In [1]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import accuracy_score
```

In [2]:
```
import warnings
warnings.filterwarnings("ignore")
```

In [3]:
```
titanic_data = pd.read_csv('../input/titanic/train.csv')
titanic_test = pd.read_csv('../input/titanic/test.csv')
titanic_data.head()
```

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

In [4]:
```
titanic_data.shape
```

Out[4]:
```
(891, 12)
```

In [5]:
```
titanic_data.describe()
```

Out[5]:

	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 [6]:
```
titanic_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 [7]:
```
titanic_data.isnull().sum()
```

Out[7]:
```
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 [8]:
```
titanic_data = titanic_data.drop(columns='Cabin', axis = 1)
```

In [9]:
```
titanic_data['Age'].fillna(titanic_data['Age'].mean(), inplace= True)
```

In [10]:
```
print(titanic_data['Embarked'].mode()[0])
```

```
S
```

In [11]:
```
titanic_data['Embarked'].fillna(titanic_data['Embarked'].mode()[0], inplace= True)
```

In [12]:
```
titanic_data.isnull().sum()
```

Out[12]:
```
PassengerId    0
Survived       0
Pclass         0
Name           0
Sex            0
Age            0
SibSp          0
Parch          0
Ticket         0
Fare           0
Embarked       0
dtype: int64
```

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

Out[13]:
```
(891, 11)
```

In [14]:
```
titanic_data.corr()
```

Out[14]:

	PassengerId	Survived	Pclass	Age	SibSp	Parch	Fare
PassengerId	1.000000	-0.005007	-0.035144	0.033207	-0.057527	-0.001652	0.012658
Survived	-0.005007	1.000000	-0.338481	-0.069809	-0.035322	0.081629	0.257307
Pclass	-0.035144	-0.338481	1.000000	-0.331339	0.083081	0.018443	-0.549500
Age	0.033207	-0.069809	-0.331339	1.000000	-0.232625	-0.179191	0.091566
SibSp	-0.057527	-0.035322	0.083081	-0.232625	1.000000	0.414838	0.159651
Parch	-0.001652	0.081629	0.018443	-0.179191	0.414838	1.000000	0.216225
Fare	0.012658	0.257307	-0.549500	0.091566	0.159651	0.216225	1.000000

In [15]:
```
titanic_data['Survived'].value_counts()
```

In [15]:
```
titanic_data['Survived'].value_counts()
```

Out[15]:
```
0    549
1    342
Name: Survived, dtype: int64
```

In [16]:
```
titanic_data['Sex'].value_counts()
```

Out[16]:
```
male      577
female    314
Name: Sex, dtype: int64
```

In [17]:
```
titanic_data.replace({'Sex':{'male':0,'female':1}}, inplace = True)
```

In [18]:
```
titanic_data['Embarked'].unique()
```

Out[18]:
```
array(['S', 'C', 'Q'], dtype=object)
```

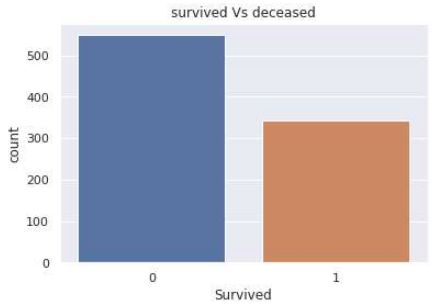
In [19]:
```
titanic_data.replace({'Embarked':{'S':0,'C':1, 'Q':2}}, inplace = True)
```

In [20]:
```
titanic_data['Parch'].unique()
```

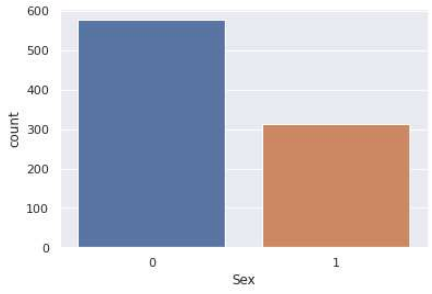
Out[20]:
```
array([0, 1, 2, 5, 3, 4, 6])
```

In [21]:
```
sns.set()
```

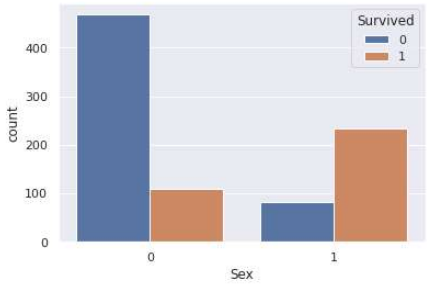
In [22]:
```
sns.countplot(x = titanic_data['Survived']).set_title('survived Vs deceased');
```



In [23]:
```
sns.countplot(x = titanic_data['Sex']);
```



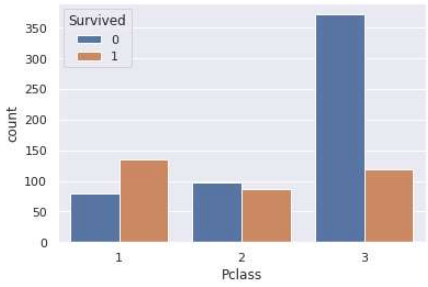
In [24]:
```
sns.countplot('Sex', hue='Survived', data = titanic_data);
```



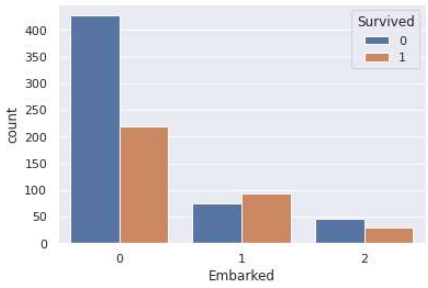
In [25]:
```
titanic_data['Pclass'].value_counts()
```

Out[25]:
```
3    491
1    216
2    184
Name: Pclass, dtype: int64
```

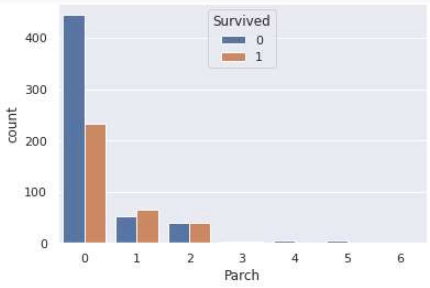
In [26]:
```
sns.countplot('Pclass', hue='Survived', data = titanic_data);
```



In [27]:
```
sns.countplot('Embarked', hue='Survived', data = titanic_data);
```



In [28]:
```
sns.countplot('Parch', hue='Survived', data = titanic_data);
```



In [29]:
```
titanic_data
```

Out[29]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Embarked
0	1	0	3	Braund, Mr. Owen Harris	0	22.000000	1	0	A/5 21171	7.2500	0
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	1	38.000000	1	0	PC 17599	71.2833	1
2	3	1	3	Heikkinen, Miss. Laina	1	26.000000	0	0	STON/O2. 3101282	7.9250	0
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	1	35.000000	1	0	113803	53.1000	0
4	5	0	3	Allen, Mr. William Henry	0	35.000000	0	0	373450	8.0500	0
...	...	...	...	...	...	...	...	...	...	...	...
886	887	0	2	Montvila, Rev. Juozas	0	27.000000	0	0	211536	13.0000	0
887	888	1	1	Graham, Miss. Margaret Edith	1	19.000000	0	0	112053	30.0000	0
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	1	29.699118	1	2	W./C. 6607	23.4500	0
889	890	1	1	Behr, Mr. Karl Howell	0	26.000000	0	0	111369	30.0000	1
890	891	0	3	Dooley, Mr. Patrick	0	32.000000	0	0	370376	7.7500	2

891 rows × 11 columns

