

```
In [1]: import pandas as pd
import warnings
warnings.filterwarnings("ignore")
```

```
In [2]: data=pd.read_csv("/home/placement/Downloads/Titanic Dataset.csv")
```

```
In [3]: data
```

```
Out[3]:
```

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

891 rows × 12 columns

```
In [4]: data.describe()
```

```
Out[4]:
```

	PassengerId	Survived	Pclass	Age	SibSp	Parch	Fare
count	891.000000	891.000000	891.000000	714.000000	891.000000	891.000000	891.000000
mean	446.000000	0.383838	2.308642	29.699118	0.523008	0.381594	32.204208
std	257.353842	0.486592	0.836071	14.526497	1.102743	0.806057	49.693429
min	1.000000	0.000000	1.000000	0.420000	0.000000	0.000000	0.000000
25%	223.500000	0.000000	2.000000	20.125000	0.000000	0.000000	7.910400
50%	446.000000	0.000000	3.000000	28.000000	0.000000	0.000000	14.454200
75%	668.500000	1.000000	3.000000	38.000000	1.000000	0.000000	31.000000
max	891.000000	1.000000	3.000000	80.000000	8.000000	6.000000	512.329200

```
In [5]: 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
```

```
In [6]: data.isna()
```

```
Out[6]:
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	False	False	False	False	False	False	False	False	False	False	True	False
1	False	False	False	False	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False	False	False	True	False
3	False	False	False	False	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False	False	False	True	False
...
886	False	False	False	False	False	False	False	False	False	False	True	False
887	False	False	False	False	False	False	False	False	False	False	False	False
888	False	False	False	False	False	True	False	False	False	False	True	False
889	False	False	False	False	False	False	False	False	False	False	False	False
890	False	False	False	False	False	False	False	False	False	False	True	False

891 rows × 12 columns

```
In [7]: data.Pclass.unique()
```

```
Out[7]: array([3, 1, 2])
```

```
In [8]: data.Survived.unique()
```

```
Out[8]: array([0, 1])
```

```
In [9]: data.SibSp.unique()
```

```
Out[9]: array([1, 0, 3, 4, 2, 5, 8])
```

```
In [10]: data.Parch.unique()
```

```
Out[10]: array([0, 1, 2, 5, 3, 4, 6])
```

```
In [11]: data.Age.unique()
```

```
Out[11]: array([22. , 38. , 26. , 35. , nan, 54. , 2. , 27. , 14. ,  
 4. , 58. , 20. , 39. , 55. , 31. , 34. , 15. , 28. ,  
 8. , 19. , 40. , 66. , 42. , 21. , 18. , 3. , 7. ,  
49. , 29. , 65. , 28.5 , 5. , 11. , 45. , 17. , 32. ,  
16. , 25. , 0.83, 30. , 33. , 23. , 24. , 46. , 59. ,  
71. , 37. , 47. , 14.5 , 70.5 , 32.5 , 12. , 9. , 36.5 ,  
51. , 55.5 , 40.5 , 44. , 1. , 61. , 56. , 50. , 36. ,  
45.5 , 20.5 , 62. , 41. , 52. , 63. , 23.5 , 0.92, 43. ,  
60. , 10. , 64. , 13. , 48. , 0.75, 53. , 57. , 80. ,  
70. , 24.5 , 6. , 0.67, 30.5 , 0.42, 34.5 , 74. ])
```

```
In [12]: data1=data.drop(['PassengerId','Cabin','Name','Ticket','SibSp','Parch'],axis=1)
data1
```

Out[12]:

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

891 rows × 6 columns

```
In [13]: data1.shape
```

Out[13]: (891, 6)

```
In [14]: data1['Sex']=data1['Sex'].map({'male':1,'female':0})
```

```
In [15]: data2=data1.fillna(data1.median())
```

In [16]: data2.isna().sum()

```
Out[16]: Survived      0
Pclass      0
Sex         0
Age         0
Fare        0
Embarked    2
dtype: int64
```

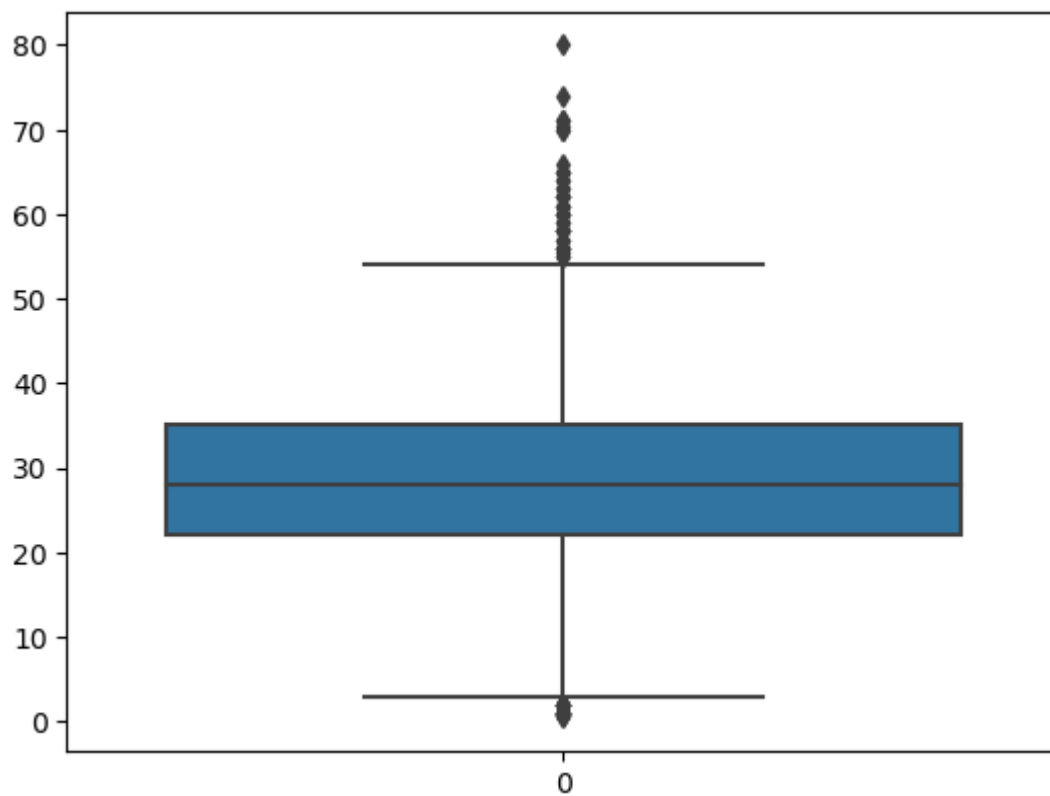
In [17]: data.head()

Out[17]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C85	C
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	S
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	NaN	S

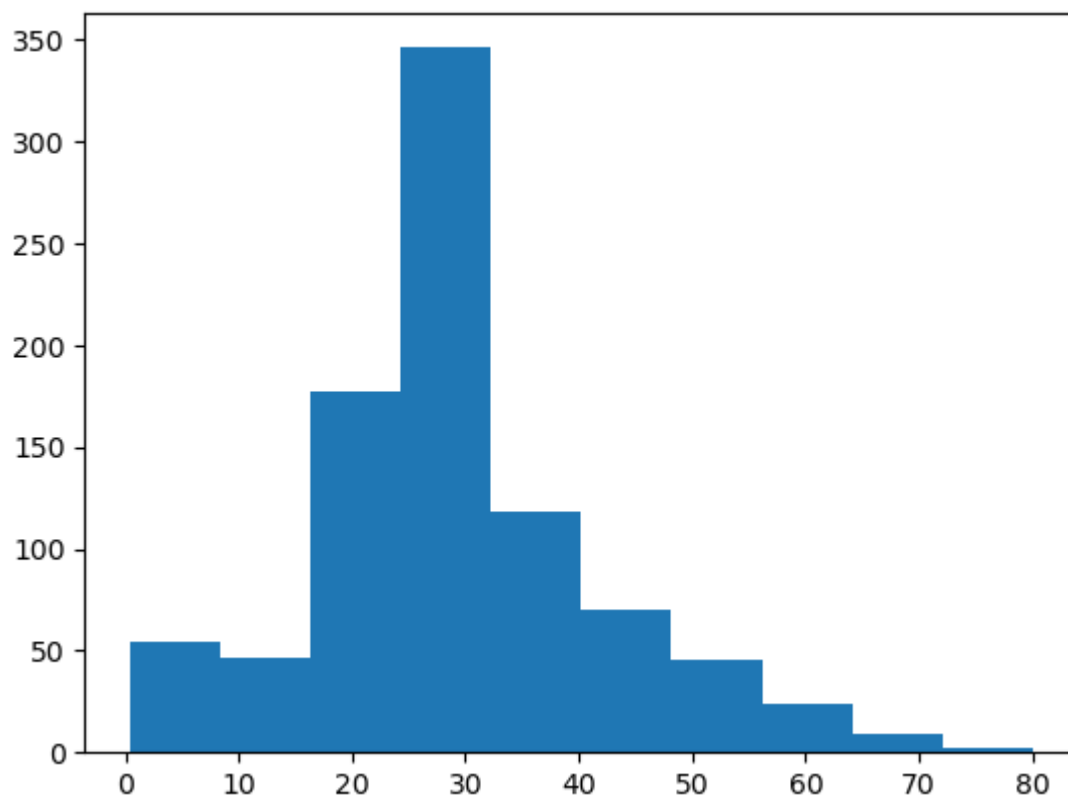
```
In [18]: import seaborn as sns  
import matplotlib.pyplot as plt  
sns.boxplot(data2.Age)
```

Out[18]: <Axes: >



```
In [19]: plt.hist(data2['Age'])
```

```
Out[19]: (array([ 54.,  46., 177., 346., 118.,  70.,  45.,  24.,   9.,   2.]),  
          array([ 0.42 ,  8.378, 16.336, 24.294, 32.252, 40.21 , 48.168, 56.126,  
                64.084, 72.042, 80.   ]),  
          <BarContainer object of 10 artists>)
```




```
In [20]: data2.describe()
```

```
Out[20]:
```

	Survived	Pclass	Sex	Age	Fare
count	891.000000	891.000000	891.000000	891.000000	891.000000
mean	0.383838	2.308642	0.647587	29.361582	32.204208
std	0.486592	0.836071	0.477990	13.019697	49.693429
min	0.000000	1.000000	0.000000	0.420000	0.000000
25%	0.000000	2.000000	0.000000	22.000000	7.910400
50%	0.000000	3.000000	1.000000	28.000000	14.454200
75%	1.000000	3.000000	1.000000	35.000000	31.000000
max	1.000000	3.000000	1.000000	80.000000	512.329200

```
In [21]: data2['Age'].unique()
```

```
Out[21]: array([22. , 38. , 26. , 35. , 28. , 54. , 2. , 27. , 14. ,  
         4. , 58. , 20. , 39. , 55. , 31. , 34. , 15. , 8. ,  
        19. , 40. , 66. , 42. , 21. , 18. , 3. , 7. , 49. ,  
        29. , 65. , 28.5 , 5. , 11. , 45. , 17. , 32. , 16. ,  
        25. , 0.83, 30. , 33. , 23. , 24. , 46. , 59. , 71. ,  
        37. , 47. , 14.5 , 70.5 , 32.5 , 12. , 9. , 36.5 , 51. ,  
        55.5 , 40.5 , 44. , 1. , 61. , 56. , 50. , 36. , 45.5 ,  
        20.5 , 62. , 41. , 52. , 63. , 23.5 , 0.92, 43. , 60. ,  
        10. , 64. , 13. , 48. , 0.75, 53. , 57. , 80. , 70. ,  
        24.5 , 6. , 0.67, 30.5 , 0.42, 34.5 , 74. ])
```

```
In [22]: data.groupby(['Age']).count()
```

Out[22]:

	PassengerId	Survived	Pclass	Name	Sex	SibSp	Parch	Ticket	Fare	Cabin	Embarked
Age											
0.42	1	1	1	1	1	1	1	1	1	0	1
0.67	1	1	1	1	1	1	1	1	1	0	1
0.75	2	2	2	2	2	2	2	2	2	0	2
0.83	2	2	2	2	2	2	2	2	2	0	2
0.92	1	1	1	1	1	1	1	1	1	1	1
...
70.00	2	2	2	2	2	2	2	2	2	1	2
70.50	1	1	1	1	1	1	1	1	1	0	1
71.00	2	2	2	2	2	2	2	2	2	1	2
74.00	1	1	1	1	1	1	1	1	1	0	1
80.00	1	1	1	1	1	1	1	1	1	1	1

88 rows × 11 columns

```
In [23]: data2['Pclass']=data2['Pclass'].map({1:'F',2:'S',3:'Third'})
data2.head(10)
```

Out[23]:

	Survived	Pclass	Sex	Age	Fare	Embarked
0	0	Third	1	22.0	7.2500	S
1	1	F	0	38.0	71.2833	C
2	1	Third	0	26.0	7.9250	S
3	1	F	0	35.0	53.1000	S
4	0	Third	1	35.0	8.0500	S
5	0	Third	1	28.0	8.4583	Q
6	0	F	1	54.0	51.8625	S
7	0	Third	1	2.0	21.0750	S
8	1	Third	0	27.0	11.1333	S
9	1	S	0	14.0	30.0708	C

```
In [24]: data2=pd.get_dummies(data2)
data2.head()
```

Out[24]:

	Survived	Sex	Age	Fare	Pclass_F	Pclass_S	Pclass_Third	Embarked_C	Embarked_Q	Embarked_S
0	0	1	22.0	7.2500	0	0	1	0	0	1
1	1	0	38.0	71.2833	1	0	0	1	0	0
2	1	0	26.0	7.9250	0	0	1	0	0	1
3	1	0	35.0	53.1000	1	0	0	0	0	1
4	0	1	35.0	8.0500	0	0	1	0	0	1

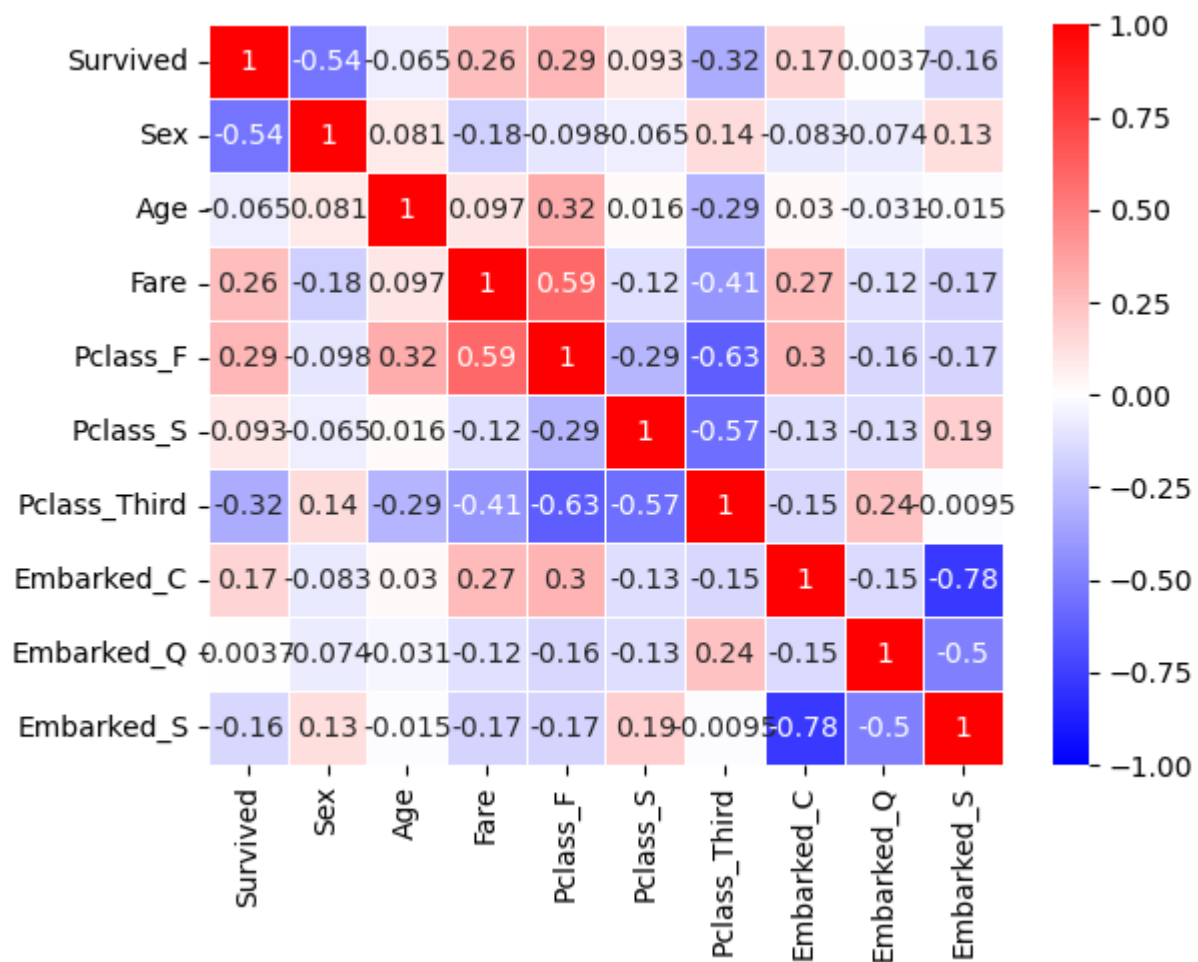
```
In [25]: cor_mat=data2.corr()
cor_mat
```

Out[25]:

	Survived	Sex	Age	Fare	Pclass_F	Pclass_S	Pclass_Third	Embarked_C	Embarked_Q	Embarked_S
Survived	1.000000	-0.543351	-0.064910	0.257307	0.285904	0.093349	-0.322308	0.168240	0.003650	-0.155660
Sex	-0.543351	1.000000	0.081163	-0.182333	-0.098013	-0.064746	0.137143	-0.082853	-0.074115	0.125722
Age	-0.064910	0.081163	1.000000	0.096688	0.323896	0.015831	-0.291955	0.030248	-0.031415	-0.014665
Fare	0.257307	-0.182333	0.096688	1.000000	0.591711	-0.118557	-0.413333	0.269335	-0.117216	-0.166603
Pclass_F	0.285904	-0.098013	0.323896	0.591711	1.000000	-0.288585	-0.626738	0.296423	-0.155342	-0.170379
Pclass_S	0.093349	-0.064746	0.015831	-0.118557	-0.288585	1.000000	-0.565210	-0.125416	-0.127301	0.192061
Pclass_Third	-0.322308	0.137143	-0.291955	-0.413333	-0.626738	-0.565210	1.000000	-0.153329	0.237449	-0.009511
Embarked_C	0.168240	-0.082853	0.030248	0.269335	0.296423	-0.125416	-0.153329	1.000000	-0.148258	-0.778359
Embarked_Q	0.003650	-0.074115	-0.031415	-0.117216	-0.155342	-0.127301	0.237449	-0.148258	1.000000	-0.496624
Embarked_S	-0.155660	0.125722	-0.014665	-0.166603	-0.170379	0.192061	-0.009511	-0.778359	-0.496624	1.000000

