Task1(" TITANIC SURVIVAL PREDICTION")

In [96]:
```
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.preprocessing import LabelEncoder
from sklearn.impute import SimpleImputer
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import accuracy_score, confusion_matrix, classification_rep
```

In [97]:
```
sns.set(style='white')
```

In [98]:
```
df = pd.read_csv(r"C:\Users\gonda\Titanic-Dataset.csv")
```

In [101…
```
df.head()
```

Out[101…

	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	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

In [102…
```
df.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 [103…

```
df.describe()
```

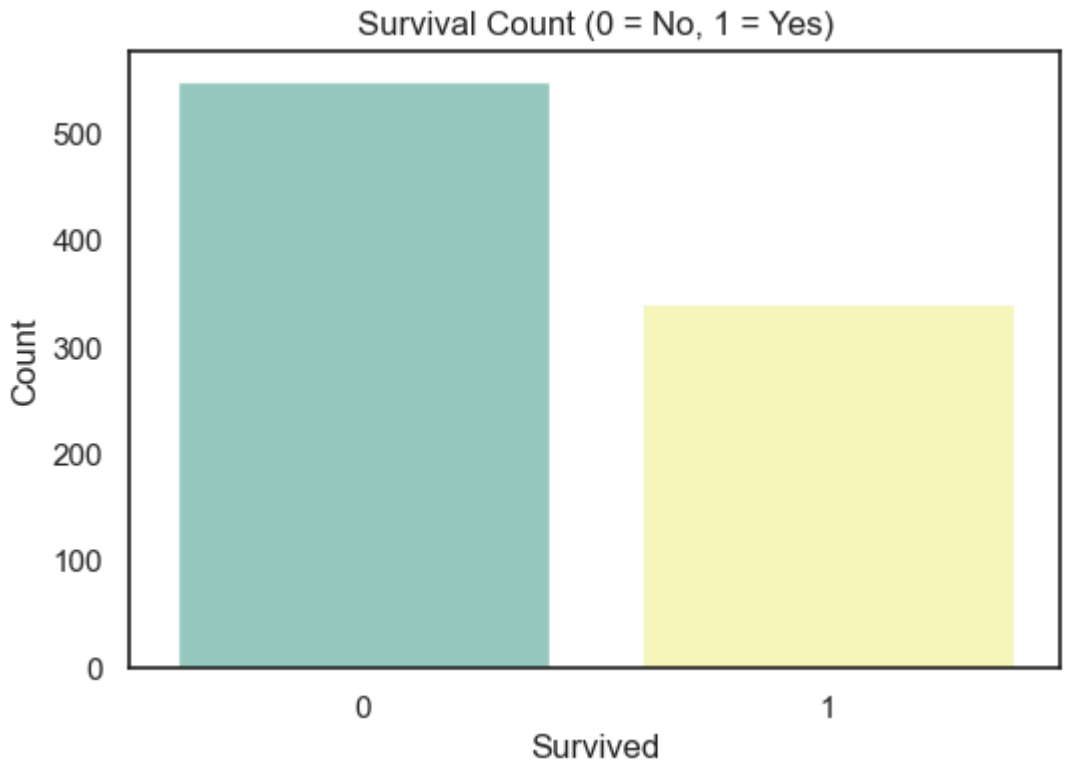
Out[103…

	PassengerId	Survived	Pclass	Age	SibSp	Parch	
count	891.000000	891.000000	891.000000	714.000000	891.000000	891.000000	891.000
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	0.000
25%	223.500000	0.000000	2.000000	20.125000	0.000000	0.000000	7.910
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	31.000
max	891.000000	1.000000	3.000000	80.000000	8.000000	6.000000	512.329

In [106…

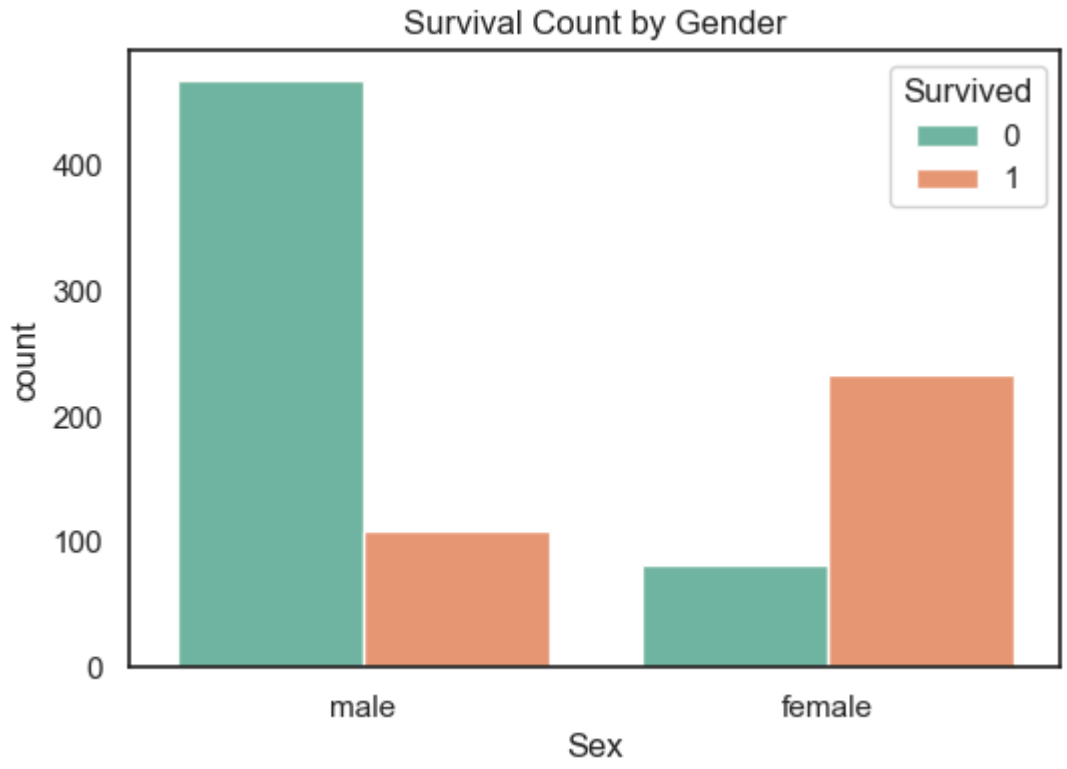
```
plt.figure(figsize=(6,4))
sns.countplot(x='Survived', data=df, palette='Set3')
plt.title('Survival Count (0 = No, 1 = Yes)')
plt.xlabel('Survived')
plt.ylabel('Count')
plt.show()
```

```
C:\Users\gonda\AppData\Local\Temp\ipykernel_15760\1414992181.py:2: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v
0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effe
ct.

  sns.countplot(x='Survived', data=df, palette='Set3')
```

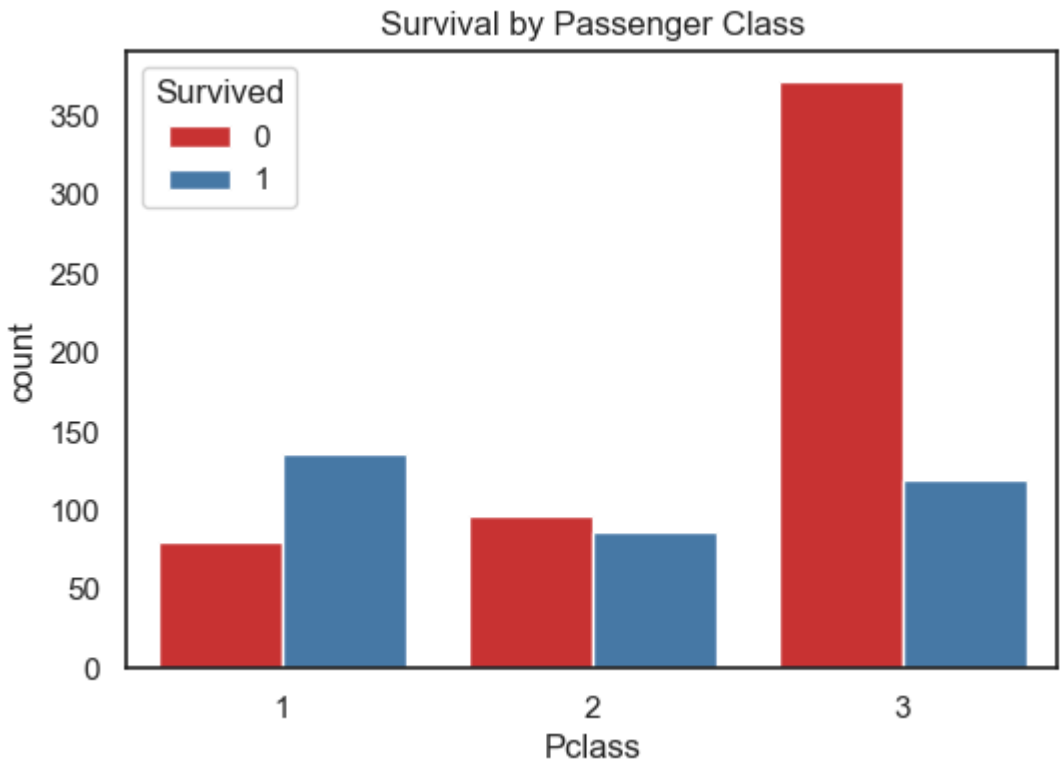


In [ ]:

In [107…
```
plt.figure(figsize=(6, 4))
sns.countplot(x='Sex', hue='Survived', data=df, palette='Set2')
plt.title('Survival Count by Gender')
plt.show()
```



In [110…
```
plt.figure(figsize=(6, 4))
sns.countplot(x='Pclass', hue='Survived', data=df, palette='Set1')
plt.title('Survival by Passenger Class')
plt.show()
```



In [113…]
```
plt.figure(figsize=(8, 5))
sns.histplot(df['Age'].dropna(), bins=30, kde=True, color='red')
plt.title('Age Distribution of Passengers')
plt.xlabel('Age')
plt.ylabel('Frequency')
plt.show()
```

In [67]:
```
df.drop(['PassengerId', 'Name', 'Ticket', 'Cabin'], axis=1, inplace=True)
```

In [68]:
```
imputer = SimpleImputer(strategy='most_frequent')
```

```
df[['Age', 'Embarked']] = imputer.fit_transform(df[['Age', 'Embarked']])
```

In [69]:
```
le_sex = LabelEncoder()
le_embarked = LabelEncoder()
df['Sex'] = le_sex.fit_transform(df['Sex'])
df['Embarked'] = le_embarked.fit_transform(df['Embarked'])
```

In [70]:
```
X = df.drop("Survived", axis=1)
y = df["Survived"]
```

In [71]:
```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_
```

In [72]:
```
model = LogisticRegression(max_iter=200)
model.fit(X_train, y_train)
```

Out[72]:

▾ LogisticRegression

LogisticRegression(max_iter=200)

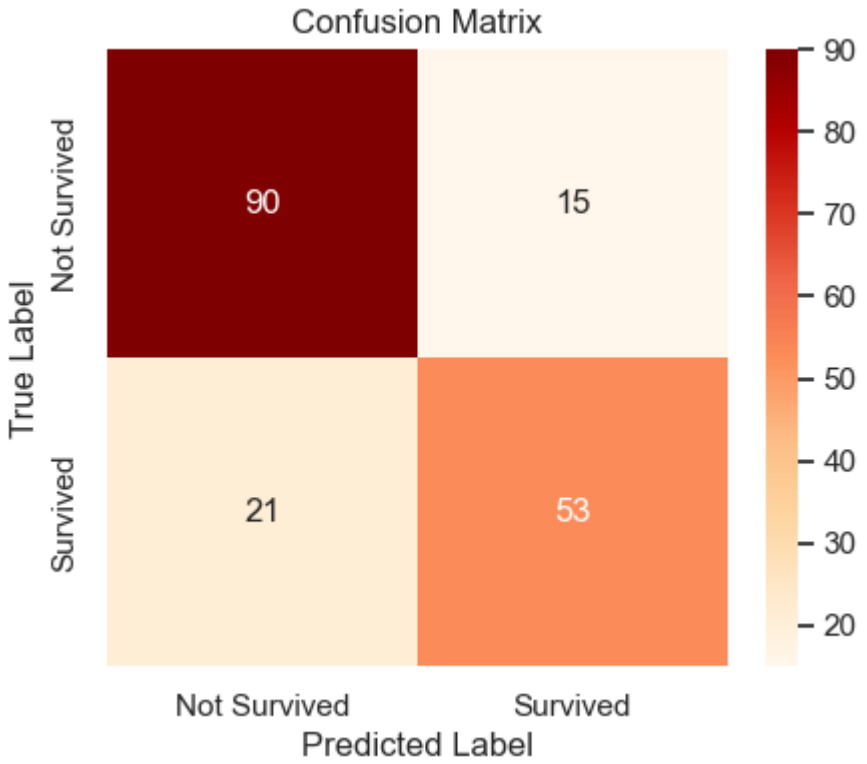
In [73]:
```
y_pred = model.predict(X_test)
```

In [74]:
```
print("Accuracy:", accuracy_score(y_test, y_pred))
print("Confusion Matrix:\n", confusion_matrix(y_test, y_pred))
print("Classification Report:\n", classification_report(y_test, y_pred))
```

```
Accuracy: 0.7988826815642458
Confusion Matrix:
 [[90 15]
 [21 53]]
Classification Report:
              precision    recall  f1-score   support

           0       0.81      0.86      0.83       105
           1       0.78      0.72      0.75        74

    accuracy                           0.80       179
   macro avg       0.80      0.79      0.79       179
weighted avg       0.80      0.80      0.80       179
```

In [ ]:
```
```

In [120…
```
plt.figure(figsize=(5, 4))
sns.heatmap(confusion_matrix(y_test, y_pred), annot=True, fmt="d", cmap="OrRd",
xticklabels=["Not Survived", "Survived"], yticklabels=["Not Survived", "Survived
plt.title("Confusion Matrix")
plt.ylabel("True Label")
plt.xlabel("Predicted Label")
plt.show()
```


Confusion Matrix
90
15
21
53
Not Survived
Survived
True Label
Not Survived
Survived
Predicted Label
90
80
70
60
50
40
30
20

In [ ]:

In [ ]:

In [ ]: