Rahul Sunil Agrawal

TE COMP2

TC202

Titanic Dataset Preprocessing

In [1]:
```
# Importing Libreries

import numpy as np
import pandas as pd

import matplotlib.pyplot as plt

from sklearn.preprocessing import MinMaxScaler
from sklearn import preprocessing

import seaborn as sns

from sklearn.metrics import confusion_matrix
```

In [2]:
```
# Loading Dataset

all_df = pd.read_csv('titanic.csv')
```

Cleaning Data

In [3]:
```
# cheaking the dataset

all_df.shape
```

Out[3]: (891, 12)

In [4]:
```
all_df
```

Out[4]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarke
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C85	
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	NaN	
...	...	...	...	...	...	...	...	...	...	...	...	
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536	13.0000	NaN	
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0000	B42	
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	NaN	1	2	W./C. 6607	23.4500	NaN	
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.0000	C148	
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.7500	NaN	

891 rows × 12 columns

In [5]:
```
all_df.columns
```

Out[5]:
```
Index(['PassengerId', 'Survived', 'Pclass', 'Name', 'Sex', 'Age', 'SibSp',
       'Parch', 'Ticket', 'Fare', 'Cabin', 'Embarked'],
      dtype='object')
```

In [6]:
```
#  Unwanted column List

droping_columns = ['PassengerId', 'Name', 'Ticket', 'Cabin']
```

In [7]:
```
#  make new dataframe with only important columns

df= all_df.drop(droping_columns,axis=1)
```

In [8]:
```
#  new dataframe rows*columns

df.shape
```

Out[8]: (891, 8)

In [9]:
```
df
```

Out[9]:

	Survived	Pclass	Sex	Age	SibSp	Parch	Fare	Embarked
0	0	3	male	22.0	1	0	7.2500	S
1	1	1	female	38.0	1	0	71.2833	C
2	1	3	female	26.0	0	0	7.9250	S
3	1	1	female	35.0	1	0	53.1000	S
4	0	3	male	35.0	0	0	8.0500	S
...	...	...	...	...	...	...	...	...
886	0	2	male	27.0	0	0	13.0000	S
887	1	1	female	19.0	0	0	30.0000	S
888	0	3	female	NaN	1	2	23.4500	S
889	1	1	male	26.0	0	0	30.0000	C
890	0	3	male	32.0	0	0	7.7500	Q

891 rows × 8 columns

In [10]:
```
#    Get all Unique values of each column

for col in df:
    if(len(df[col].unique())>10):
        continue
    print(col)
    print(df[col].unique())
```

```
Survived
[0 1]
Pclass
[3 1 2]
Sex
['male' 'female']
SibSp
[1 0 3 4 2 5 8]
Parch
[0 1 2 5 3 4 6]
Embarked
['S' 'C' 'Q' nan]
```

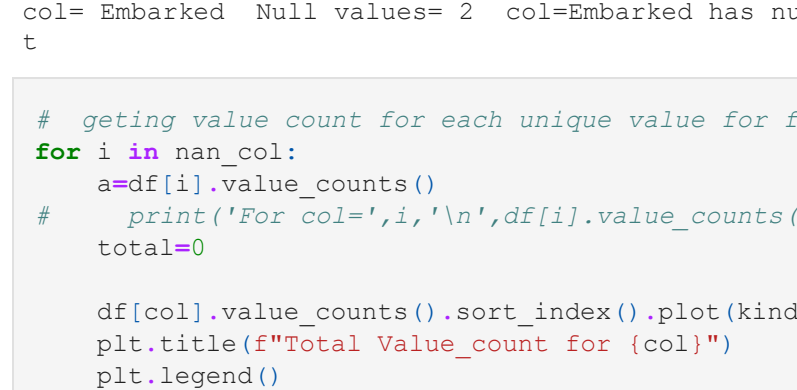
In [11]:
```
#  Get Datatypes Of each Columns
dtype={}
for col in df:
    dtype[col]=df[col].dtypes
#     print(f'col={col} , Datatype=',df[col].dtypes)

dtype
```

Out[11]:
```
{'Survived': dtype('int64'),
 'Pclass': dtype('int64'),
 'Sex': dtype('O'),
 'Age': dtype('float64'),
 'SibSp': dtype('int64'),
 'Parch': dtype('int64'),
 'Fare': dtype('float64'),
 'Embarked': dtype('O')}
```