```
Age            float64
SibSp            int64
Parch            int64
Ticket          object
Fare           float64
Embarked         int64
dtype: object
```

In [31]:
```
X = titanic_data.drop(columns= ['PassengerId','Name','Ticket','Survived'],axis=1)
Y = titanic_data['Survived']
```

In [32]:
```
print(X,Y)
```

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

[891 rows x 7 columns] 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 [33]: X_train,X_test,Y_train,Y_test = train_test_split(X,Y,test_size= 0.2,random_state=2)
         print(X_train.shape,X_test.shape,Y_train.shape,Y_test.shape)

         (712, 7) (179, 7) (712,) (179,)
```

Model Training:

Logistic Regression

```
In [34]: logreg = LogisticRegression()

In [35]: logreg.fit(X_train,Y_train)

Out[35]: LogisticRegression()
```

OUTPUT

Model Evaluation:

```
In [36]: X_train_pred = logreg.predict(X_train)
         X_train_pred.shape

Out[36]: (712,)

In [37]: ac_training = accuracy_score(Y_train,X_train_pred)
         print('Training Accuracy= ', round(ac_training * 100),'%')

         Training Accuracy=  81 %

In [38]: X_test_pred = logreg.predict(X_test)
         X_test_pred.shape

Out[38]: (179,)

In [39]: ac_testing = accuracy_score(Y_test,X_test_pred)
         print('Testing Accuracy= ', round(ac_testing * 100),'%')

         Testing Accuracy=  78 %
```