```
import pandas as pd
import numpy as np
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 = pd.read_csv(r"D:\Excel Analyst\Machine Learning\Data set\
Titanic-Dataset.csv")

data.head(10)
```

```
   PassengerId  Survived  Pclass  \
0            1         0       3
1            2         1       1
2            3         1       3
3            4         1       1
4            5         0       3
5            6         0       3
6            7         0       1
7            8         0       3
8            9         1       3
9           10         1       2

                                                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
5                                   Moran, Mr. James    male   NaN
0
6                            McCarthy, Mr. Timothy J    male  54.0
0
7                     Palsson, Master. Gosta Leonard    male   2.0
3
8  Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg)  female  27.0
0
9                Nasser, Mrs. Nicholas (Adele Achem)  female  14.0
1

   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
5      0            330877   8.4583   NaN         Q
6      0             17463  51.8625   E46         S
7      1            349909  21.0750   NaN         S
8      2            347742  11.1333   NaN         S
9      0            237736  30.0708   NaN         C

Percentage = (data.isnull().sum()/data.shape[0])*100
```

Percentage of empty data column wise

```
Percentage # Percentage of empty data column wise

PassengerId     0.000000
Survived        0.000000
Pclass          0.000000
Name            0.000000
Sex             0.000000
Age            19.865320
SibSp           0.000000
Parch           0.000000
Ticket          0.000000
Fare            0.000000
Cabin          77.104377
Embarked        0.224467
dtype: float64
```

Checking sum of null values in each column

```
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
```

Total Null Data

```
data.isnull().sum().sum()   # Total Empty Data
```

```
866
```

```
data.shape[0]
```

```
891
```

Empty Percentage of Age column

```
(data['Age'].isnull().sum()/data.shape[0])*100  # Empty Percentage of 
Age column Less than 50 % so we will fill this column
```

```
19.865319865319865
```

Empty Percentage of Cabin column

```
(data['Cabin'].isnull().sum()/data.shape[0])*100  # Empty Percentage 
of Cabin column is greater than 50 % so drop this column
```

```
77.10437710437711
```

Overview of data like mean, median, std, max, min, Quartile, count etc

```
data.describe()
```

```
       PassengerId    Survived      Pclass         Age       SibSp  \
count   891.000000  891.000000  891.000000  714.000000  891.000000   
mean    446.000000    0.383838    2.308642   29.699118    0.523008   
std     257.353842    0.486592    0.836071   14.526497    1.102743   
min       1.000000    0.000000    1.000000    0.420000    0.000000   
25%     223.500000    0.000000    2.000000   20.125000    0.000000   
50%     446.000000    0.000000    3.000000   28.000000    0.000000   
75%     668.500000    1.000000    3.000000   38.000000    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
```

Mean of Age

```
data['Age'].mean() # Get Mean
```

```
29.69911764705882
```

Filling mean value place of null in age column

```
data['Age'].fillna(data['Age'].mean(),inplace=True) # fill mean value
```

```
data['Age'].isnull().sum()
```

```
0
```

Drop Column

```
data.drop(['Cabin'],axis=1,inplace=True)   # Drop column Cabin
```

```
data.isnull().sum().sum()   #
```

```
2
```

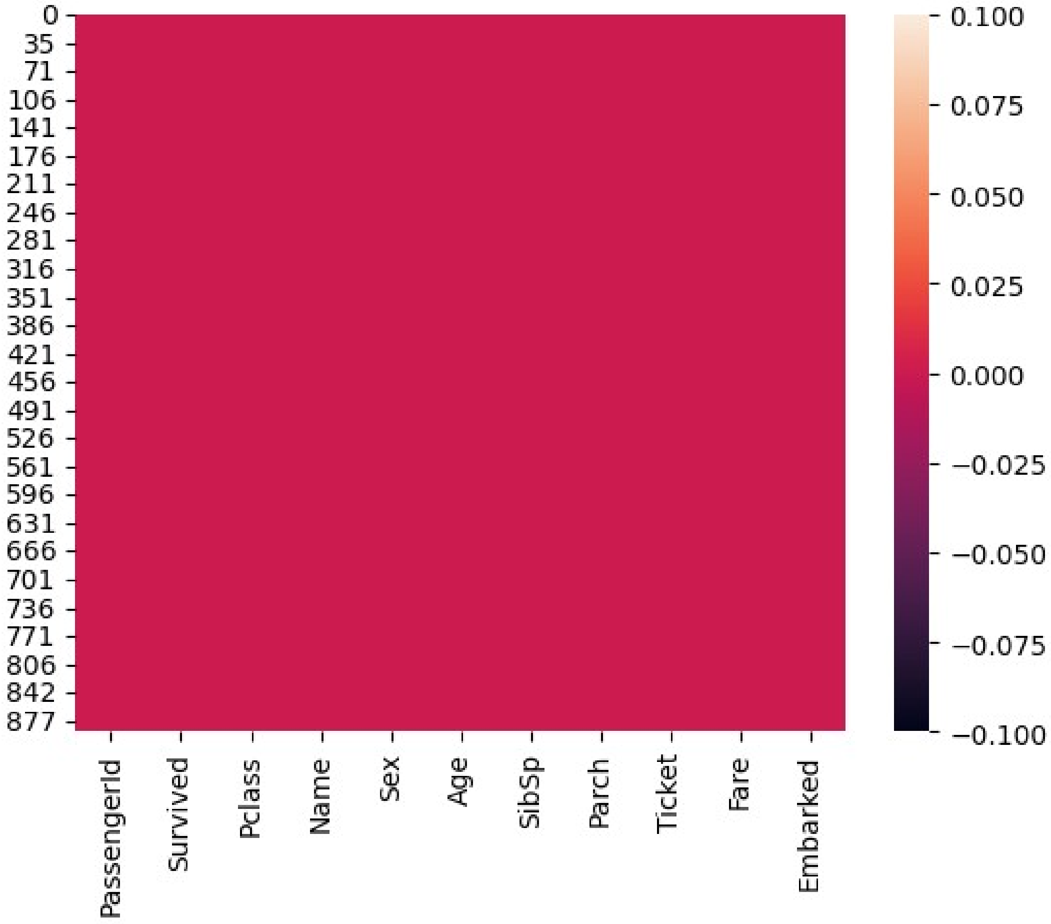
Drop empty row

```
data.dropna(inplace=True)   # Drop empty row only
```

```
data.isnull().sum().sum()  # There are no null values now data is
clean
```

```
0
```

```
sns.heatmap(data.isnull())  # There are no null values
plt.show()
```

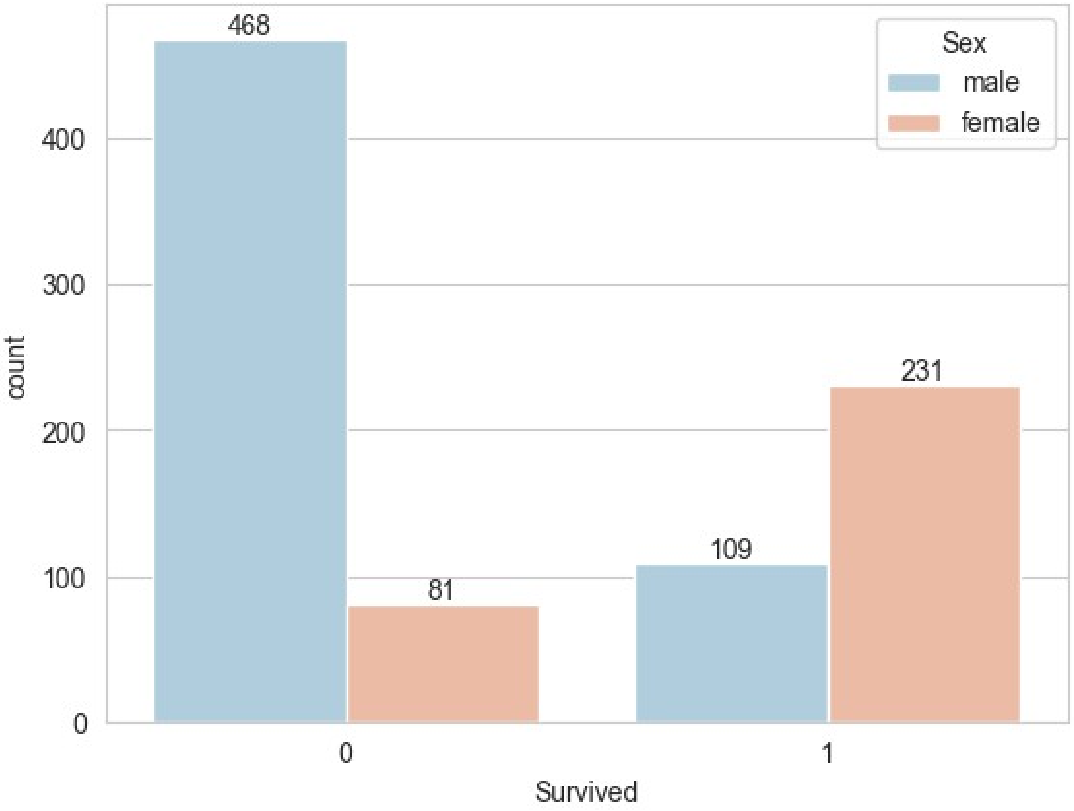


Number of Survival, Gender wise

```
data['Survived'].value_counts()
```

```
Survived
0    549
1    340
Name: count, dtype: int64
```

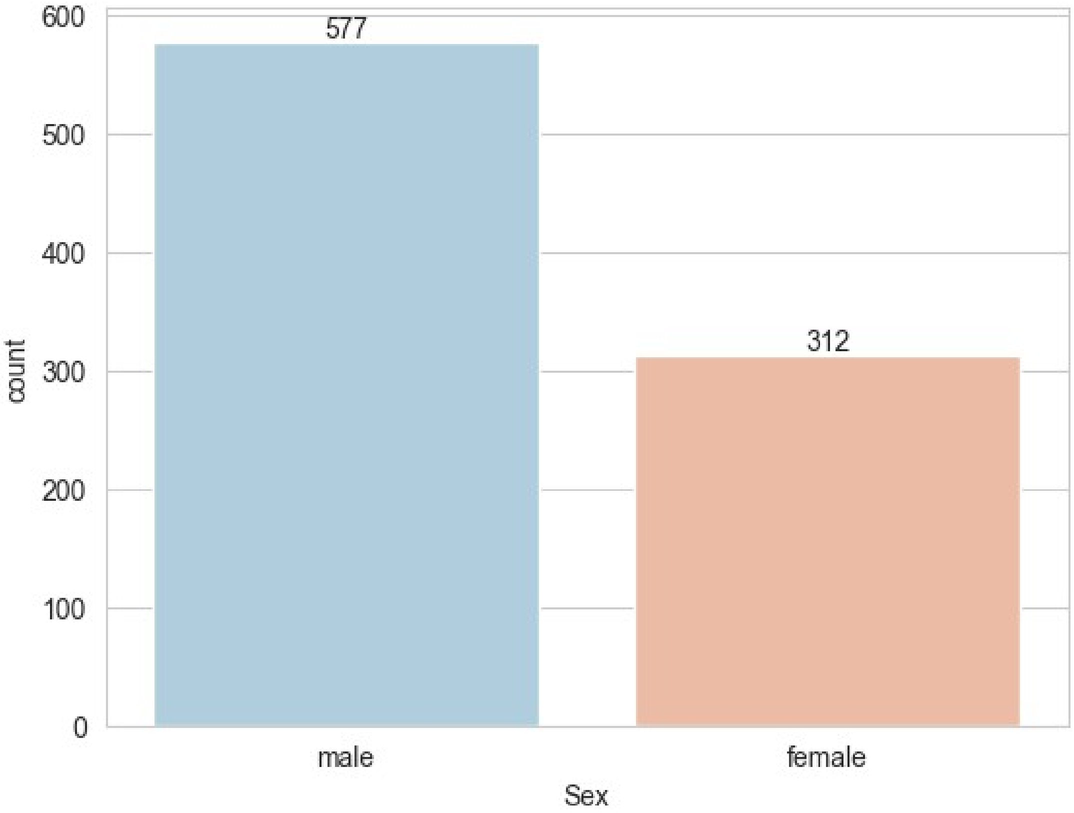
```
sns.set_style('whitegrid')
ds = sns.countplot(x='Survived',hue='Sex',data=data,palette='RdBu_r')
for bars in ds.containers:
    ds.bar_label(bars)
```



Number of male and female

```
num_females = data[data['Sex'] == 'female'].shape[0]
print(f"The number of females in the Titanic : {num_females}")

The number of females in the Titanic : 312

num_males = data[data['Sex'] == 'male'].shape[0]

print(f"The number of males in the Titanic : {num_males}")

The number of males in the Titanic : 577

data['Sex'].value_counts()

Sex
male      577
female    312
Name: count, dtype: int64

sns.set_style('whitegrid')
ds = sns.countplot(x='Sex',data=data,palette='RdBu_r')
for bars in ds.containers:
    ds.bar_label(bars)
```

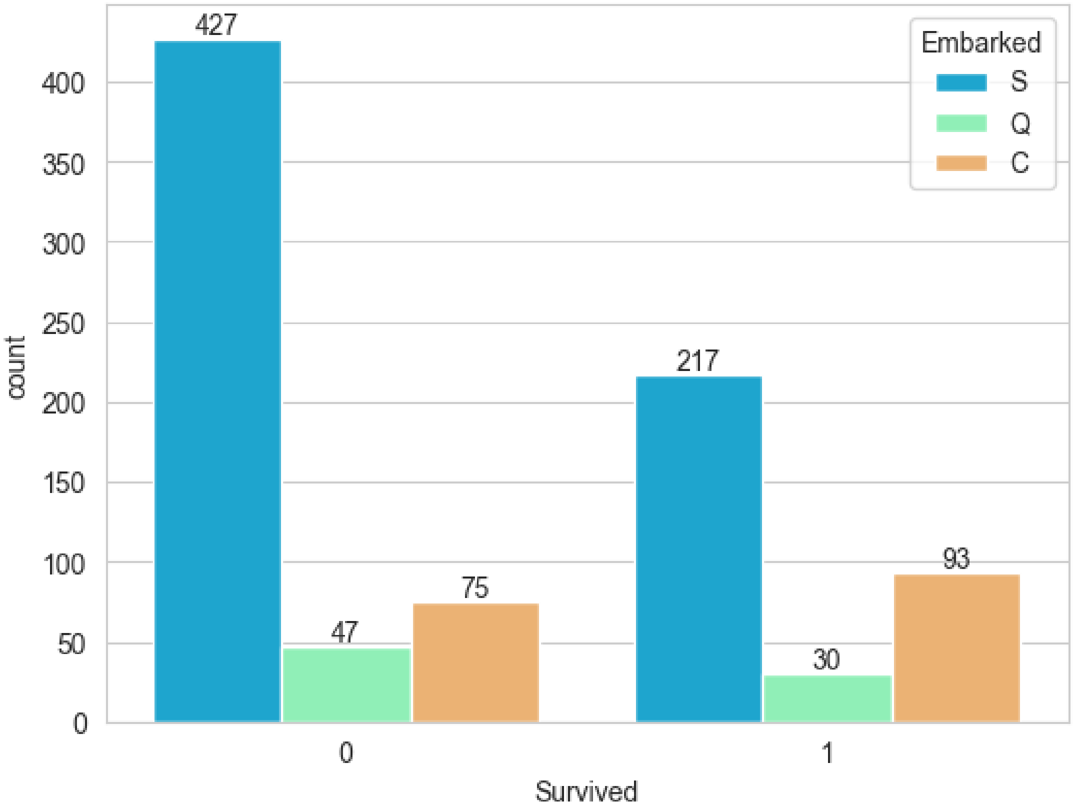
```
C:\Users\computer\AppData\Local\Temp\ipykernel_21000\2132104831.py:2:
FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be
removed in v0.14.0. Assign the `x` variable to `hue` and set
`legend=False` for the same effect.

  ds = sns.countplot(x='Sex',data=data,palette='RdBu_r')
```



Correlation between the port of embarkation (C = Cherbourg, Q = Queenstown, S = Southampton) and survival

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

Embarked
S    644
C    168
Q     77
Name: count, dtype: int64
```

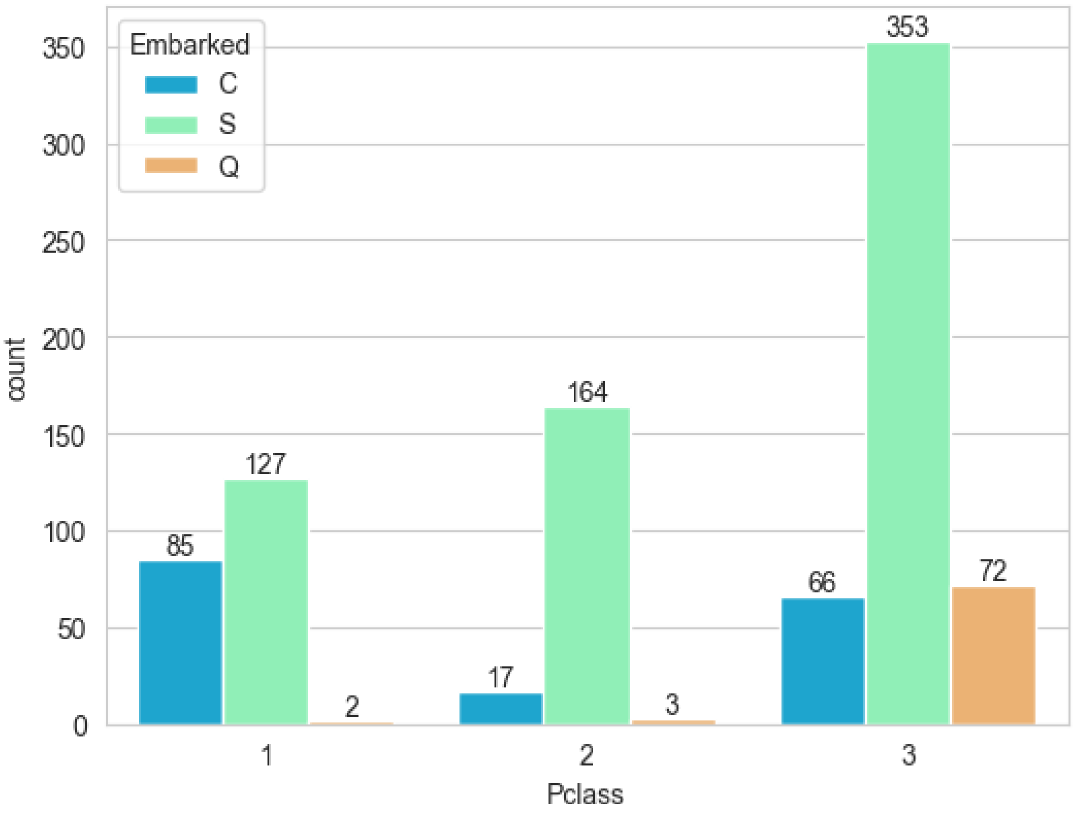
```
sns.set_style('whitegrid')
ds =
sns.countplot(x='Survived',hue='Embarked',data=data,palette='rainbow')
for bars in ds.containers:
    ds.bar_label(bars)
```



Number of Passenger Class with Embarked

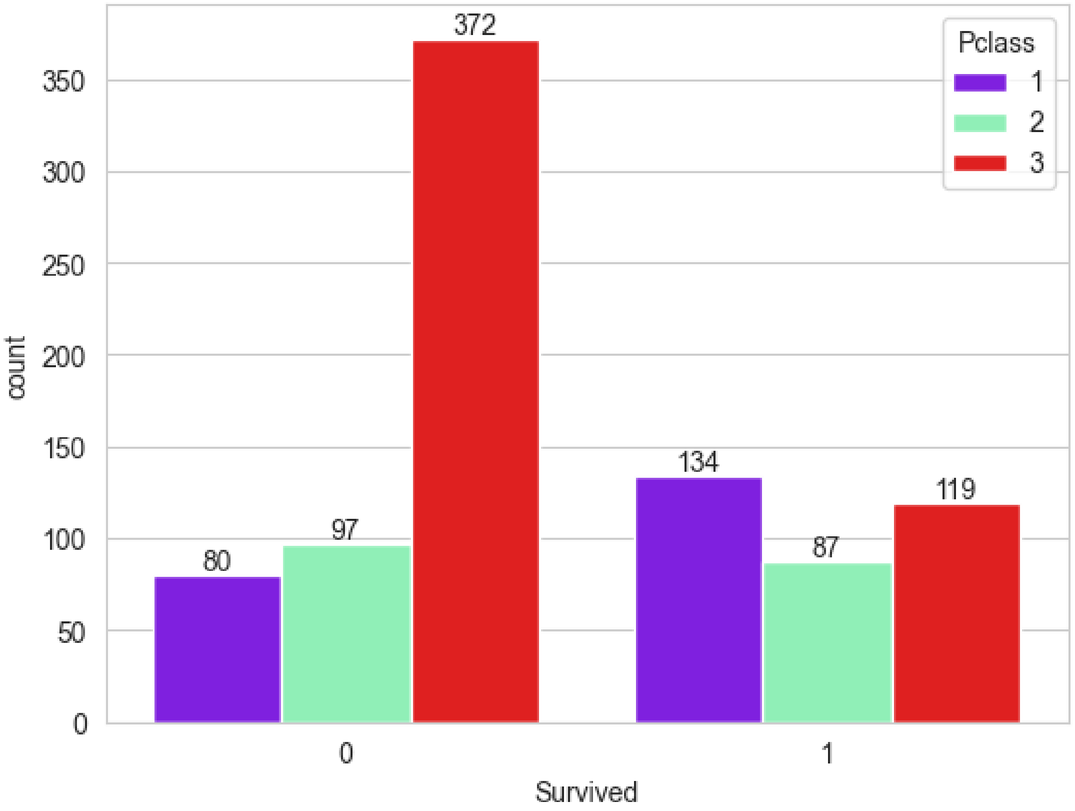
```
data['Pclass'].value_counts()

Pclass
3    491
1    214
2    184
Name: count, dtype: int64
```

```
sns.set_style('whitegrid')
ds =
sns.countplot(x='Pclass',hue='Embarked',data=data,palette='rainbow')
for bars in ds.containers:
    ds.bar_label(bars)
```



Number of Survived from each Passenger Class

```
sns.set_style('whitegrid')
ds = 
sns.countplot(x='Survived',hue='Pclass',data=data,palette='rainbow')
for bars in ds.containers:
    ds.bar_label(bars)
```

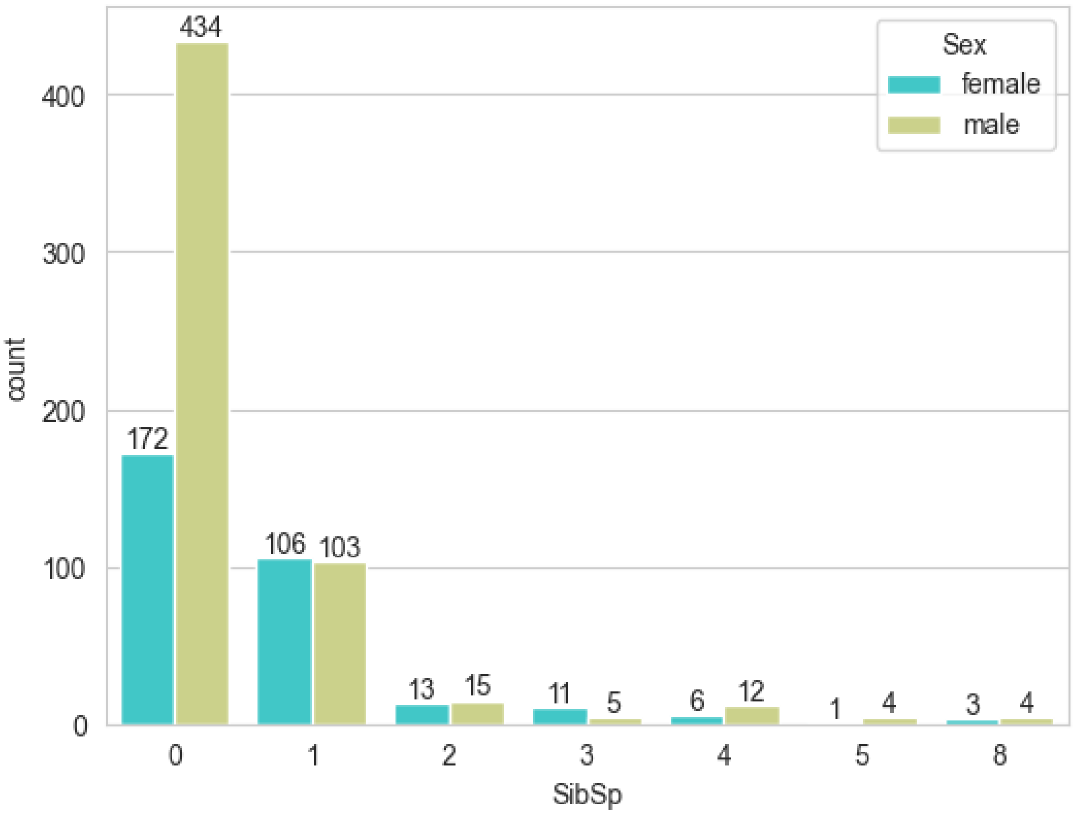


Number of Sibling Spouse on Gender

```
data['SibSp'].value_counts()
```

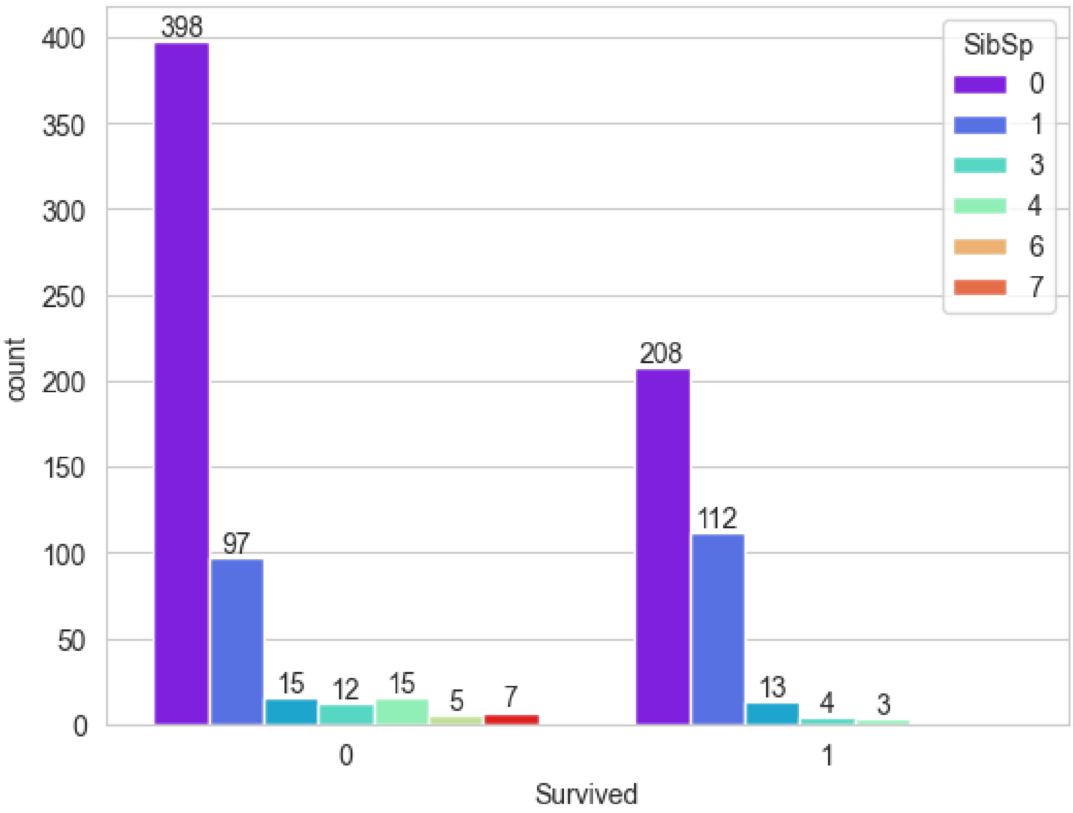
```
SibSp
0    606
1    209
2     28
4     18
3     16
8      7
5      5
Name: count, dtype: int64
```

```
sns.set_style('whitegrid')
ds = sns.countplot(x = 'SibSp',hue='Sex',data=data,palette='rainbow')
for bars in ds.containers:
    ds.bar_label(bars)
```



Member Survived from each Sibling spouse

```
sns.set_style('whitegrid')
ds = sns.countplot(x =
'Survived',hue='SibSp',data=data,palette='rainbow')
for bars in ds.containers:
    ds.bar_label(bars)
```



Max values row wise

```
max_row = data.loc[data['Age'].idxmax()]
max_row

PassengerId                                 631
Survived                                      1
Pclass                                        1
Name           Barkworth, Mr. Algernon Henry Wilson
Sex                                        male
Age                                        80.0
SibSp                                         0
Parch                                         0
Ticket                                    27042
Fare                                       30.0
Embarked                                      S
Name: 630, dtype: object
```

Find the maximum age and corresponding name

```
max_row = data.loc[data['Age'].idxmax()]
max_age = max_row['Age']
max_old_name = max_row['Name']
print(max_age,max_old_name)
```

```
80.0 Barkworth, Mr. Algernon Henry Wilson
```

```
data['Age'].max()
```

```
80.0
```

Find minmum age and their name

```
min_row = data.loc[data['Age'].idxmin()]
min_age = min_row['Age']
min_age_name = min_row['Name']
print(min_age,min_age_name)
```

```
0.42 Thomas, Master. Assad Alexander
```

```
data['Age'].min()
```

```
0.42
```

Find the minimum fare and corresponding name

```
min_fare_row = data.loc[data['Fare'].idxmin()]

min_fare = min_fare_row['Fare']
name_of_min_age = min_fare_row['Name']
print(f"The minimum fare is {min_fare} and the corresponding name is {name_of_min_age}.")
```

```
The minimum fare is 0.0 and the corresponding name is Leonard, Mr. Lionel.
```

Find the maximum fare and corresponding name

```
max_fare_row = data.loc[data['Fare'].idxmax()]

max_fare = max_fare_row['Fare']
name_of_max_age = max_fare_row['Name']

print(f"The maximum fare is {max_fare} and the corresponding name is
{name_of_max_age}.")
```

```
The maximum fare is 512.3292 and the corresponding name is Ward, Miss.
Anna.
```

Get whole information of data

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 889 entries, 0 to 890
Data columns (total 11 columns):
 #   Column       Non-Null Count  Dtype  
---  ------       --------------  -----  
 0   PassengerId  889 non-null    int64  
 1   Survived     889 non-null    int64  
 2   Pclass       889 non-null    int64  
 3   Name         889 non-null    object 
 4   Sex          889 non-null    object 
 5   Age          889 non-null    float64
 6   SibSp        889 non-null    int64  
 7   Parch        889 non-null    int64  
 8   Ticket       889 non-null    object 
 9   Fare         889 non-null    float64
 10  Embarked     889 non-null    object 
dtypes: float64(2), int64(5), object(4)
memory usage: 115.6+ KB
```

Get data only object data types

```
data.select_dtypes(include="object")   # Object Data types
```

```
                                                  Name     Sex  \
0                              Braund, Mr. Owen Harris    male   
1    Cumings, Mrs. John Bradley (Florence Briggs Th...  female   
2                               Heikkinen, Miss. Laina  female   
3         Futrelle, Mrs. Jacques Heath (Lily May Peel)  female   
```

```
4                              Allen, Mr. William Henry    male
..                                                  ...     ...
886                               Montvila, Rev. Juozas    male
887                        Graham, Miss. Margaret Edith  female
888            Johnston, Miss. Catherine Helen "Carrie"  female
889                               Behr, Mr. Karl Howell    male
890                                 Dooley, Mr. Patrick    male

               Ticket Embarked
0           A/5 21171        S
1            PC 17599        C
2    STON/O2. 3101282        S
3              113803        S
4              373450        S
..                ...      ...
886            211536        S
887            112053        S
888        W./C. 6607        S
889            111369        C
890            370376        Q

[889 rows x 4 columns]
```

Get data only integer data type

```
data.select_dtypes(include="int")  # Integer Data Types
```

```
     PassengerId  Survived  Pclass  SibSp  Parch
0              1         0       3      1      0
1              2         1       1      1      0
2              3         1       3      0      0
3              4         1       1      1      0
4              5         0       3      0      0
..           ...       ...     ...    ...    ...
886          887         0       2      0      0
887          888         1       1      0      0
888          889         0       3      1      2
889          890         1       1      0      0
890          891         0       3      0      0

[889 rows x 5 columns]
```

Get data only float data type

```
data.select_dtypes(include="float")   # Float Data Types
```

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

[889 rows x 2 columns]
```

Drop column

```
data.drop(['PassengerId','Name','Ticket'],axis=1,inplace=True)

data
```

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

[889 rows x 8 columns]
```

Convert data type into integer

```
data['Age']= data['Age'].astype('int')
data['Fare'] = data['Fare'].astype('int')

data.dtypes
```

```
Survived     int64
Pclass       int64
Sex         object
Age          int32
SibSp        int64
Parch        int64
Fare         int32
Embarked    object
dtype: object
```

```
en_cod_sex = data["Sex"]
en_cod_Emb = data["Embarked"]
```

Encoding data into bool

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

sex = pd.get_dummies(en_cod_sex).head()

sex
```

```
   female   male
0   False   True
1    True  False
2    True  False
3    True  False
4   False   True
```

```
embarked = pd.get_dummies((en_cod_Emb))
```

Drop first dummy column

```
embarked = pd.get_dummies((en_cod_Emb),drop_first=True)

embarked
```

```
         Q      S
0    False   True
1    False  False
2    False   True
```

```
3    False   True
4    False   True
..     ...    ...
886  False   True
887  False   True
888  False   True
889  False  False
890   True  False

[889 rows x 2 columns]
```

```
sex = pd.get_dummies((en_cod_sex),drop_first=True)
```

```
sex
```

```
      male
0     True
1    False
2    False
3    False
4     True
..     ...
886   True
887  False
888  False
889   True
890   True

[889 rows x 1 columns]
```

```
data
```

```
     Survived  Pclass     Sex  Age  SibSp  Parch  Fare Embarked
0           0       3    male   22      1      0     7        S
1           1       1  female   38      1      0    71        C
2           1       3  female   26      0      0     7        S
3           1       1  female   35      1      0    53        S
4           0       3    male   35      0      0     8        S
..        ...     ...     ...  ...    ...    ...   ...      ...
886         0       2    male   27      0      0    13        S
887         1       1  female   19      0      0    30        S
888         0       3  female   29      1      2    23        S
889         1       1    male   26      0      0    30        C
890         0       3    male   32      0      0     7        Q

[889 rows x 8 columns]
```

Drop those column which use to create dummies column

```
data.drop(['Sex','Embarked'],axis=1,inplace=True)

data

     Survived  Pclass  Age  SibSp  Parch  Fare
0           0       3   22      1      0     7
1           1       1   38      1      0    71
2           1       3   26      0      0     7
3           1       1   35      1      0    53
4           0       3   35      0      0     8
..        ...     ...  ...    ...    ...   ...
886         0       2   27      0      0    13
887         1       1   19      0      0    30
888         0       3   29      1      2    23
889         1       1   26      0      0    30
890         0       3   32      0      0     7

[889 rows x 6 columns]
```

Concatenate dummies column into oringinal data set

```
data = pd.concat([data,sex,embarked],axis=1)
```

Convert whole data into integer data type

```
data = data.astype(int)

data.info()

<class 'pandas.core.frame.DataFrame'>
Index: 889 entries, 0 to 890
Data columns (total 9 columns):
 #   Column    Non-Null Count  Dtype
---  ------    --------------  -----
 0   Survived  889 non-null    int32
 1   Pclass    889 non-null    int32
 2   Age       889 non-null    int32
 3   SibSp     889 non-null    int32
 4   Parch     889 non-null    int32
 5   Fare      889 non-null    int32
 6   male      889 non-null    int32
 7   Q         889 non-null    int32
 8   S         889 non-null    int32
dtypes: int32(9)
memory usage: 70.5 KB
```

```
data
```

```
     Survived  Pclass  Age  SibSp  Parch  Fare  male  Q  S
0           0       3   22      1      0     7     1  0  1
1           1       1   38      1      0    71     0  0  0
2           1       3   26      0      0     7     0  0  1
3           1       1   35      1      0    53     0  0  1
4           0       3   35      0      0     8     1  0  1
..        ...     ...  ...    ...    ...   ...   ... .. ..
886         0       2   27      0      0    13     1  0  1
887         1       1   19      0      0    30     0  0  1
888         0       3   29      1      2    23     0  0  1
889         1       1   26      0      0    30     1  0  0
890         0       3   32      0      0     7     1  1  0

[889 rows x 9 columns]
```

```
X = data.drop(['Survived'],axis=1)
Y = data['Survived']
```

```
X
```

```
     Pclass  Age  SibSp  Parch  Fare  male  Q  S
0         3   22      1      0     7     1  0  1
1         1   38      1      0    71     0  0  0
2         3   26      0      0     7     0  0  1
3         1   35      1      0    53     0  0  1
4         3   35      0      0     8     1  0  1
..      ...  ...    ...    ...   ...   ... .. ..
886       2   27      0      0    13     1  0  1
887       1   19      0      0    30     0  0  1
888       3   29      1      2    23     0  0  1
889       1   26      0      0    30     1  0  0
890       3   32      0      0     7     1  1  0

[889 rows x 8 columns]
```

```
Y
```

```
0      0
1      1
2      1
3      1
4      0
      ..
886    0
```

```
887    1
888    0
889    1
890    0
Name: Survived, Length: 889, dtype: int32
```

Spliting the data into Training data and Test data

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

X.shape,X_train.shape,X_test.shape

((889, 8), (711, 8), (178, 8))
```

Model Training, Logistic regression

```
model = LogisticRegression()

model.fit(X_train, Y_train)

C:\Users\computer\AppData\Local\Programs\Python\Python312\Lib\site-
packages\sklearn\linear_model\_logistic.py:469: ConvergenceWarning:
lbfgs failed to converge (status=1):
STOP: TOTAL NO. of ITERATIONS REACHED LIMIT.

Increase the number of iterations (max_iter) or scale the data as
shown in:
    https://scikit-learn.org/stable/modules/preprocessing.html
Please also refer to the documentation for alternative solver options:

https://scikit-learn.org/stable/modules/linear_model.html#logistic-
regression
  n_iter_i = _check_optimize_result(

LogisticRegression()
```

Model Evaluation

Accuracy Score

```
X_train_pridiction = model.predict(X_train)
```

```
X_train_pridiction
```

```
array([0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0,
0,
       0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0,
1,
       1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 0, 1, 0, 1, 0, 1, 0, 0, 1,
0,
       1, 0, 1, 0, 1, 1, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0,
0,
       0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 1, 0, 1, 1, 1, 0, 1, 0, 0, 0, 1,
0,
       0, 1, 0, 1, 0, 0, 1, 0, 0, 1, 0, 0, 1, 1, 0, 1, 0, 1, 1, 1, 0,
0,
       0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 1, 1, 1, 0, 1,
1,
       0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 1,
0,
       0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 0, 1, 1, 1, 0, 1, 0, 1, 0, 0, 1,
0,
       1, 1, 0, 1, 1, 1, 0, 1, 1, 1, 1, 1, 1, 0, 0, 1, 1, 0, 0, 0, 0,
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       0, 0, 1, 0, 0, 0, 1, 0, 1, 0, 0, 0, 1, 1, 1, 1, 1, 0, 0, 1, 0,
0,
       0, 0, 1, 1, 0, 0, 0, 1, 0, 1, 0, 0, 1, 0, 0, 0, 0, 0, 1, 1, 0,
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       1, 0, 0, 0, 1, 0, 0, 1, 1, 0, 0, 0, 1, 1, 1, 0, 0, 0, 1, 0, 0,
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       1, 1, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0,
0,
       0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1,
1,
       0, 0, 1, 1, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0,
1,
       1, 1, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0, 0, 0,
0,
       0, 0, 1, 1, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 1, 0, 0, 0, 0, 0, 0,
0,
       0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 0, 0, 1, 0, 0,
1,
       0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 1, 1, 0, 0, 1, 0, 0, 0, 0, 1,
1,
       1, 1, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0,
0,
       1, 1, 0, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 1, 1, 1, 0,
0,
       1, 0, 0, 0, 1, 0, 1, 1, 0, 0, 1, 0, 1, 1, 0, 0, 0, 1, 0, 1, 0,
0,
       0, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 0, 1, 0, 0, 1, 0, 0, 1, 0,
0,
       0, 1, 1, 1, 0, 0, 0, 1, 1, 1, 0, 1, 1, 0, 1, 0, 1, 1, 0, 0, 1,
1,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 1, 1, 0, 0, 0,
1,
       1, 0, 0, 0, 0, 0, 1, 0, 1, 1, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0,
0,
       0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 1, 1, 0, 1, 0, 0, 0, 1, 0,
0,
       0, 1, 1, 1, 0, 0, 1, 1, 1, 0, 1, 0, 0, 1, 1, 1, 0, 0, 1, 1, 1,
1,
       1, 0, 1, 1, 1, 0, 0, 1, 0, 1, 0, 1, 0, 0, 1, 1, 0, 1, 1, 0, 0,
1,
       0, 0, 1, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 1, 1,
0,
       0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 1, 0, 0, 1, 0,
0,
       0, 1, 1, 1, 0, 0, 0])
```

Comparing training data

Accuracy on train data

```
training_data_accuracy = accuracy_score(Y_train,X_train_pridiction)
print('Accuracy Score of training data: ',training_data_accuracy)
```

```
Accuracy Score of training data:  0.8045007032348804
```

```
X_test_pridiction = model.predict(X_test)
X_test_pridiction
```

```
array([0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 1, 0, 1,
0,
       1, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 1, 0, 1, 1, 1, 0, 0, 0, 1, 1,
0,
       0, 1, 1, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 0, 0, 0,
0,
       1, 0, 0, 1, 0, 0, 0, 0, 1, 1, 1, 1, 0, 0, 0, 1, 0, 1, 1, 0, 1,
0,
       0, 0, 1, 0, 0, 0, 1, 0, 1, 0, 0, 0, 1, 1, 0, 1, 0, 1, 1, 1, 0,
0,
       1, 0, 0, 0, 1, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0,
0,
       1, 1, 0, 0, 0, 1, 0, 0, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0,
1,
       1, 0, 1, 0, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 1, 0, 0, 1, 1, 1, 0,
0,
       0, 0])
```

Accuracy on test data

```
X_test_accuracy = accuracy_score(Y_test, X_test_pridiction)
print('Accuracy Score of test data: ',X_test_accuracy)

Accuracy Score of test data:  0.797752808988764
```