In [ ]:
```
Text
```

TITANIC Data Preprocessing

In [1]:
```
import pandas as pd
import numpy as np
```

In [3]:
```
titanic = pd.read_csv(r"E:\Data Science & AI\Dataset files\titanic dataset.csv")
```

In [5]:
```
titanic
```

Out[5]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	7
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	5
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	
...	...	...	...	...	...	...	...	...	...	
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536	1
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	3
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	NaN	1	2	W./C. 6607	2
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	3
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	

891 rows × 12 columns

In [7]:
```
titanic.tail()
```

Out[7]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Far
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536	13.0
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	NaN	1	2	W./C. 6607	23.4
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.0
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.7

In [9]:
```
titanic.head()
```

Out[9]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	F
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0

Performing Data Cleaning and Analysis Understanding meaning of each column: Data Dictionary: Variable Description Survived - Survived (1) or died (0) Pclass - Passenger's class (1 = 1st, 2 = 2nd, 3 = 3rd) Name - Passenger's name Sex - Passenger's sex Age - Passenger's age SibSp - Number of siblings/spouses aboard Parch - Number of parents/children aboard

(Some children travelled only with a nanny, therefore parch=0 for them.) Ticket - Ticket number Fare - Fare Cabin - Cabin Embarked - Port of embarkation (C = Cherbourg, Q = Queenstown, S = Southampton)

In [12]:
```
titanic.describe()
```

Out[12]:

	PassengerId	Survived	Pclass	Age	SibSp	Parch	
count	891.000000	891.000000	891.000000	714.000000	891.000000	891.000000	891.00
mean	446.000000	0.383838	2.308642	29.699118	0.523008	0.381594	32.204
std	257.353842	0.486592	0.836071	14.526497	1.102743	0.806057	49.693
min	1.000000	0.000000	1.000000	0.420000	0.000000	0.000000	0.00
25%	223.500000	0.000000	2.000000	20.125000	0.000000	0.000000	7.91
50%	446.000000	0.000000	3.000000	28.000000	0.000000	0.000000	14.454
75%	668.500000	1.000000	3.000000	38.000000	1.000000	0.000000	31.00
max	891.000000	1.000000	3.000000	80.000000	8.000000	6.000000	512.329

In [14]:
```
#Name column can never decide survival of a person, hence we can safely delete i

del titanic["Name"]
```

In [16]:
```
del titanic["Ticket"]
```

In [18]:
```
del titanic["Fare"]
```

In [20]:
```
del titanic['Cabin']
```

In [22]:
```
titanic.head()
```

Out[22]:

	PassengerId	Survived	Pclass	Sex	Age	SibSp	Parch	Embarked
0	1	0	3	male	22.0	1	0	S
1	2	1	1	female	38.0	1	0	C
2	3	1	3	female	26.0	0	0	S
3	4	1	1	female	35.0	1	0	S
4	5	0	3	male	35.0	0	0	S

In [24]:
```
# Changing Value for "Male, Female" string values to numeric values , male=1 and
def getNumber(str):
    if str=="male":
        return 1
    else:
        return 2
titanic["Gender"]=titanic["Sex"].apply(getNumber)
```

In [26]:
```
titanic.head()
```

Out[26]:

	PassengerId	Survived	Pclass	Sex	Age	SibSp	Parch	Embarked	Gender
0	1	0	3	male	22.0	1	0	S	1
1	2	1	1	female	38.0	1	0	C	2
2	3	1	3	female	26.0	0	0	S	2
3	4	1	1	female	35.0	1	0	S	2
4	5	0	3	male	35.0	0	0	S	1

In [28]:

```
#Deleting Sex column, since no use of it now
del titanic["Sex"]
```

In [30]:

```
titanic.head()
```

Out[30]:

	PassengerId	Survived	Pclass	Age	SibSp	Parch	Embarked	Gender
0	1	0	3	22.0	1	0	S	1
1	2	1	1	38.0	1	0	C	2
2	3	1	3	26.0	0	0	S	2
3	4	1	1	35.0	1	0	S	2
4	5	0	3	35.0	0	0	S	1

In [32]:

```
titanic.isnull().sum()
```

Out[32]:

```
PassengerId      0
Survived         0
Pclass           0
Age            177
SibSp            0
Parch            0
Embarked         2
Gender           0
dtype: int64
```

In [34]:

```
means= titanic[titanic.Survived==1].Age.mean()
means
```

Out[34]:

```
28.343689655172415
```

In [36]:

```
titanic["age"]=np.where(pd.isnull(titanic.Age) & titanic["Survived"]==1  ,means,
titanic.head()
```

Out[36]:

	PassengerId	Survived	Pclass	Age	SibSp	Parch	Embarked	Gender	age
0	1	0	3	22.0	1	0	S	1	22.0
1	2	1	1	38.0	1	0	C	2	38.0
2	3	1	3	26.0	0	0	S	2	26.0
3	4	1	1	35.0	1	0	S	2	35.0
4	5	0	3	35.0	0	0	S	1	35.0

In [38]:
```
titanic.isnull().sum()
```

Out[38]:
```
PassengerId      0
Survived         0
Pclass           0
Age            177
SibSp            0
Parch            0
Embarked         2
Gender           0
age            125
dtype: int64
```

In [40]:
```
# Finding the mean age of "Not Survived" people

means1=titanic[titanic.Survived==0].Age.mean()
means1
```

Out[40]:
```
30.62617924528302
```

In [44]:
```
titanic.age.fillna(means1,inplace=True)
```

```
C:\Users\roy62\AppData\Local\Temp\ipykernel_11016\2890245544.py:1: FutureWarning:
A value is trying to be set on a copy of a DataFrame or Series through chained as
signment using an inplace method.
The behavior will change in pandas 3.0. This inplace method will never work becau
se the intermediate object on which we are setting values always behaves as a cop
y.

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.meth
od({col: value}, inplace=True)' or df[col] = df[col].method(value) instead, to pe
rform the operation inplace on the original object.


  titanic.age.fillna(means1,inplace=True)
```

In [46]:
```
titanic.head()
```

Out[46]:

	PassengerId	Survived	Pclass	Age	SibSp	Parch	Embarked	Gender	age
0	1	0	3	22.0	1	0	S	1	22.0
1	2	1	1	38.0	1	0	C	2	38.0
2	3	1	3	26.0	0	0	S	2	26.0
3	4	1	1	35.0	1	0	S	2	35.0
4	5	0	3	35.0	0	0	S	1	35.0

In [48]:
```
titanic.isnull().sum()
```

Out[48]:
```
PassengerId      0
Survived         0
Pclass           0
Age            177
SibSp            0
Parch            0
Embarked         2
Gender           0
age              0
dtype: int64
```

In [50]:
```
del titanic['Age']
titanic.head()
```

Out[50]:

	PassengerId	Survived	Pclass	SibSp	Parch	Embarked	Gender	age
0	1	0	3	1	0	S	1	22.0
1	2	1	1	1	0	C	2	38.0
2	3	1	3	0	0	S	2	26.0
3	4	1	1	1	0	S	2	35.0
4	5	0	3	0	0	S	1	35.0

In [52]:
```
# Finding the number of people who have survived
# given that they have embarked or boarded from a particular port

survivedQ = titanic[titanic.Embarked == 'Q'][titanic.Survived == 1].shape[0]
survivedC = titanic[titanic.Embarked == 'C'][titanic.Survived == 1].shape[0]
survivedS = titanic[titanic.Embarked == 'S'][titanic.Survived == 1].shape[0]
print(survivedQ)
print(survivedC)
print(survivedS)
```

```
30
93
217
```

```
C:\Users\roy62\AppData\Local\Temp\ipykernel_11016\3300902897.py:4: UserWarning: B
oolean Series key will be reindexed to match DataFrame index.
  survivedQ = titanic[titanic.Embarked == 'Q'][titanic.Survived == 1].shape[0]
C:\Users\roy62\AppData\Local\Temp\ipykernel_11016\3300902897.py:5: UserWarning: B
oolean Series key will be reindexed to match DataFrame index.
  survivedC = titanic[titanic.Embarked == 'C'][titanic.Survived == 1].shape[0]
C:\Users\roy62\AppData\Local\Temp\ipykernel_11016\3300902897.py:6: UserWarning: B
oolean Series key will be reindexed to match DataFrame index.
  survivedS = titanic[titanic.Embarked == 'S'][titanic.Survived == 1].shape[0]
```

In [54]:
```
survivedQ = titanic[titanic.Embarked == 'Q'][titanic.Survived == 0].shape[0]
survivedC = titanic[titanic.Embarked == 'C'][titanic.Survived == 0].shape[0]
survivedS = titanic[titanic.Embarked == 'S'][titanic.Survived == 0].shape[0]
print(survivedQ)
print(survivedC)
print(survivedS)
```

```
47
75
427
```

```
C:\Users\roy62\AppData\Local\Temp\ipykernel_11016\3240960939.py:1: UserWarning: B
oolean Series key will be reindexed to match DataFrame index.
  survivedQ = titanic[titanic.Embarked == 'Q'][titanic.Survived == 0].shape[0]
C:\Users\roy62\AppData\Local\Temp\ipykernel_11016\3240960939.py:2: UserWarning: B
oolean Series key will be reindexed to match DataFrame index.
  survivedC = titanic[titanic.Embarked == 'C'][titanic.Survived == 0].shape[0]
C:\Users\roy62\AppData\Local\Temp\ipykernel_11016\3240960939.py:3: UserWarning: B
oolean Series key will be reindexed to match DataFrame index.
  survivedS = titanic[titanic.Embarked == 'S'][titanic.Survived == 0].shape[0]
```

In [58]:
```
titanic.dropna(inplace=True)
titanic.head()
```

Out[58]:

	PassengerId	Survived	Pclass	SibSp	Parch	Embarked	Gender	age
0	1	0	3	1	0	S	1	22.0
1	2	1	1	1	0	C	2	38.0
2	3	1	3	0	0	S	2	26.0
3	4	1	1	1	0	S	2	35.0
4	5	0	3	0	0	S	1	35.0

In [60]:
```
titanic.isnull().sum()
```

Out[60]:
```
PassengerId    0
Survived       0
Pclass         0
SibSp          0
Parch          0
Embarked       0
Gender         0
age            0
dtype: int64
```

In [62]:
```
#Renaming "age" and "gender" columns
```

```
titanic.rename(columns={'age':'Age'}, inplace=True)
titanic.head()
```

Out[62]:

	PassengerId	Survived	Pclass	SibSp	Parch	Embarked	Gender	Age
0	1	0	3	1	0	S	1	22.0
1	2	1	1	1	0	C	2	38.0
2	3	1	3	0	0	S	2	26.0
3	4	1	1	1	0	S	2	35.0
4	5	0	3	0	0	S	1	35.0

In [64]:

```
titanic.rename(columns={'Gender':'Sex'}, inplace=True)
```

In [66]:

```
titanic.head()
```

Out[66]:

	PassengerId	Survived	Pclass	SibSp	Parch	Embarked	Sex	Age
0	1	0	3	1	0	S	1	22.0
1	2	1	1	1	0	C	2	38.0
2	3	1	3	0	0	S	2	26.0
3	4	1	1	1	0	S	2	35.0
4	5	0	3	0	0	S	1	35.0

In [68]:

```
def getEmb(str):
    if str=="S":
        return 1
    elif str=='Q':
        return 2
    else:
        return 3
titanic["Embark"]=titanic["Embarked"].apply(getEmb)
titanic.head()
```

Out[68]:

	PassengerId	Survived	Pclass	SibSp	Parch	Embarked	Sex	Age	Embark
0	1	0	3	1	0	S	1	22.0	1
1	2	1	1	1	0	C	2	38.0	3
2	3	1	3	0	0	S	2	26.0	1
3	4	1	1	1	0	S	2	35.0	1
4	5	0	3	0	0	S	1	35.0	1

In [70]:

```
del titanic['Embarked']
titanic.rename(columns={'Embark':'Embarked'}, inplace=True)
titanic.head()
```

Out[70]:

	PassengerId	Survived	Pclass	SibSp	Parch	Sex	Age	Embarked
0	1	0	3	1	0	1	22.0	1
1	2	1	1	1	0	2	38.0	3
2	3	1	3	0	0	2	26.0	1
3	4	1	1	1	0	2	35.0	1
4	5	0	3	0	0	1	35.0	1

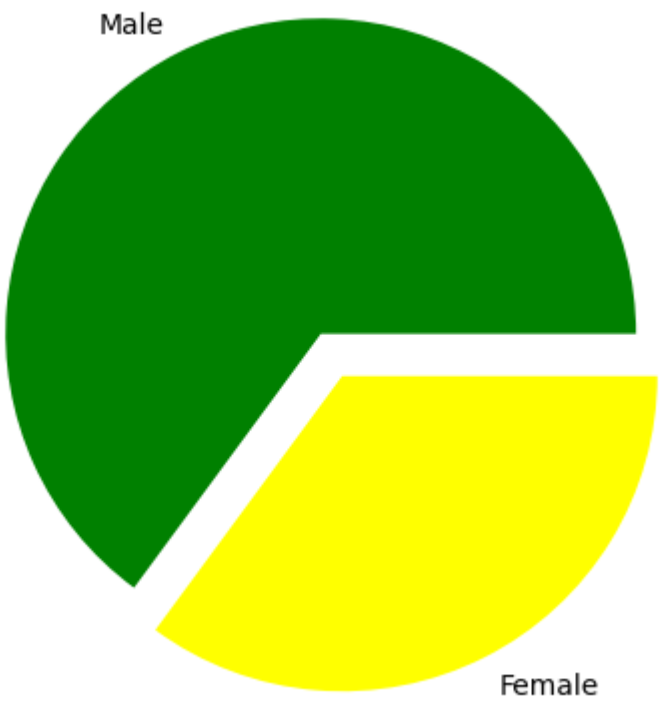
In [72]:

```
#Drawing a pie chart for number of males and females aboard

import matplotlib.pyplot as plt
from matplotlib import style

males = (titanic['Sex'] == 1).sum()
#Summing up all the values of column gender with a
#condition for male and similary for females
females = (titanic['Sex'] == 2).sum()
print(males)
print(females)
p = [males, females]
plt.pie(p,    #giving array
       labels = ['Male', 'Female'], #Correspndingly giving labels
       colors = ['green', 'yellow'],   # Corresponding colors
       explode = (0.15, 0),    #How much the gap should me there between the pie
       startangle = 0)  #what start angle should be given
plt.axis('equal')
plt.show()
```

```
577
312
```



In [74]:

```
# More Precise Pie Chart
```

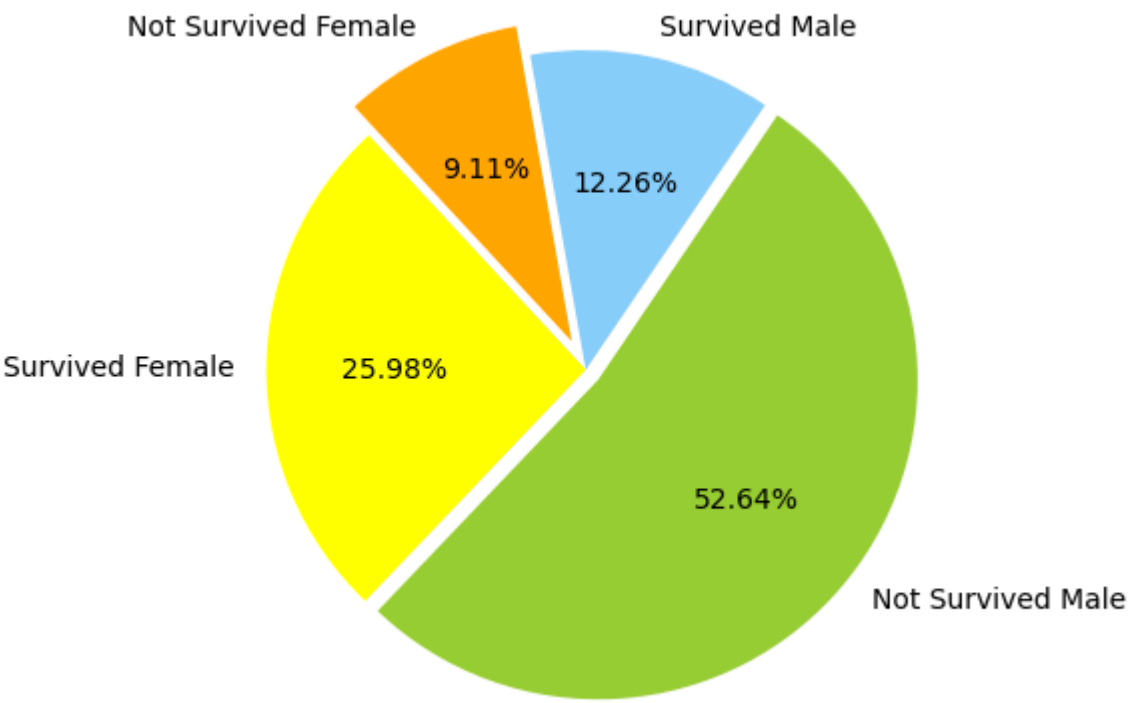
```
MaleS=titanic[titanic.Sex==1][titanic.Survived==1].shape[0]
print(MaleS)
MaleN=titanic[titanic.Sex==1][titanic.Survived==0].shape[0]
print(MaleN)
FemaleS=titanic[titanic.Sex==2][titanic.Survived==1].shape[0]
print(FemaleS)
FemaleN=titanic[titanic.Sex==2][titanic.Survived==0].shape[0]
print(FemaleN)
```

```
109
468
231
81
```

```
C:\Users\roy62\AppData\Local\Temp\ipykernel_11016\2810620594.py:3: UserWarning: B
oolean Series key will be reindexed to match DataFrame index.
  MaleS=titanic[titanic.Sex==1][titanic.Survived==1].shape[0]
C:\Users\roy62\AppData\Local\Temp\ipykernel_11016\2810620594.py:5: UserWarning: B
oolean Series key will be reindexed to match DataFrame index.
  MaleN=titanic[titanic.Sex==1][titanic.Survived==0].shape[0]
C:\Users\roy62\AppData\Local\Temp\ipykernel_11016\2810620594.py:7: UserWarning: B
oolean Series key will be reindexed to match DataFrame index.
  FemaleS=titanic[titanic.Sex==2][titanic.Survived==1].shape[0]
C:\Users\roy62\AppData\Local\Temp\ipykernel_11016\2810620594.py:9: UserWarning: B
oolean Series key will be reindexed to match DataFrame index.
  FemaleN=titanic[titanic.Sex==2][titanic.Survived==0].shape[0]
```

In [76]:

```
chart=[MaleS,MaleN,FemaleS,FemaleN]
colors=['lightskyblue','yellowgreen','Yellow','Orange']
labels=["Survived Male","Not Survived Male","Survived Female","Not Survived Fema
explode=[0,0.05,0,0.1]
plt.pie(chart,labels=labels,colors=colors,explode=explode,startangle=100,counter
plt.axis("equal")
plt.show()
```



In [ ]: