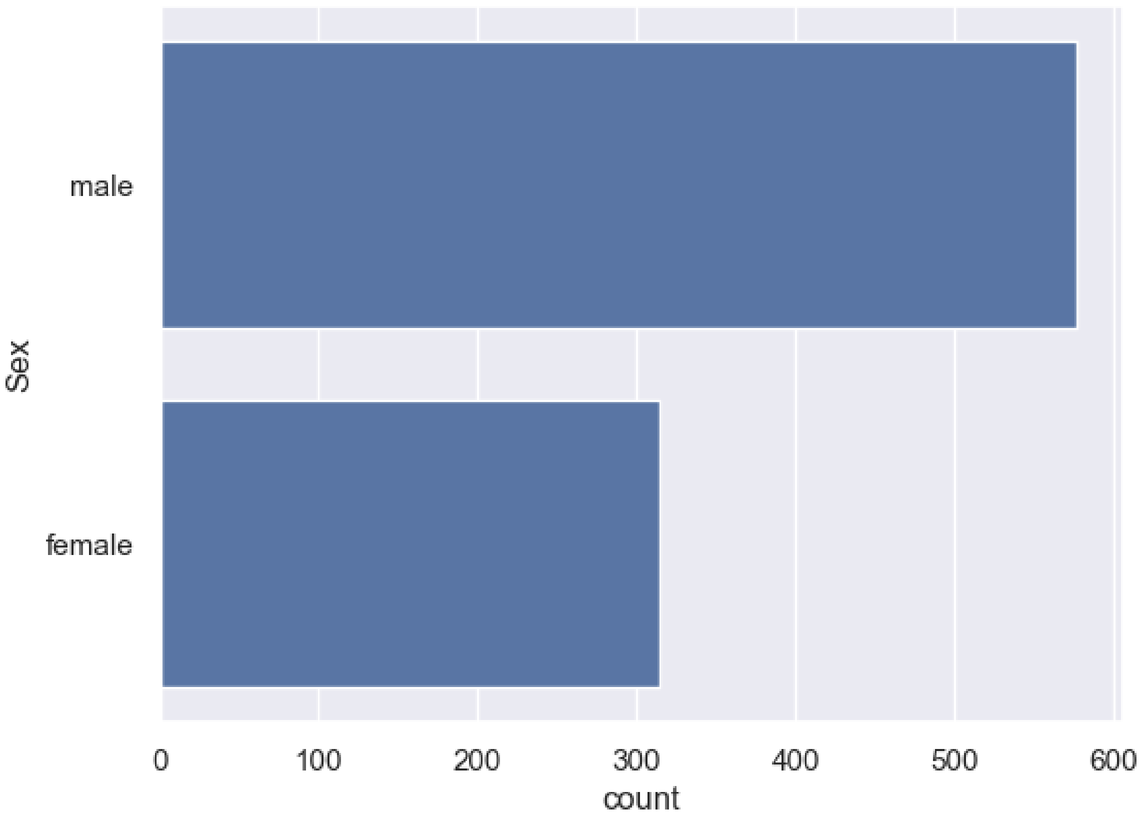


```
titanic_data['Sex'].value_counts()
```

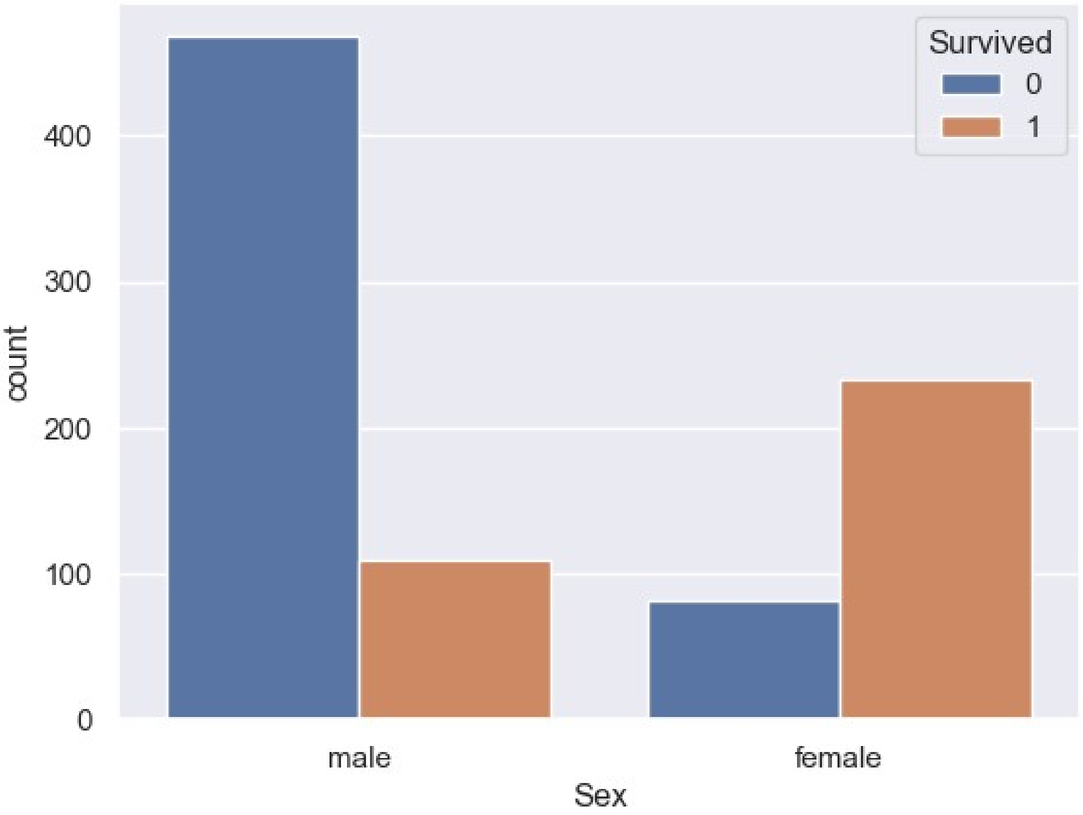
```
Sex
male      577
female    314
Name: count, dtype: int64
```

```
# Count Plot for "Sex" Column
sns.countplot(titanic_data['Sex'])
```

```
<Axes: xlabel='count', ylabel='Sex'>
```

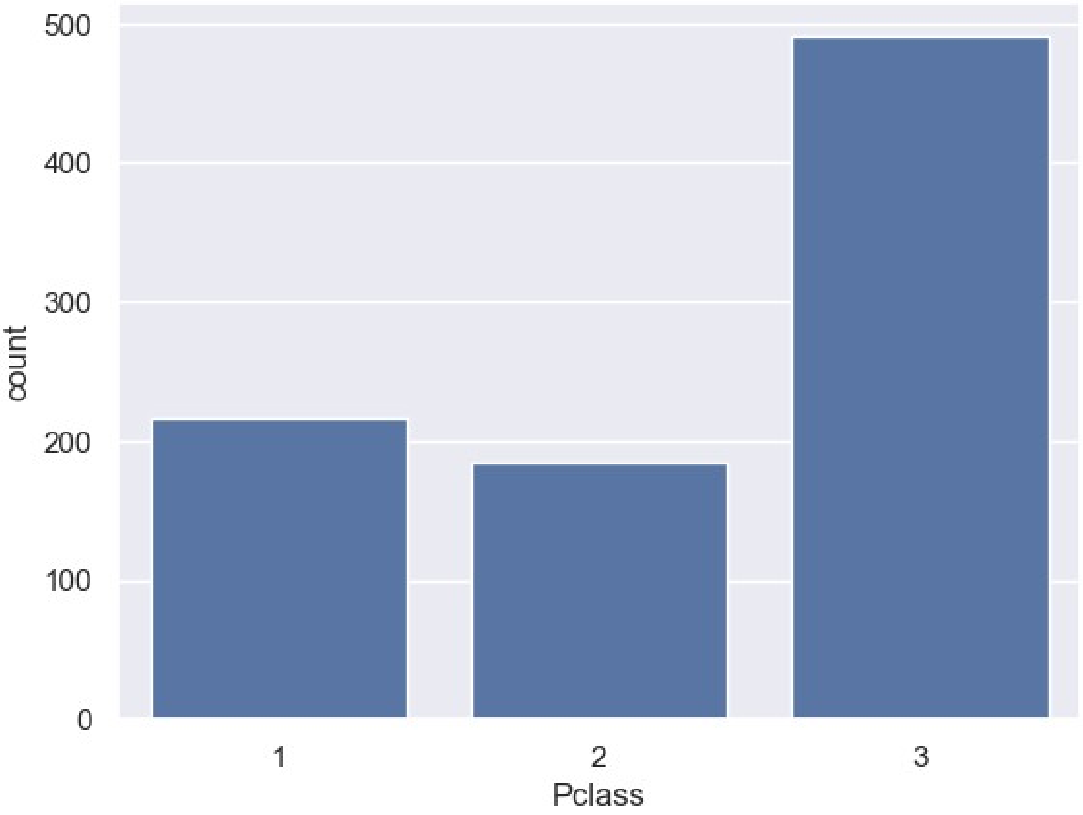


```
# Analyzing Gender Wise Survivors
sns.countplot(x='Sex', hue = 'Survived', data = titanic_data)

<Axes: xlabel='Sex', ylabel='count'>
```



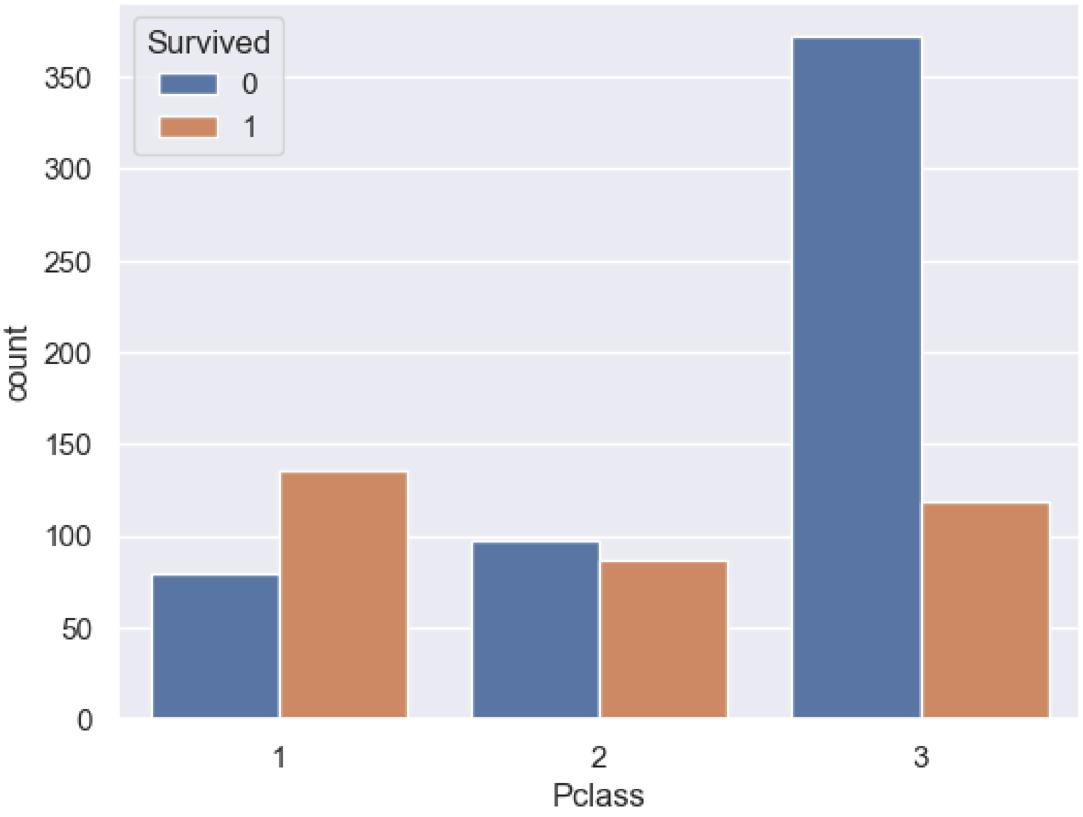
```
# count plot for "Pclass" Column
sns.countplot(x = 'Pclass', data = titanic_data)
```

```
<Axes: xlabel='Pclass', ylabel='count'>
```



```
sns.countplot(x = 'Pclass', hue = 'Survived', data = titanic_data)
```

```
<Axes: xlabel='Pclass', ylabel='count'>
```



```
# Encoding Categorical Columns/Data

titanic_data['Sex'].value_counts()
```

```
Sex
male      577
female    314
Name: count, dtype: int64
```

```
titanic_data['Embarked'].value_counts()
```

```
Embarked
S    646
C    168
Q     77
Name: count, dtype: int64
```

```
titanic_data.replace({'Sex':{'male':0,'female':1}, 'Embarked':
{'S':0,'C':1,'Q':2}}, inplace=True)

X = titanic_data.drop(columns =
['PassengerId','Name','Ticket','Survived'],axis=1)
Y = titanic_data['Survived']

print(X)
```

```
     Pclass  Sex        Age  SibSp  Parch     Fare  Embarked
0         3    0  22.000000      1      0   7.2500         0
1         1    1  38.000000      1      0  71.2833         1
2         3    1  26.000000      0      0   7.9250         0
3         1    1  35.000000      1      0  53.1000         0
4         3    0  35.000000      0      0   8.0500         0
..      ...  ...        ...    ...    ...      ...       ...
886       2    0  27.000000      0      0  13.0000         0
887       1    1  19.000000      0      0  30.0000         0
888       3    1  29.699118      1      2  23.4500         0
889       1    0  26.000000      0      0  30.0000         1
890       3    0  32.000000      0      0   7.7500         2

[891 rows x 7 columns]
```

```
print(Y)
```

```
0      0
1      1
2      1
3      1
4      0
      ..
886    0
887    1
888    0
889    1
890    0
Name: Survived, Length: 891, dtype: int64
```

```
# Split the data into test data and train data

X_train, X_test, Y_train, Y_test = train_test_split(X,Y,
test_size=0.2, random_state=2)

print(X.shape, X_train.shape,X_test.shape)
```

```
(891, 7) (712, 7) (179, 7)
```

```
# Logistical regression and model training

model = LogisticRegression()

#use the train data on logisticregression model
model = LogisticRegression(max_iter=1000)
model.fit(X_train, Y_train)

# evaluating and testing the model

X_train_prediction = model.predict(X_train)

print(X_train_prediction)
```

```
[0 1 0 0 0 0 0 1 0 0 0 1 0 0 1 0 1 0 0 0 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1
0 1
 0 0 0 0 0 0 1 1 0 0 1 0 1 0 1 0 0 0 0 0 0 1 0 1 0 0 1 1 0 0 1 1 0 1 0
0 1
 0 0 0 0 0 0 1 0 0 0 1 0 0 0 1 0 1 0 0 1 0 0 0 1 1 1 0 1 0 0 0 0 0 1 0
0 0
 1 1 0 0 1 0 0 1 0 0 1 0 0 1 0 1 0 1 0 1 0 1 1 1 1 1 1 0 0 1 1 1 0 0 1
0 0
 0 0 0 0 1 0 1 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 1 1 0 0 1 0 1 0 1
1 1
 0 0 0 1 0 0 0 1 0 0 1 0 0 0 1 1 0 1 0 0 0 0 0 1 1 0 1 1 1 1 0 0 0 0 0
0 0
 0 1 0 0 1 1 1 0 0 1 0 1 1 1 0 0 1 0 0 0 0 1 0 0 0 1 0 0 0 1 0 1 0 1 0
0 0
 0 0 0 0 0 0 1 0 1 0 0 1 0 0 1 0 1 0 1 1 0 0 0 0 1 0 1 0 0 1 0 0 0 1 0
0 0
 0 1 1 0 0 0 0 0 0 1 0 1 0 0 0 0 0 1 1 1 0 0 0 1 0 1 0 0 0 0 0 0 1 1 0
1 1
 0 1 1 1 0 0 0 0 0 0 0 0 0 1 0 0 1 1 1 0 1 0 0 0 0 1 1 0 0 0 1 0 1 1 1
0 0
 0 0 1 0 0 0 1 1 0 0 1 0 0 0 0 1 0 0 0 0 0 1 0 0 0 0 1 0 1 1 1 0 1 1 0
0 0
 0 1 0 1 0 0 1 1 0 0 0 0 1 0 0 0 0 1 1 0 1 0 1 0 0 0 0 0 1 0 0 0 0 1 1
0 0
 1 0 1 0 0 1 0 0 0 0 0 0 0 0 1 0 0 1 1 0 0 0 1 1 0 1 0 0 1 0 0 0 1 1 0
1 0
 0 0 0 0 1 0 0 1 0 1 1 0 0 1 0 0 1 0 0 0 1 0 1 1 0 0 1 1 0 1 0 1 1 1 0
1 0
 0 1 0 0 1 0 0 1 0 0 0 0 1 1 0 0 1 0 1 0 0 0 0 0 0 1 1 1 0 0 1 1 0 0 0
0 0
 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1 0 1 0 0
0 0
 0 0 1 0 0 0 0 0 1 0 1 0 1 0 0 0 1 0 1 1 1 0 0 0 1 0 1 0 0 0 1 1 1 0 0
1 1
 0 0 0 1 0 1 0 0 0 0 0 1 1 0 1 1 1 0 0 0 1 0 0 0 0 1 0 0 0 1 0 0 1 0 0
0 0
 1 0 0 1 0 1 0 0 0 1 1 1 1 1 0 0 1 1 0 1 1 1 1 0 0 0 1 1 0 0 1 0 0 0 0
0 0
 0 0 0 1 1 0 0 1 0]
```

```python
training_data_accuracy = accuracy_score(Y_train, X_train_prediction)
print('Accuracy score of training data : ', training_data_accuracy)
```

```
Accuracy score of training data :  0.8089887640449438
```

```python
#check accuracy of test data
X_test_prediction = model.predict(X_test)

print(X_test_prediction)
```

```
[0 0 1 0 0 0 0 0 0 0 0 1 1 0 0 1 0 0 1 0 1 1 0 1 0 1 1 0 0 0 0 0 0 0 0
1 1
 0 0 0 0 0 1 0 0 1 1 0 0 1 0 0 0 0 0 0 1 0 0 0 1 0 0 0 1 0 1 0 0 0 1 0
1 0
 1 0 0 0 1 0 1 0 0 0 1 1 0 0 1 0 0 0 0 0 0 1 0 1 0 0 1 0 1 1 0 1 1 0 0
0 0
 0 0 0 1 1 0 1 0 0 1 0 0 0 0 0 0 1 0 0 0 0 1 1 0 0 0 0 0 0 1 1 1 1 0 1
0 0
 0 1 0 0 0 0 1 0 0 1 1 0 1 0 0 0 1 1 0 0 1 0 0 1 1 1 0 0 0 0 0]
```

```
test_data_accuracy = accuracy_score(Y_test, X_test_prediction)
print('Accuracy score of test data:', test_data_accuracy)
```

```
Accuracy score of test data: 0.7821229050279329
```

```
#ends...but
import joblib
joblib.dump(model, 'logistic_regression_model.pkl')
```

```
['logistic_regression_model.pkl']
```

```
!pip install pyngrok

import subprocess
import os
from pyngrok import ngrok
#setup ngrok with authtoken

ngrok.set_auth_token("2vaXIr54ZaPxrw3KM0RwLx7QZx6_4e9RvLoPGGXSPeqR6LTD
j")

#running flask app
os.system("nohup python -m flask run --no-reload &")

#opening ngrok tunnel to the flask app uding http protocol
proc = subprocess.Popen(["ngrok", "http", "5000"])

#Retrive ngrok's public url here
public_url = ngrok.connect(addr="5000", proto="http")
print("Public URL:", public_url)
```

```
Requirement already satisfied: pyngrok in c:\users\aaditya raj pandey\
appdata\local\programs\python\python313\lib\site-packages (7.2.3)
Requirement already satisfied: PyYAML>=5.1 in c:\users\aaditya raj
pandey\appdata\local\programs\python\python313\lib\site-packages (from
pyngrok) (6.0.2)
Public URL: NgrokTunnel: "https://6dc0-103-214-60-139.ngrok-free.app"
-> "http://localhost:5000"
```

```
from flask import Flask, request, jsonify
import joblib
```

```
from pyngrok import ngrok
from IPython.display import display, HTML

# Load the trained model
model = joblib.load('logistic_regression_model.pkl')

app = Flask(__name__)

@app.route('/')
def home():
    # HTML form to take inputs
    html_form = """
    <!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-
scale=1.0">
    <title>Titanic Survival Prediction</title>
    <style>
        body {
            background-color: black;
            color: white;
            font-family: Arial, sans-serif;
            text-align: center;
            padding: 20px;
        }
        #predictionForm {
            display: inline-block;
            text-align: left;
        }
        img {
            max-width: 100%;
            height: auto;
        }
    </style>
</head>
<body>
    <h2>Titanic Survival Prediction</h2>
    <form id="predictionForm" method="post" action="/predict">
        <label for="pclass">Pclass:</label>
        <input type="text" id="pclass" name="pclass"><br><br>

        <label for="sex">Sex (0 for male, 1 for female):</label>
        <input type="text" id="sex" name="sex"><br><br>

        <label for="age">Age:</label>
        <input type="text" id="age" name="age"><br><br>

        <label for="sibsp">SibSp:</label>
        <input type="text" id="sibsp" name="sibsp"><br><br>

        <label for="parch">Parch:</label>
        <input type="text" id="parch" name="parch"><br><br>

        <label for="fare">Fare:</label>
        <input type="text" id="fare" name="fare"><br><br>

        <label for="embarked">Embarked (0 for S, 1 for C, 2 for
Q):</label>
        <input type="text" id="embarked" name="embarked"><br><br>

        <button type="button"
onclick="predictSurvival()">Predict</button>
    </form>

    <p id="predictionResult"></p>

    <img
src="https://upload.wikimedia.org/wikipedia/commons/thumb/f/fd/RMS_Tit
anic_3.jpg/800px-RMS_Titanic_3.jpg" alt="Titanic Image">

    <script>
        function predictSurvival() {
            var xhr = new XMLHttpRequest();
            var url = "/predict";
            var data = new
FormData(document.getElementById("predictionForm")); // Changed to
FormData

            xhr.open("POST", url, true);
            xhr.onreadystatechange = function () {
                if (xhr.readyState === 4 && xhr.status === 200) {
                    var response = JSON.parse(xhr.responseText);

document.getElementById("predictionResult").innerHTML = "Survival
Prediction: " + response.prediction;
                }
            };
            xhr.send(data);
        }
    </script>
</body>
</html>

    """
    return html_form

@app.route('/predict', methods=['POST'])
def predict():
    # Access form data
    pclass = request.form['pclass']
    sex = request.form['sex']
    age = request.form['age']
    sibsp = request.form['sibsp']
    parch = request.form['parch']
    fare = request.form['fare']
    embarked = request.form['embarked']

    # Convert data to appropriate types
    pclass = int(pclass)
    sex = int(sex)
    age = float(age)
    sibsp = int(sibsp)
    parch = int(parch)
    fare = float(fare)
    embarked = int(embarked)

    # Make prediction
    features = [[pclass, sex, age, sibsp, parch, fare, embarked]]
    prediction = model.predict(features)[0]

    return jsonify({'prediction': int(prediction)})

def run_flask_app():
    # Run Flask app on port 5000
    app.run(host='127.0.0.1', port=5000, debug=True,
use_reloader=False)

# Start ngrok tunnel
public_url = ngrok.connect(addr="5000", proto="http")
print("Public URL:", public_url)

# Display ngrok tunnel URL
display(HTML(f"<h2>Open this link in your browser to access the
application:</h2><p>{public_url}</p>"))

try:
    # Keep the Flask app running
    run_flask_app()
except KeyboardInterrupt:
    # Shutdown ngrok and Flask app
    ngrok.kill()
```

```
Public URL: NgrokTunnel: "https://01d6-103-214-60-139.ngrok-free.app"
-> "http://localhost:5000"
```

```
<IPython.core.display.HTML object>
```

```
 * Serving Flask app '__main__'
 * Debug mode: on
```

```
WARNING: This is a development server. Do not use it in a production
deployment. Use a production WSGI server instead.
 * Running on http://127.0.0.1:5000
Press CTRL+C to quit
```