In [12]:
```
#  Get total Null Values inside Columns and fill it with mean value of that column if

nan_col=[]

for col in df:
    total=df[col].isnull().sum()
    if(total>0):
        print('col=',col,' Null values=',total , end='  ')
        if(dtype[col]!='O'):          #For int , float Datatype
            mean_value=df[col].mean()
            print("Filling Null Values With Mean=",mean_value)
            df[col].fillna(value=mean_value,inplace=True)
        else:
            print(f'col={col} has null values remaing due to dtype=Object')
            nan_col.append(col)
```

```
col= Age  Null values= 177  Filling Null Values With Mean= 29.69911764705882
col= Embarked  Null values= 2  col=Embarked has null values remaing due to dtype=Objec
t
```

In [13]:
```
#  geting value count for each unique value for filling null values
for i in nan_col:
    a=df[i].value_counts()
#     print('For col=',i,'\n',df[i].value_counts())
    total=0

    df[col].value_counts().sort_index().plot(kind='bar', rot=0, ylabel='count' , xlabe
    plt.title(f"Total Value_count for {col}")
    plt.legend()
    plt.show()
```



In [14]:
```
# Filling Nan values with most occured Value i.e.  "S"


df['Embarked'].fillna(value='S',inplace=True)
```

Preprocessing Data

In [15]:
```
d=df
df
```

Out[15]:

	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

891 rows × 8 columns

In [16]:
```
# Encoding Data i.e. Converting dtype Object to int

#  Get column name having object datatype

encode_col=[]
for j in dtype:
    if(dtype[j]=='object'):
        encode_col.append(j)
print('columns to be Encoded')
print(encode_col)
```

```
columns to be Encoded
['Sex', 'Embarked']
```

In [17]:
```
#  Prechecking values

print(d['Sex'].unique())
print(d['Sex'].value_counts())
```

```
['male' 'female']
male      577
female    314
Name: Sex, dtype: int64
```

In [18]:
```
#  As column 'Sex' having 2 catagories so we will use label encoding

df.replace(['female'],1,inplace=True)
df.replace(['male'],0,inplace=True)

print(d['Sex'].unique())
print(d['Sex'].value_counts())
```

```
[0 1]
0    577
1    314
Name: Sex, dtype: int64
```

In [19]:
```
#  For column 'Embarked' , we have more than 2 catagories so using one_hot encoding h

df=pd.get_dummies(df, columns = ['Embarked'])
```

In [20]:
```
df
```

Out[20]:

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

891 rows × 10 columns

In [21]:
```
df.columns
```

Out[21]:
```
Index(['Survived', 'Pclass', 'Sex', 'Age', 'SibSp', 'Parch', 'Fare',
       'Embarked_C', 'Embarked_Q', 'Embarked_S'],
      dtype='object')
```

Insights from Data

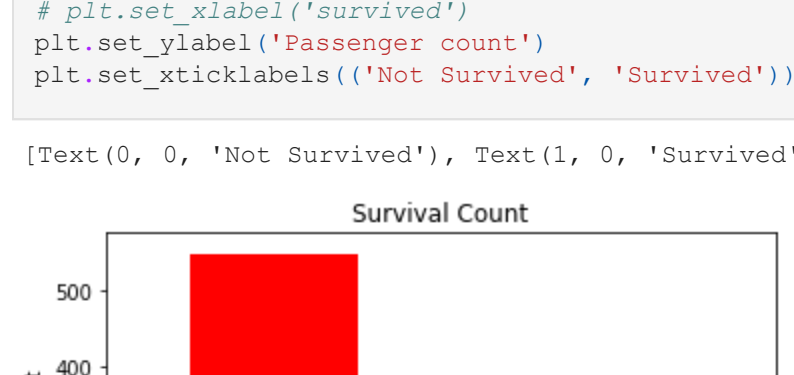
In [22]:
```
#  Co-Reletion Matrix

df.corr()
```

Out[22]:

	Survived	Pclass	Sex	Age	SibSp	Parch	Fare	Embarked_C	Embarke
Survived	1.000000	-0.338481	0.543351	-0.069809	-0.035322	0.081629	0.257307	0.168240	0.003
Pclass	-0.338481	1.000000	-0.131900	-0.331339	0.083081	0.018443	-0.549500	-0.243292	0.221
Sex	0.543351	-0.131900	1.000000	-0.084153	0.114631	0.245489	0.182333	0.082853	0.074
Age	-0.069809	-0.331339	-0.084153	1.000000	-0.232625	-0.179191	0.091566	0.032024	-0.013
SibSp	-0.035322	0.083081	0.114631	-0.232625	1.000000	0.414838	0.159651	-0.059528	-0.026
Parch	0.081629	0.018443	0.245489	-0.179191	0.414838	1.000000	0.216225	-0.011069	-0.081
Fare	0.257307	-0.549500	0.182333	0.091566	0.159651	0.216225	1.000000	0.269335	-0.117
Embarked_C	0.168240	-0.243292	0.082853	0.032024	-0.059528	-0.011069	0.269335	1.000000	-0.148
Embarked_Q	0.003650	0.221009	0.074115	-0.013855	-0.026354	-0.081228	-0.117216	-0.148258	1.000
Embarked_S	-0.149683	0.074053	-0.119224	-0.019336	0.068734	0.060814	-0.162184	-0.782742	-0.499

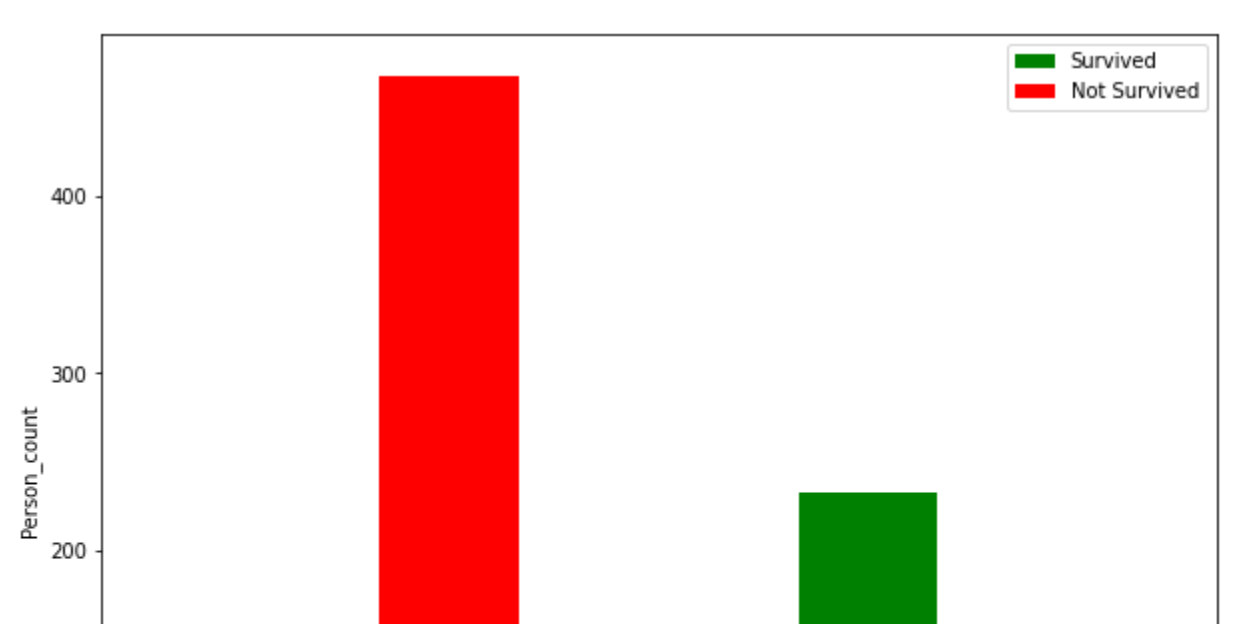
In [23]:
```
plt=df.Survived.value_counts().plot(kind='bar',rot=0,color=['r', 'g'])
plt.set_title("Survival Count")
# plt.set_xlabel('survived')
plt.set_ylabel('Passenger count')
plt.set_xticklabels(('Not Survived', 'Survived'))
```

Out[23]: [Text(0, 0, 'Not Survived'), Text(1, 0, 'Survived')]

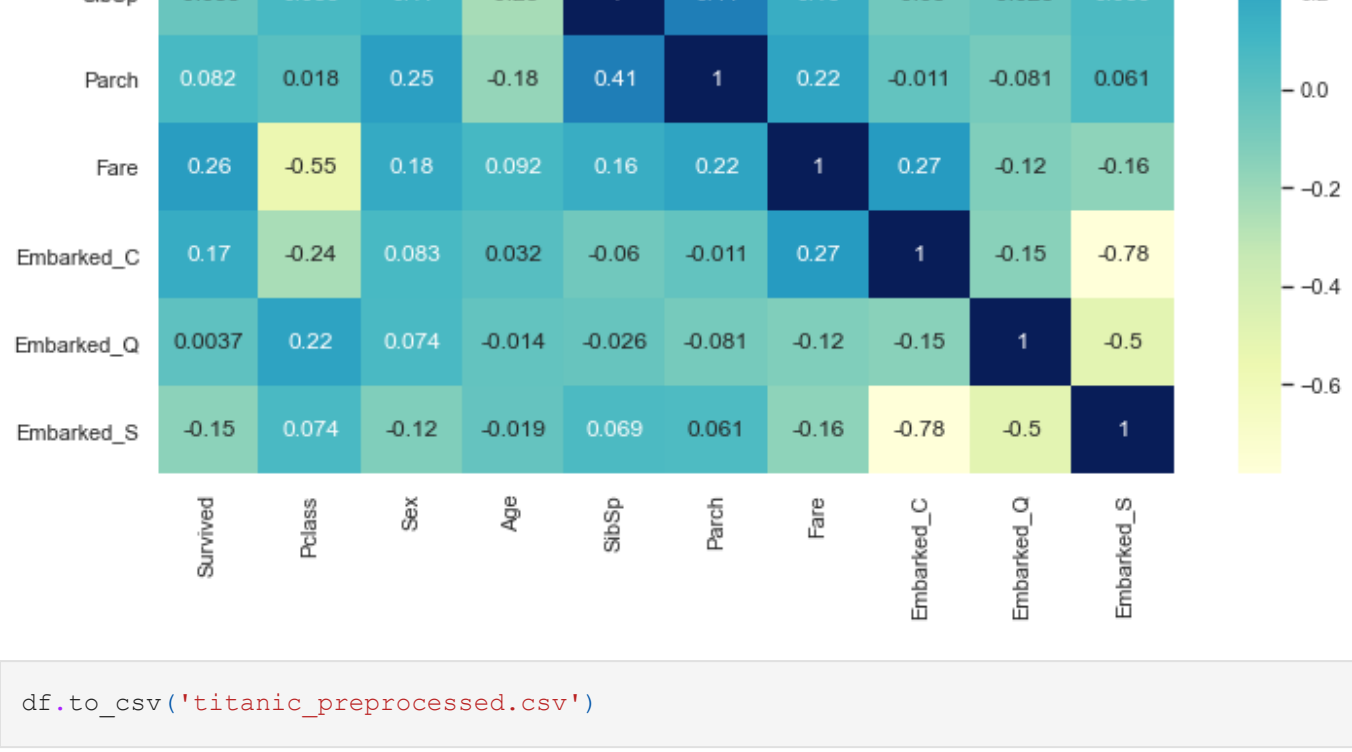


In [24]:
```
#   Male , Female Survival Count

ms=mns=fs=fns=0


for i in range(df.shape[0]):
    if df.Sex[i]==0:
        if (df['Survived'][i]==0):
            mns=mns+1
        else:
            ms=ms+1
    else:
        if (df.Survived==0)[i]:
            fns=fns+1
        else:
            fs=fs+1
Sex=["Male","Female"]
Survival={
    "Survived":[ms,fs],
    "Not Survived":[mns,fns]

}
ndf=pd.DataFrame(Survival,index=Sex)

ndf.plot(kind="bar",figsize=(10,8),rot=0,color=['g','r'],xlabel='Gender',ylabel='Pers
plt.legend(loc="lower left",bbox_to_anchor=(0.8,1.0))
```

Out[24]:
```
<matplotlib.legend.Legend at 0x1bec1fe9eb0>
```



In [25]:
```
sns.set(rc={'figure.figsize':(11.7,8.27)})


dataplot = sns.heatmap(df.corr(), cmap="YlGnBu", annot=True).set(title='CoReletion  Ma
```



In [26]:
```
df.to_csv('titanic_preprocessed.csv')
```

In [ ]: