Titanic Data Analysis

In [1]:

```
%matplotlib inline
import pandas as pd
import matplotlib.pyplot as plt
from pandas.plotting import scatter_matrix
import seaborn as sns
```

Load the data

In [2]:

```
data = pd.read_csv('train.csv')
```

In [3]:

```
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

Clean the data

In [4]:

```
data.info() # to find out if there is any missing data
```

```
<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 [5]:

```
mean = data['Age'].mean()
```

In [6]:

```
mean
```

Out[6]:

```
29.69911764705882
```

In [7]:

```
data['Age'] = data['Age'].fillna(mean)
```

In [8]:

```
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          891 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 [9]:

```
data = data.drop(['Ticket' , 'Cabin'], axis =1)
```

In [10]:

```
data.head()
```

Out[10]:

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

In [11]:

```
mode = data['Embarked'].mode()
```

In [12]:

```
mode
```

Out[12]:

Out[12]:

```
0    S
dtype: object
```

In [13]:

```
data['Embarked'].fillna(mode)
data['Embarked'] = data['Embarked'].fillna('S')
#data['Embarked'].fillna(mode).info
```

In [14]:

```
data.Embarked.isna().any()
```

Out[14]:

```
False
```

In [15]:

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 10 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          891 non-null    float64
 6   SibSp        891 non-null    int64  
 7   Parch        891 non-null    int64  
 8   Fare         891 non-null    float64
 9   Embarked     891 non-null    object 
dtypes: float64(2), int64(5), object(3)
memory usage: 69.7+ KB
```

In [16]:

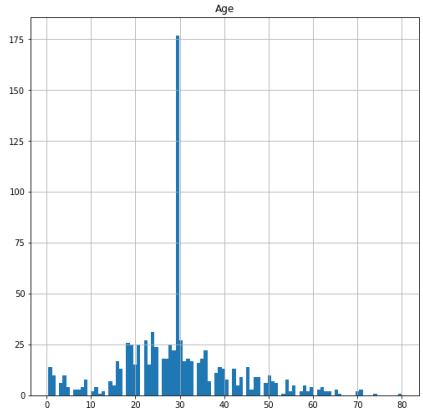
```
data['Embarked'].value_counts()
```

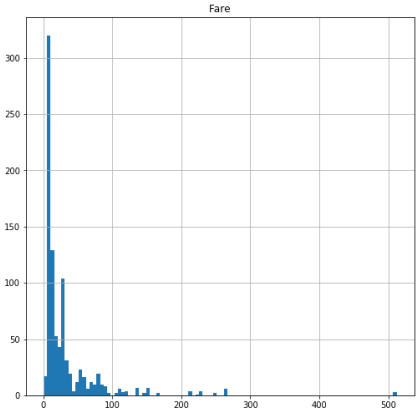
Out[16]:

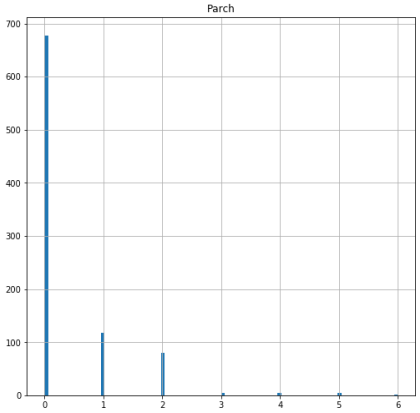
```
S    646
C    168
Q     77
Name: Embarked, dtype: int64
```

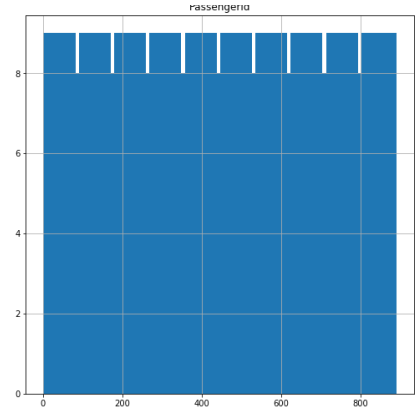
In [17]:

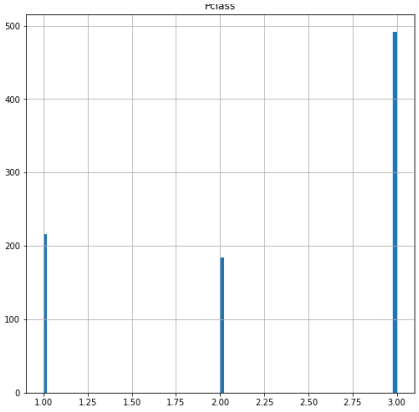
```
data.hist(bins = 100, figsize =(30,30))
plt.show()
```

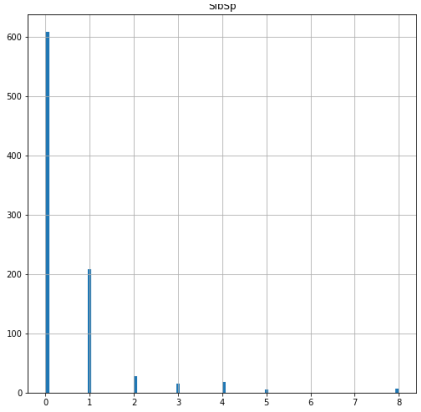


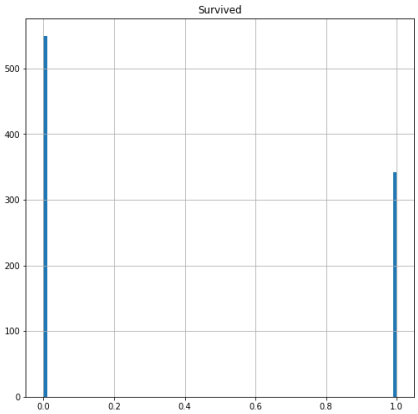












Looking for correlations

In [18]:

```
corr_matrix = data.corr()
```

In [19]:

```
corr_matrix['Survived'].sort_values(ascending = False)
```

Out[19]:

```
Survived       1.000000
Fare           0.257307
Parch          0.081629
PassengerId   -0.005007
SibSp         -0.035322
Age           -0.069809
Pclass        -0.338481
Name: Survived, dtype: float64
```

In [20]:

```
#somewhat depends on age and P class
```

In [21]:

```
attributes = ['Survived', 'Pclass', 'Age', 'Parch', 'Fare']
```

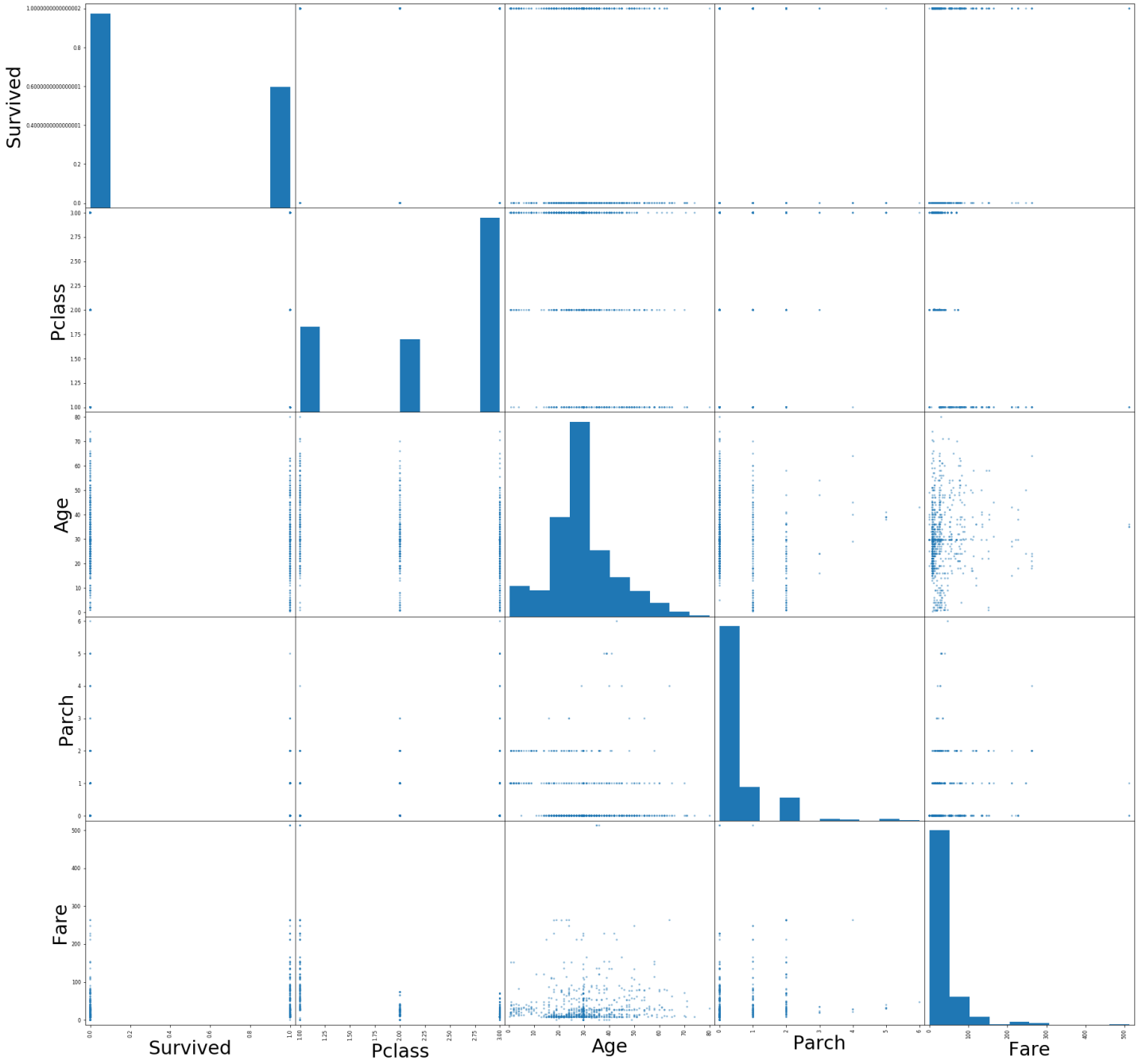
In [22]:

```
Axes = scatter_matrix(data[attributes], figsize = (30,30) )
#y labels
[plt.setp(item.yaxis.get_label(), 'size', 30) for item in Axes.ravel()]
#x labels
[plt.setp(item.xaxis.get_label(), 'size', 30) for item in Axes.ravel()]
```

Out[22]:

```
[[None, None],
 [None, None]
```

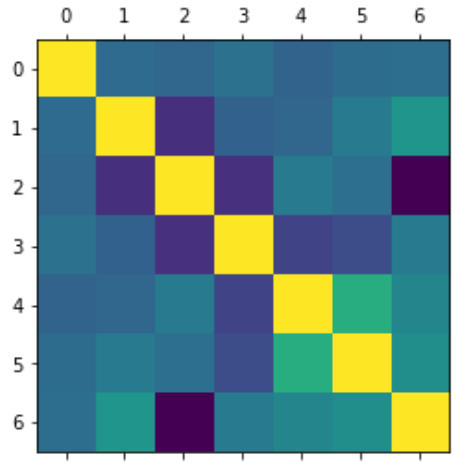
```
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None],
[None, None]]
```



In [23]:

```
plt.matshow(data.corr())
```

```
plt.show()
```

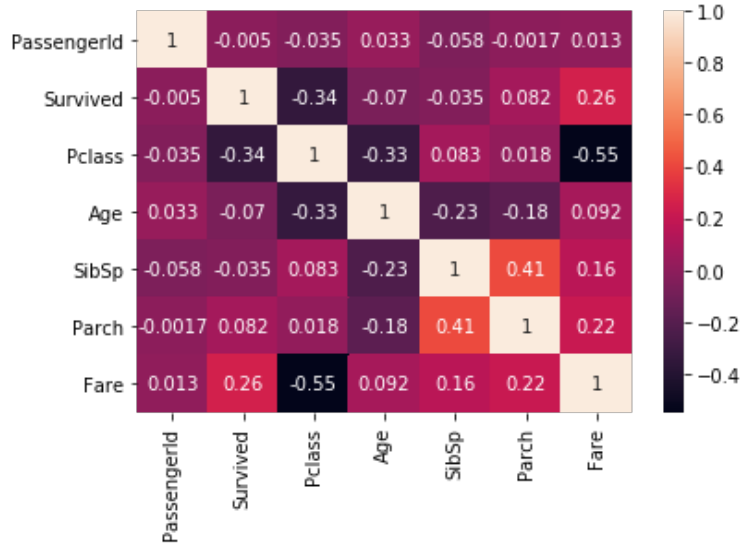


In [24]:

```
corr = data.corr()
sns.heatmap(corr, xticklabels = corr.columns.values,
                  yticklabels = corr.columns.values, annot = True, cbar = True)
```

Out[24]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x1e00bd01148>
```

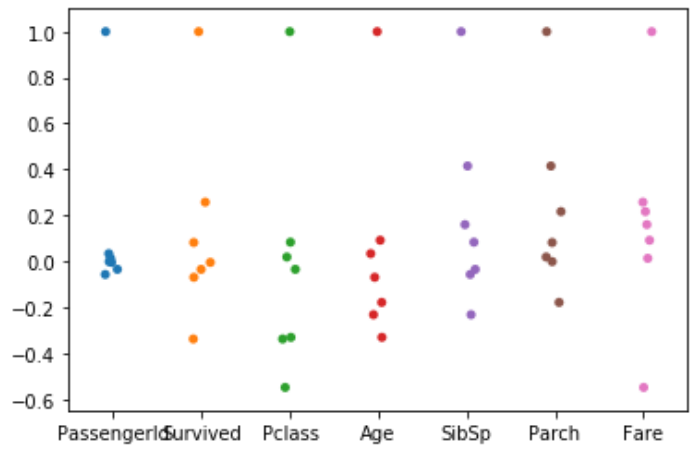


In [25]:

```
sns.stripplot(data =corr, jitter = True, dodge = True)
```

Out[25]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x1e00d5b2a48>
```

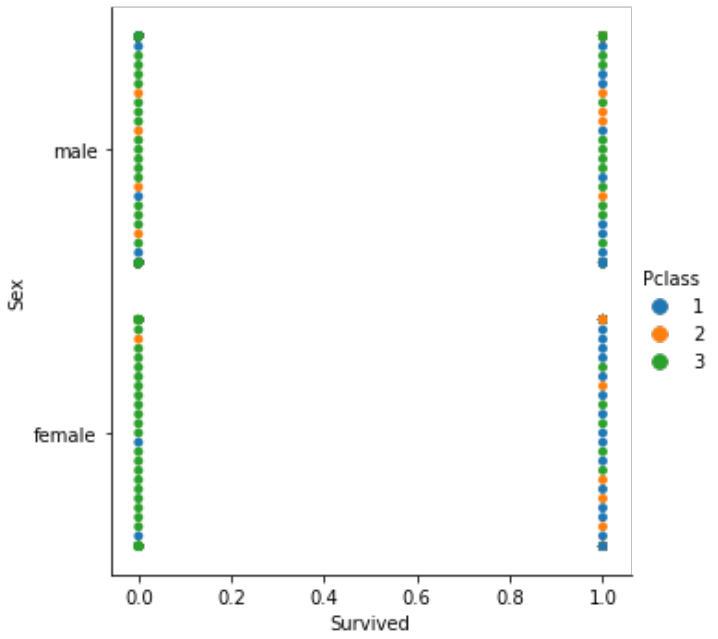


In [26]:

```
sns.catplot(x = 'Survived', y = 'Sex', hue = 'Pclass', kind = 'swarm'  , data=data)
```

Out[26]:

```
<seaborn.axisgrid.FacetGrid at 0x1e00c29c808>
```



In [27]:

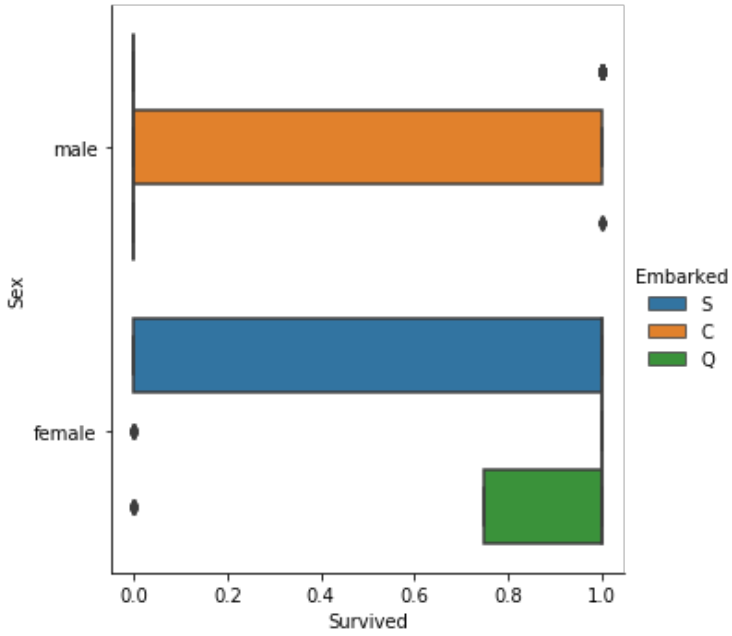
```
# It is clear from the above catplot that the passenegrs with Pclass 1 tend to survive mo
re
```

In [28]:

```
sns.catplot(x = 'Survived' , y = 'Sex' ,hue = 'Embarked',  kind = 'box' , data = data)
```

Out[28]:

```
<seaborn.axisgrid.FacetGrid at 0x1e00bc0d388>
```

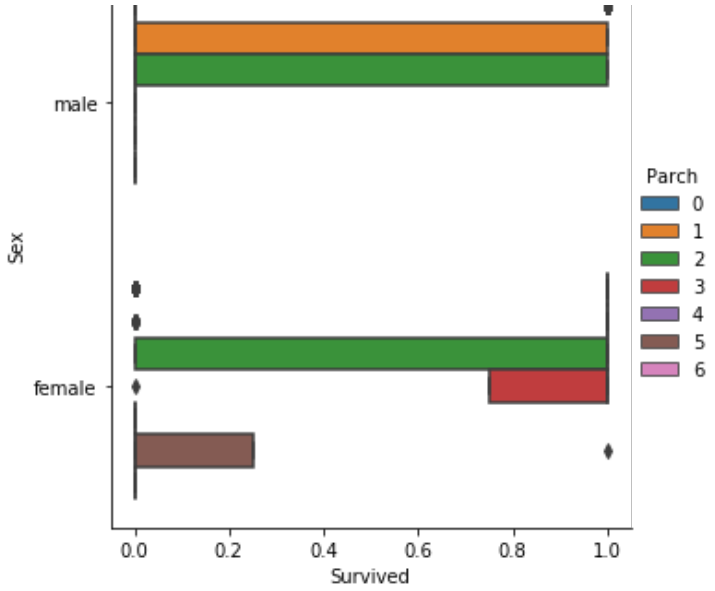


In [29]:

```
sns.catplot(x = 'Survived' , y = 'Sex' ,hue = 'Parch',  kind = 'box' , data = data)
# Passengers with parch 3 survived more
```

Out[29]:

```
<seaborn.axisgrid.FacetGrid at 0x1e00cb96988>
```

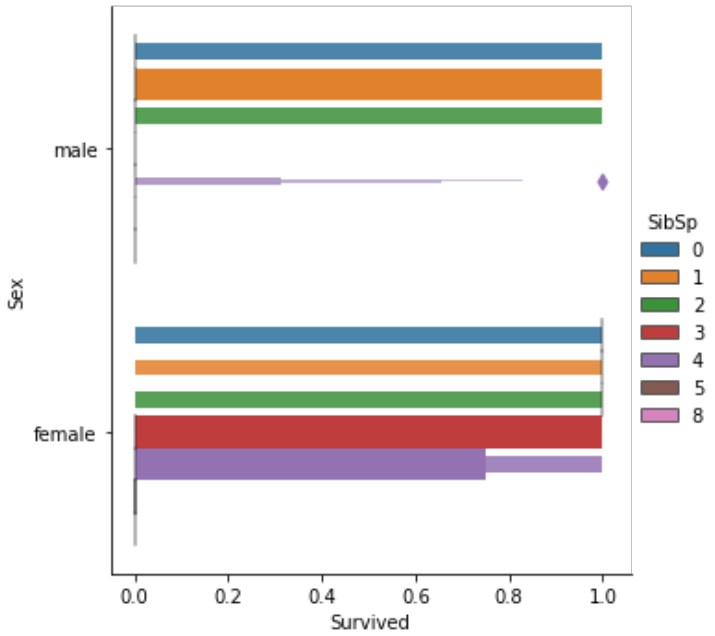


In [30]:

```
sns.catplot(x = 'Survived' , y = 'Sex' ,hue = 'SibSp',  kind = 'boxen' , data = data)
```

Out[30]:

```
<seaborn.axisgrid.FacetGrid at 0x1e00bf463c8>
```

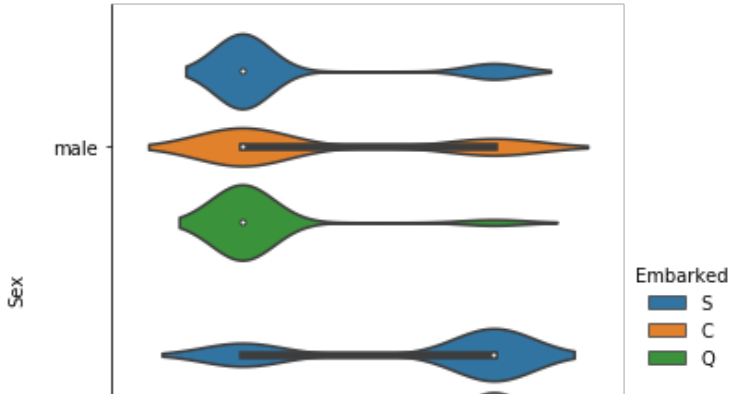


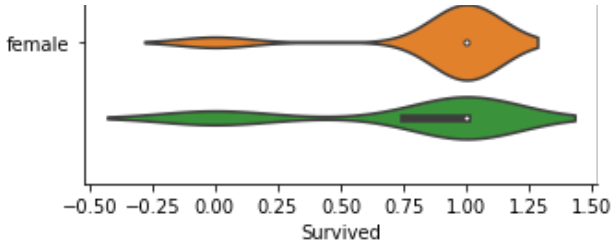
In [31]:

```
sns.catplot(x = 'Survived' , y = 'Sex' ,hue = 'Embarked',  kind = 'violin' , data = data
)
# females survuved more than males.
```

Out[31]:

```
<seaborn.axisgrid.FacetGrid at 0x1e00c0b7288>
```



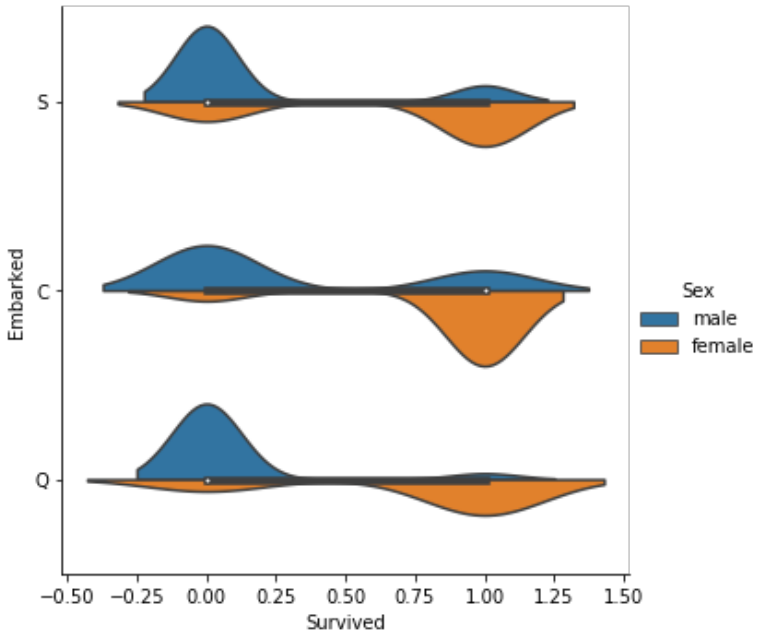


In [32]:

```
sns.catplot(x="Survived", y="Embarked", hue="Sex",
            kind="violin", split=True, data=data)
# females who were embarked in C survived more
```

Out[32]:

```
<seaborn.axisgrid.FacetGrid at 0x1e00c2d7908>
```



In [33]:

```
sns.catplot(x="Sex", y="Survived", hue="Embarked", kind="point", data=data)
#again, female with embarkment in C survived more
```

Out[33]:

```
<seaborn.axisgrid.FacetGrid at 0x1e00c2b4208>
```