Load and Extract zip File

In [7]:
```
# Step 1: Mount Google Drive
from google.colab import drive
drive.mount('/content/drive')

# Step 2: Extract the zip file
import zipfile
import os

# Path to the zip file
zip_path = '/content/drive/MyDrive/archive (13).zip'

# Directory to extract to
extract_dir = '/content/drive/My Drive/data/extracted/'

# Create the directory if it doesn't exist
os.makedirs(extract_dir, exist_ok=True)

# Extract the zip file
with zipfile.ZipFile(zip_path, 'r') as zip_ref:
    zip_ref.extractall(extract_dir)

print(f"Files extracted to {extract_dir}")
```

```
Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.moun
t("/content/drive", force_remount=True).
Files extracted to /content/drive/My Drive/data/extracted/
```

Import Libraries

In [8]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.express as px
from plotly.offline import iplot
from plotly.subplots import make_subplots
from sklearn import tree
from sklearn.ensemble import RandomForestClassifier
from sklearn.linear_model import LogisticRegression
from sklearn.preprocessing import LabelEncoder
from sklearn.model_selection import train_test_split

import warnings
warnings.filterwarnings('ignore')
```

Loading Data

In [9]:
```
df = pd.read_csv('/content/drive/MyDrive/data/extracted/Titanic-Dataset.csv')
```

Exploring the Data

In [10]:
```
df.head()
```

Out[10]:

	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 [12]:
```
df.shape
```

Out[12]:
```
(891, 12)
```

In [13]:
```
df.duplicated().sum()
```

Out[13]:
```
0
```

In [14]:
```
df.isnull().sum()
```

Out[14]:
```
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
```

In [15]:
```
df.groupby('Sex')['Age'].mean().reset_index()
```

Out[15]:

	Sex	Age
0	female	27.915709
1	male	30.726645

In [17]:
```
df['Age'].fillna(df['Age'].mean(), inplace=True)
```

In [18]:
```
df.drop('Cabin', axis=1,inplace=True)
```

In [19]:
```
df.dropna(inplace=True)
```

In [53]:
```
df.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: 83.3+ KB
```

Analysis & Visualization

In [20]:
```
df.head()
```

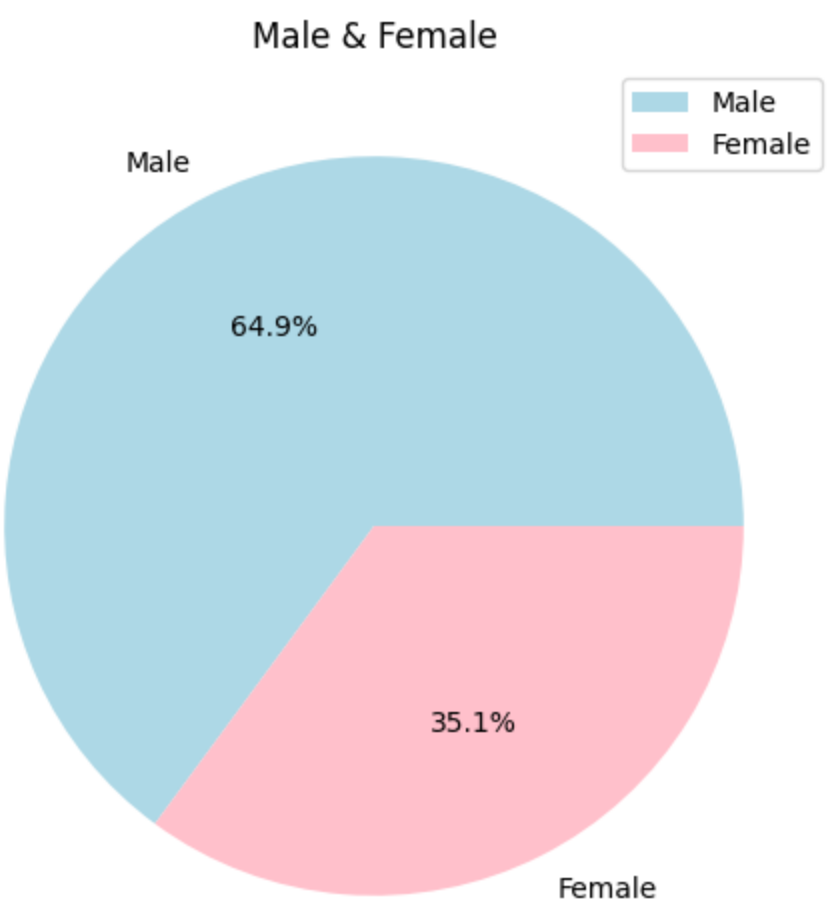
Out[20]:

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

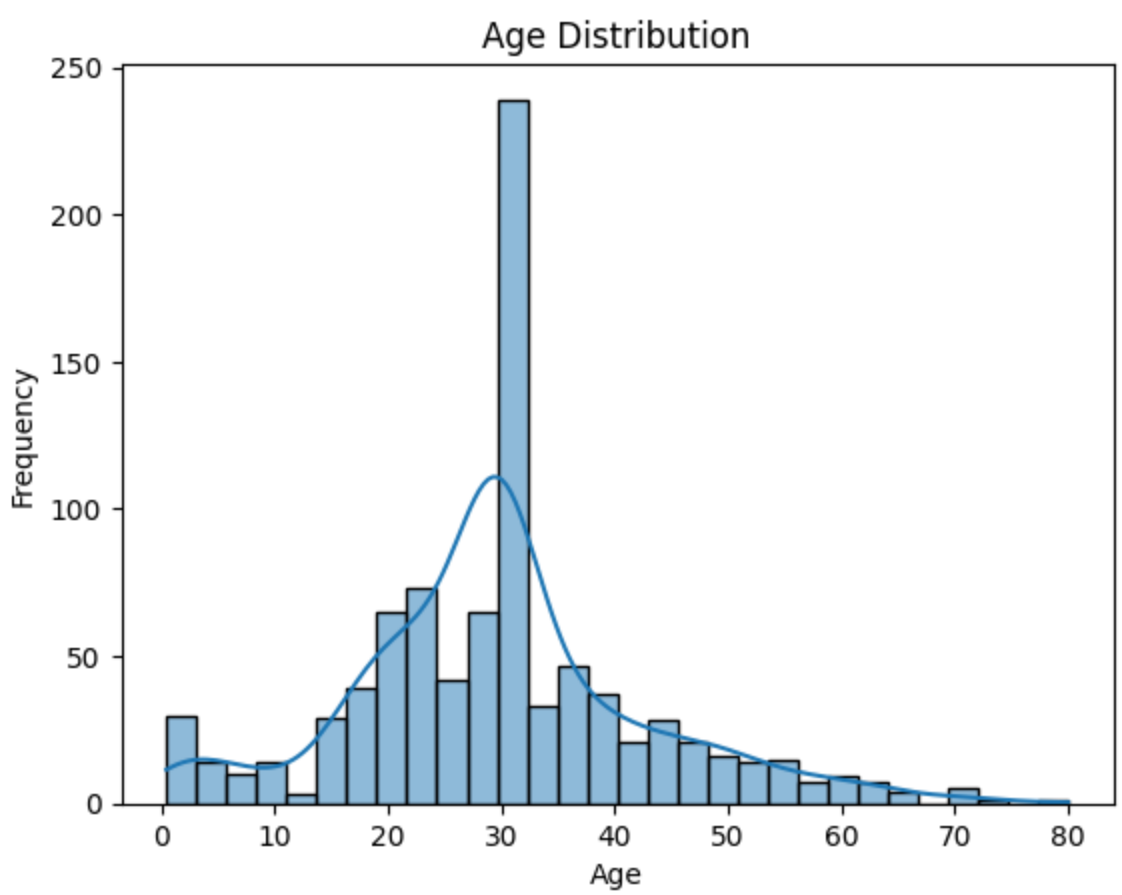
In [21]:
```
gender = df['Sex'].value_counts()
gender
```

Out[21]:
```
Sex
male      577
female    312
Name: count, dtype: int64
```

In [22]:
```
plt.figure(figsize=(10,6))
plt.pie(gender, labels=['Male', 'Female'] ,autopct='%.1f%%', colors=['lightblue','pink'])
plt.legend()
plt.title('Male & Female')
plt.show()
```



In [23]:
```
sns.histplot(data=df, x='Age', bins=30, kde=True)
plt.title('Age Distribution')
plt.xlabel('Age')
plt.ylabel('Frequency')
plt.show()
```

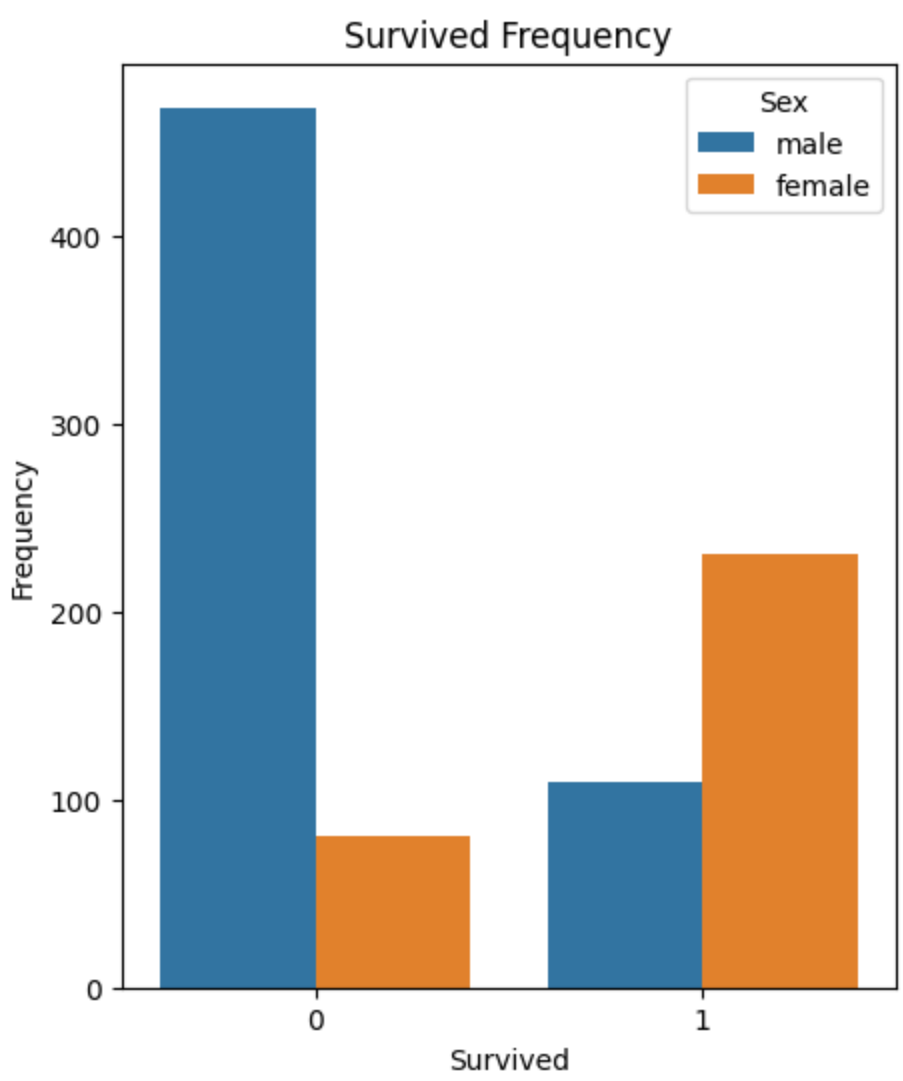


In [24]:
```
sv_sex = df[['Survived','Sex']].value_counts().reset_index()
sv_sex
```

Out[24]:

	Survived	Sex	count
0	0	male	468
1	1	female	231
2	1	male	109
3	0	female	81

In [25]:
```
plt.figure(figsize=(5,6))
sns.barplot(data=sv_sex , x=sv_sex['Survived'], y=sv_sex['count'], hue=sv_sex['Sex'])
plt.title('Survived Frequency')
plt.xlabel('Survived')
plt.ylabel('Frequency')
plt.show()
```

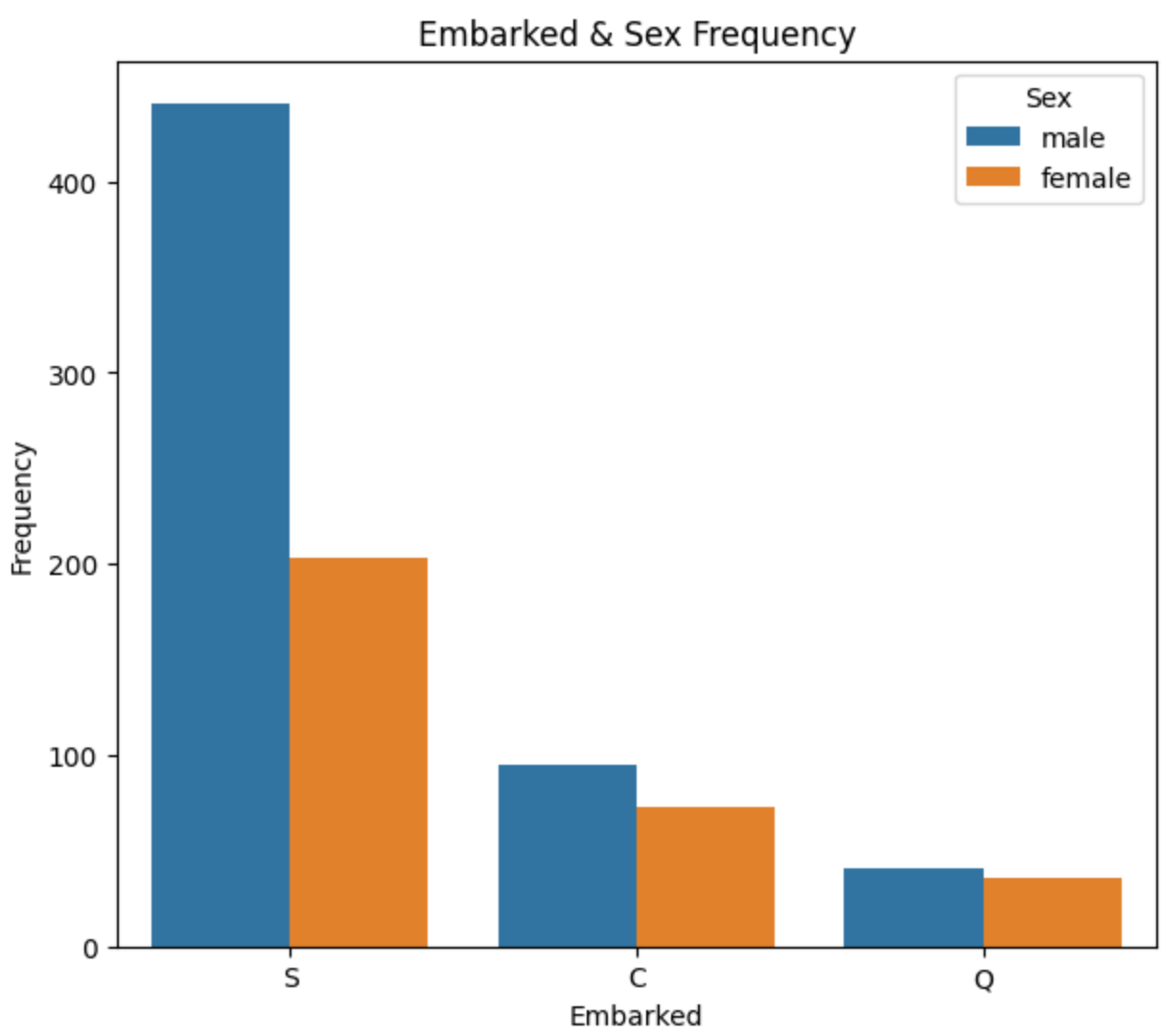


In [26]:
```
Em_sex = df[['Embarked', 'Sex']].value_counts().reset_index()
Em_sex
```

Out[26]:

	Embarked	Sex	count
0	S	male	441
1	S	female	203
2	C	male	95
3	C	female	73
4	Q	male	41
5	Q	female	36

In [27]:
```
plt.figure(figsize=(7,6))
sns.barplot(data=Em_sex , x=Em_sex['Embarked'], y=Em_sex['count'], hue=Em_sex['Sex'])
plt.title('Embarked & Sex Frequency')
plt.xlabel('Embarked')
plt.ylabel('Frequency')
plt.show()
```

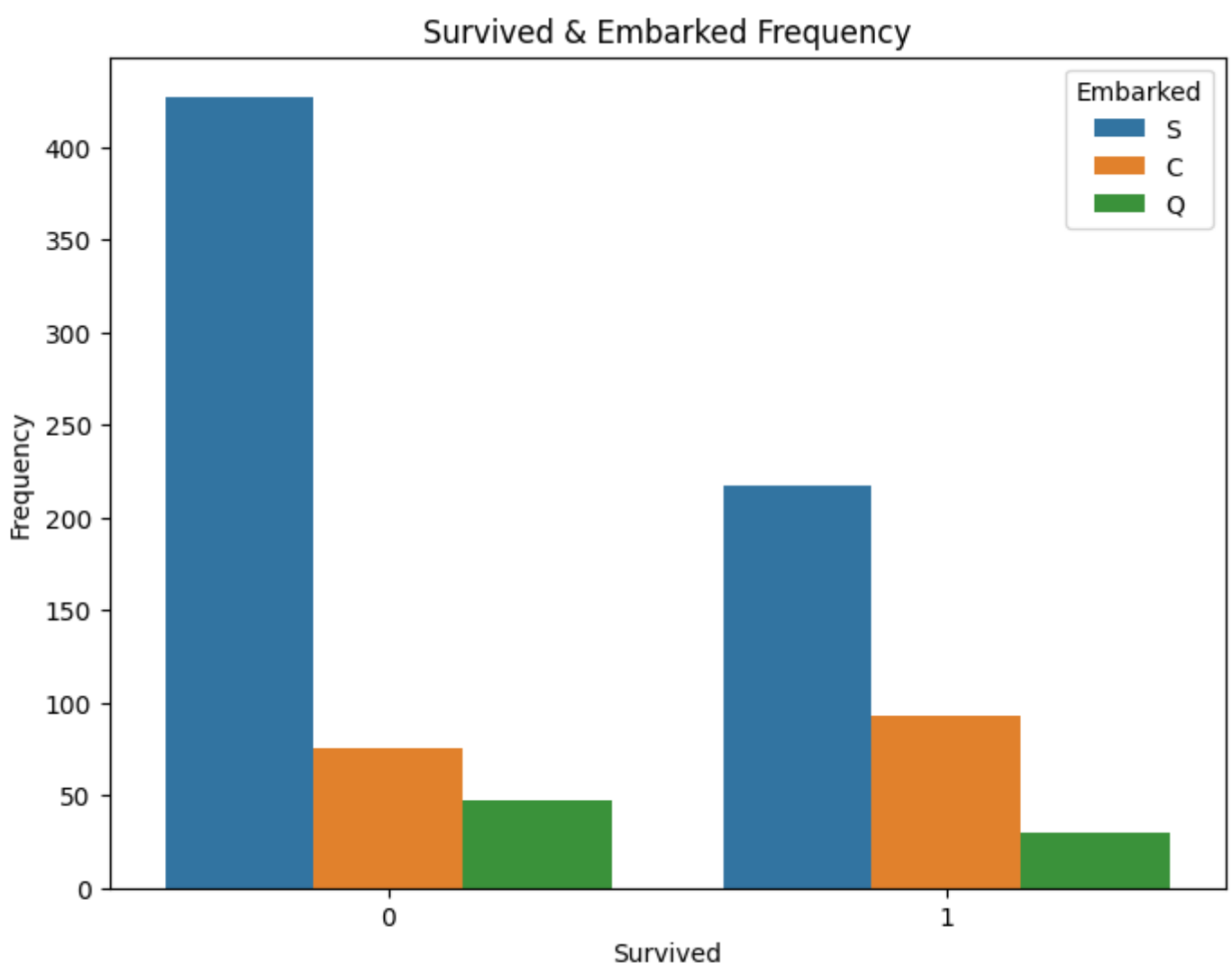


In [28]:
```
sv_em = df[['Survived', 'Embarked']].value_counts().reset_index()
sv_em
```

Out[28]:

	Survived	Embarked	count
0	0	S	427
1	1	S	217
2	1	C	93
3	0	C	75
4	0	Q	47
5	1	Q	30

In [29]:
```
plt.figure(figsize=(8,6))
sns.barplot(data=sv_em , x=sv_em['Survived'], y=sv_em['count'], hue=sv_em['Embarked'])
plt.title('Survived & Embarked Frequency')
plt.xlabel('Survived')
plt.ylabel('Frequency')
plt.show()
```

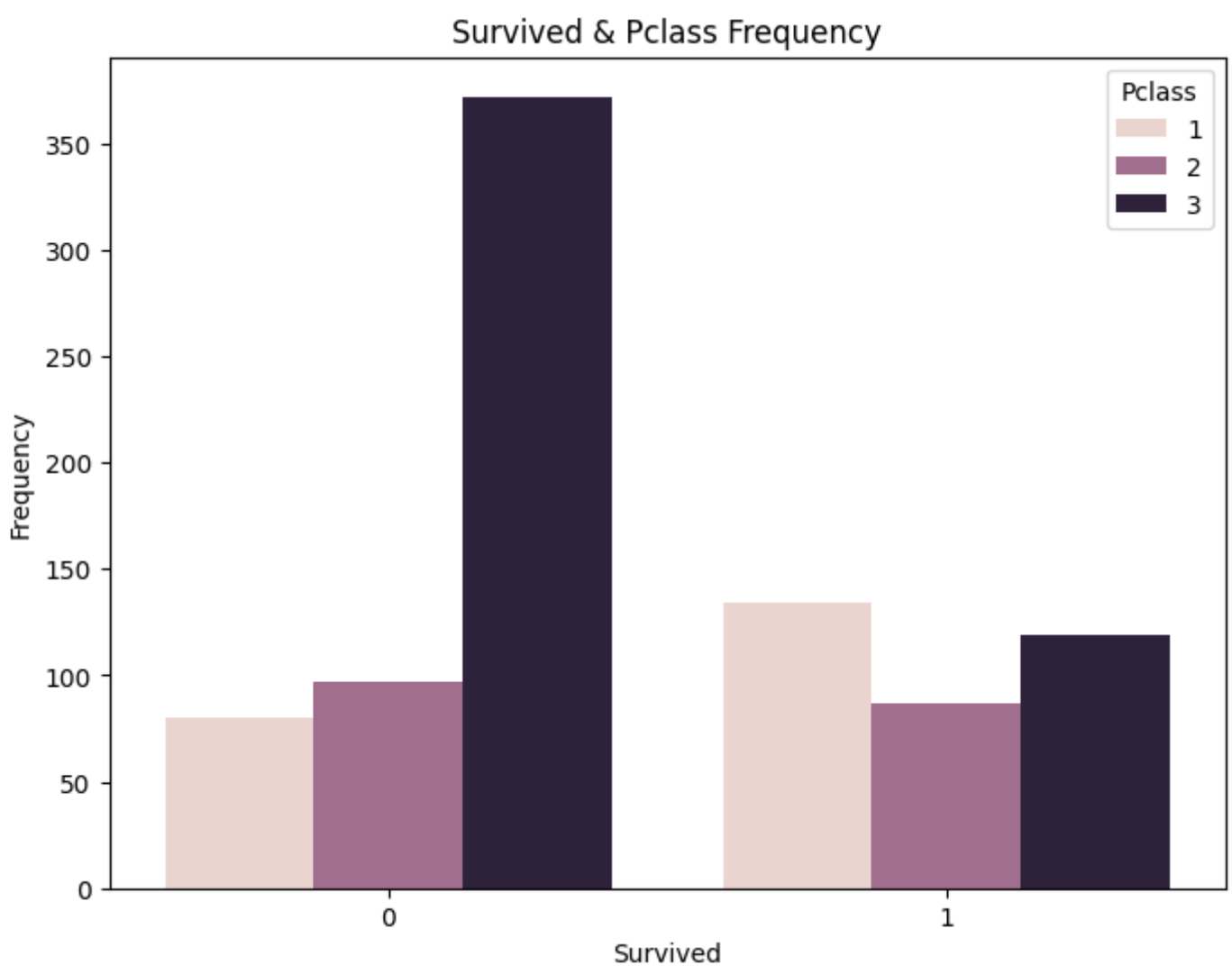


In [30]:
```
sv_class = df[['Survived', 'Pclass']].value_counts().reset_index()
sv_class
```

Out[30]:

	Survived	Pclass	count
0	0	3	372
1	1	1	134
2	1	3	119
3	0	2	97
4	1	2	87
5	0	1	80

In [31]:
```
plt.figure(figsize=(8,6))
sns.barplot(data=sv_class , x=sv_class['Survived'], y=sv_class['count'], hue=sv_class['P
plt.title('Survived & Pclass Frequency')
plt.xlabel('Survived')
plt.ylabel('Frequency')
plt.show()
```

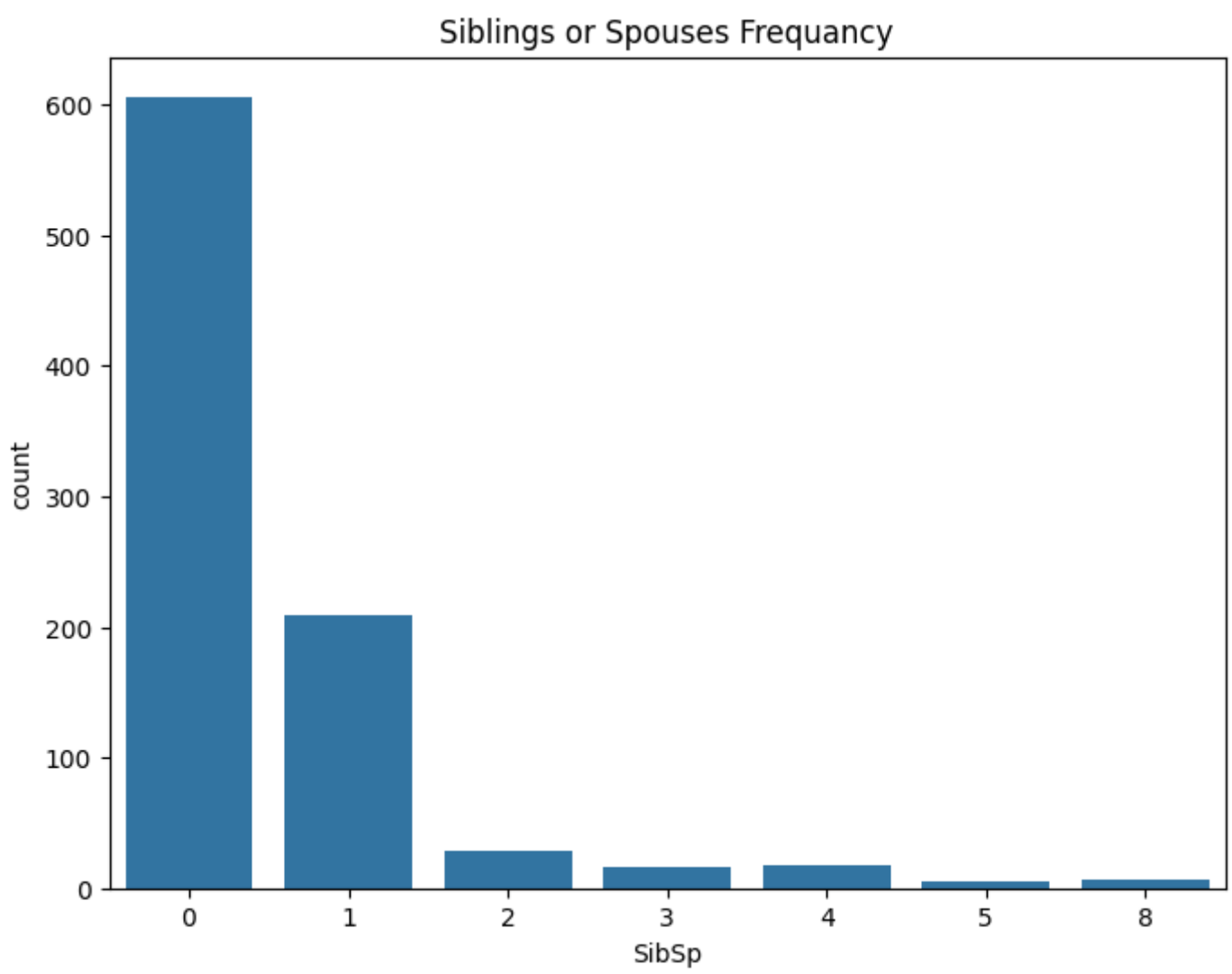


In [32]:
```
sibling = df['SibSp'].value_counts().reset_index()
sibling
```

Out[32]:

	SibSp	count
0	0	606
1	1	209
2	2	28
3	4	18
4	3	16
5	8	7
6	5	5

In [33]:
```
plt.figure(figsize=(8,6))
sns.barplot(x=sibling['SibSp'], y=sibling['count'])
plt.title('Siblings or Spouses Frequancy')
plt.show()
```



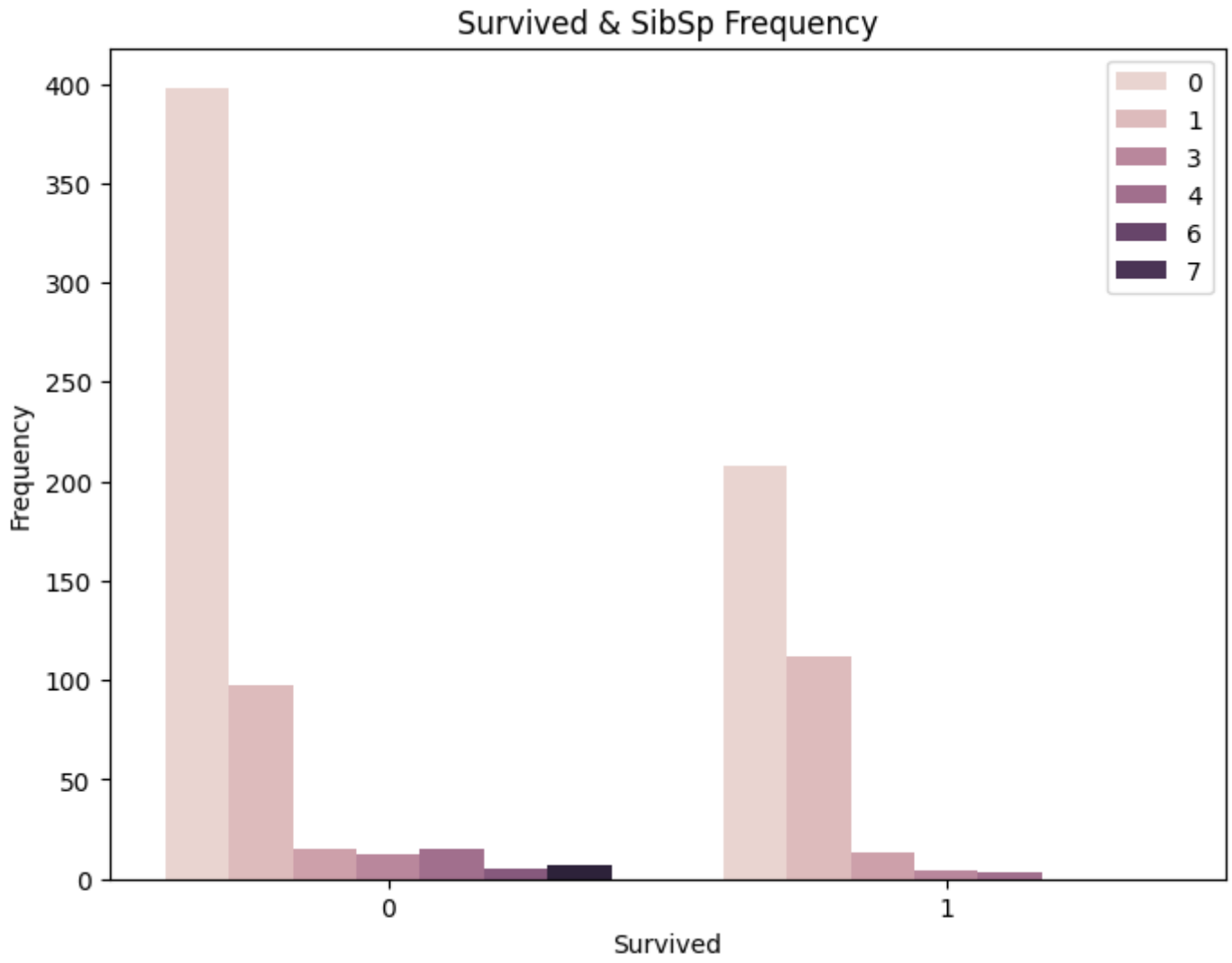
In [34]:
```
sv_sibling = df[['Survived', 'SibSp']].value_counts().reset_index()
sv_sibling
```

Out[34]:

	Survived	SibSp	count
0	0	0	398
1	1	0	208
2	1	1	112
3	0	1	97
4	0	2	15
5	0	4	15
6	1	2	13
7	0	3	12
8	0	8	7
9	0	5	5
10	1	3	4
11	1	4	3

In [35]:
```
plt.figure(figsize=(8,6))
sns.barplot(data=sv_sibling , x=sv_sibling['Survived'], y=sv_sibling['count'], hue=sv_si
```

```
plt.title('Survived & SibSp Frequency')
plt.legend(loc='upper right')
plt.xlabel('Survived')
plt.ylabel('Frequency')
plt.show()
```



Build The Model

In [36]:
```
test = df.drop(['PassengerId','Name','Ticket'], axis=1)
test
```

Out[36]:

	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 × 8 columns

In [37]:
```
label_encoder = LabelEncoder()
```

In [38]:
```
test['Sex'] = label_encoder.fit_transform(test['Sex'])
test['Embarked'] = label_encoder.fit_transform(test['Embarked'])
```

In [39]:
```
test
```

Out[39]:

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

889 rows × 8 columns

In [40]:
```
x= test.drop('Survived', axis=1)
y = test['Survived']
```

In [41]:
```
X_train, x_test, Y_train, y_test = train_test_split(x,y,test_size=0.2,random_state=11)
```

Logistic Regression

In [43]:
```
model_logistic = LogisticRegression()
```

In [45]:
```
model_logistic.fit(X_train,Y_train)
```

Out[45]:
```
▾ LogisticRegression
LogisticRegression()
```

In [46]:
```
model_logistic.score(X_train,Y_train)
```

Out[46]:
```
0.7946554149085795
```

In [47]:
```
model_logistic.score(x_test,y_test)
```

Out[47]:
```
0.8426966292134831
```

Random Forest

In [49]:
```
model_random = RandomForestClassifier()
```

In [50]:
```
model_random.fit(X_train,Y_train)
```

Out[50]:
```
▾ RandomForestClassifier
RandomForestClassifier()
```

In [51]:
```
model_random.score(X_train,Y_train)
```

Out[51]:
```
0.9831223628691983
```

In [52]:
```
model_random.score(x_test,y_test)
```

Out[52]:
```
0.8033707865168539
```