```
In [26]: import seaborn as sns
sns.heatmap(cor_mat,vmax=1,vmin=-1,annot=True,linewidths=.5,cmap='bwr')
```

Out[26]: <Axes: >



```
In [27]: data2.groupby('Survived').count()
```

Out[27]:

	Sex	Age	Fare	Pclass_F	Pclass_S	Pclass_Third	Embarked_C	Embarked_Q	Embarked_S
Survived									
0	549	549	549	549	549	549	549	549	549
1	342	342	342	342	342	342	342	342	342

```
In [28]: y=data1['Survived']
X=data2.drop('Survived',axis=1)
```

```
In [29]: from sklearn.model_selection import train_test_split
X_train,X_test,y_train,y_test=train_test_split(X,y,test_size=0.33,random_state=42)
```

```
In [30]: from sklearn.linear_model import LogisticRegression
classifier=LogisticRegression()
classifier.fit(X_train,y_train)
```

Out[30]:

```
▼ LogisticRegression
LogisticRegression()
```

```
In [31]: y_pred=classifier.predict(X_test)
```

In [32]: `y_pred`

Out[32]: `array([0, 0, 0, 1, 1, 1, 1, 0, 1, 1, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0,
 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0,
 1, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 1, 0, 1, 1, 1, 0, 1, 1, 0, 0, 1,
 0, 0, 0, 1, 1, 1, 1, 1, 0, 0, 1, 1, 1, 0, 0, 1, 1, 0, 0, 0, 1, 1,
 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0,
 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 1, 1, 0, 0, 0, 1, 1, 1, 0, 1, 0,
 0, 1, 0, 1, 1, 0, 0, 1, 0, 1, 0, 0, 1, 1, 0, 0, 1, 0, 0, 0, 0, 1,
 0, 0, 0, 1, 1, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 1, 1, 0, 1, 0, 0,
 0, 1, 1, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 1, 1, 0,
 1, 1, 0, 0, 1, 0, 0, 1, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 1, 0, 1, 0,
 0, 1, 0, 0, 0, 1, 0, 1, 1, 0, 0, 1, 0, 1, 0, 1, 1, 1, 0, 0, 1,
 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 1, 0, 1, 0,
 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0,
 1, 0, 0, 0, 0, 0, 1, 1, 0])`

In [33]: `from sklearn.metrics import confusion_matrix
confusion_matrix(y_test,y_pred)`

Out[33]: `array([[154, 21],
 [37, 83]])`

In [34]: `from sklearn.metrics import accuracy_score
accuracy_score(y_test,y_pred)`

Out[34]: `0.8033898305084746`

In [35]:

y

Out[35]:

```
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
```

In [36]:

154+83

Out[36]:

237

In [37]:

237/(237+21+37)

Out[37]:

0.8033898305084746

In []: