code

May 10, 2024

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

[2]:
```
data = pd.read_csv('https://raw.githubusercontent.com/dphi-official/Datasets/
↪master/titanic_data.csv')
data
```

[2]:
```
     PassengerId  Survived  Pclass  \
0              1         0       3
1              2         1       1
2              3         1       3
3              4         1       1
4              5         0       3
..           …       …     …
886          887         0       2
887          888         1       1
888          889         0       3
889          890         1       1
890          891         0       3

                                                 Name     Sex   Age  SibSp  \
0                             Braund, Mr. Owen Harris    male  22.0      1
1    Cumings, Mrs. John Bradley (Florence Briggs Th…  female  38.0      1
2                              Heikkinen, Miss. Laina  female  26.0      0
3        Futrelle, Mrs. Jacques Heath (Lily May Peel)  female  35.0      1
4                            Allen, Mr. William Henry    male  35.0      0
..                                                 …     …   …    …
886                            Montvila, Rev. Juozas    male  27.0      0
887                     Graham, Miss. Margaret Edith  female  19.0      0
888         Johnston, Miss. Catherine Helen "Carrie"  female   NaN      1
889                            Behr, Mr. Karl Howell    male  26.0      0
890                              Dooley, Mr. Patrick    male  32.0      0

     Parch            Ticket     Fare Cabin Embarked
0        0         A/5 21171   7.2500   NaN        S
```

```
1        0          PC 17599  71.2833   C85        C
2        0  STON/O2. 3101282   7.9250   NaN        S
3        0            113803  53.1000  C123        S
4        0            373450   8.0500   NaN        S
..     …                …       …   …      …
886      0            211536  13.0000   NaN        S
887      0            112053  30.0000   B42        S
888      2        W./C. 6607  23.4500   NaN        S
889      0            111369  30.0000  C148        C
890      0            370376   7.7500   NaN        Q

[891 rows x 12 columns]
```

[3]:
```
data.shape
```

[3]:
```
(891, 12)
```

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

[4]:
```
       PassengerId    Survived      Pclass         Age       SibSp  \
count   891.000000  891.000000  891.000000  714.000000  891.000000
mean    446.000000    0.383838    2.308642   29.699118    0.523008
std     257.353842    0.486592    0.836071   14.526497    1.102743
min       1.000000    0.000000    1.000000    0.420000    0.000000
25%     223.500000    0.000000    2.000000   20.125000    0.000000
50%     446.000000    0.000000    3.000000   28.000000    0.000000
75%     668.500000    1.000000    3.000000   38.000000    1.000000
max     891.000000    1.000000    3.000000   80.000000    8.000000

            Parch        Fare
count  891.000000  891.000000
mean     0.381594   32.204208
std      0.806057   49.693429
min      0.000000    0.000000
25%      0.000000    7.910400
50%      0.000000   14.454200
75%      0.000000   31.000000
max      6.000000  512.329200
```

[5]:
```
data.describe(include = 'object')
```

[5]:
```
                           Name   Sex  Ticket    Cabin Embarked
count                       891   891     891      204      889
unique                      891     2     681      147        3
top     Braund, Mr. Owen Harris  male  347082  B96 B98        S
freq                          1   577       7        4      644
```

[6]:
```
data.isnull().sum()
```

[6]:
```
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
```

[7]:
```
data['Age'] = data['Age'].fillna(np.mean(data['Age']))
```

[8]:
```
data['Cabin'] = data['Cabin'].fillna(data['Cabin'].mode()[0])
```

[9]:
```
data['Embarked'] = data['Embarked'].fillna(data['Embarked'].mode()[0])
```

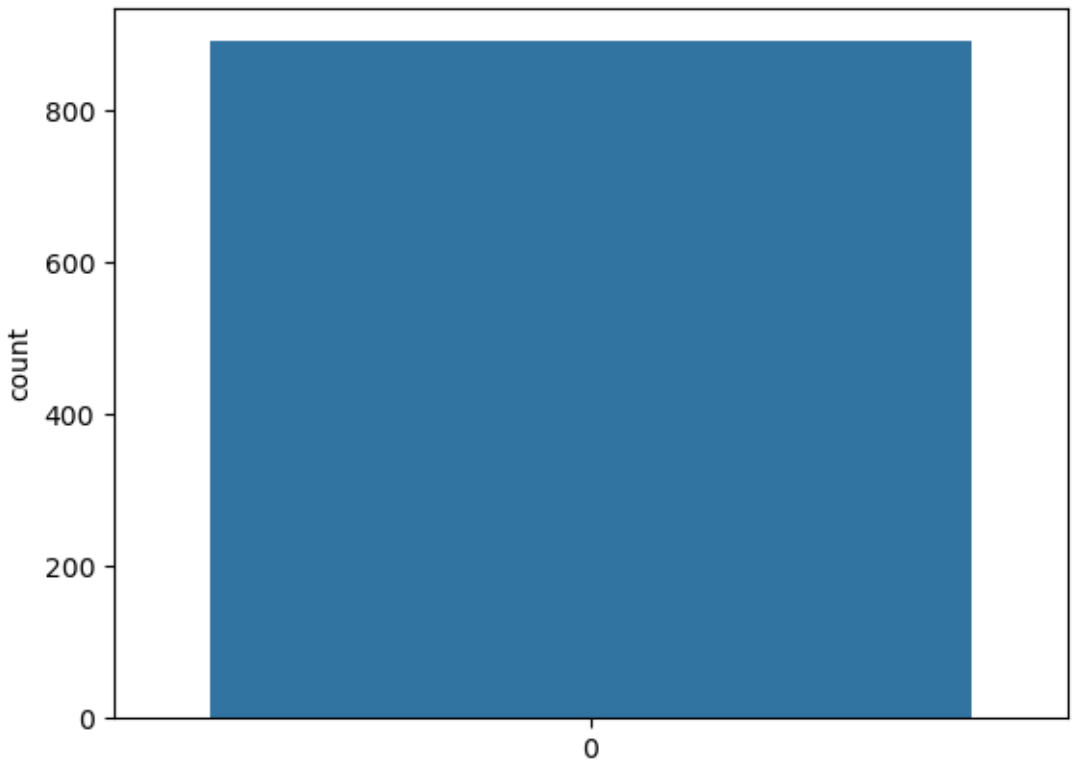
[10]:
```
data.isnull().sum()
```

[10]:
```
PassengerId    0
Survived       0
Pclass         0
Name           0
Sex            0
Age            0
SibSp          0
Parch          0
Ticket         0
Fare           0
Cabin          0
Embarked       0
dtype: int64
```

[45]:
```
# Replace infinite values (inf and -inf) with NaN
data.replace([np.inf, -np.inf], np.nan, inplace=True)
```

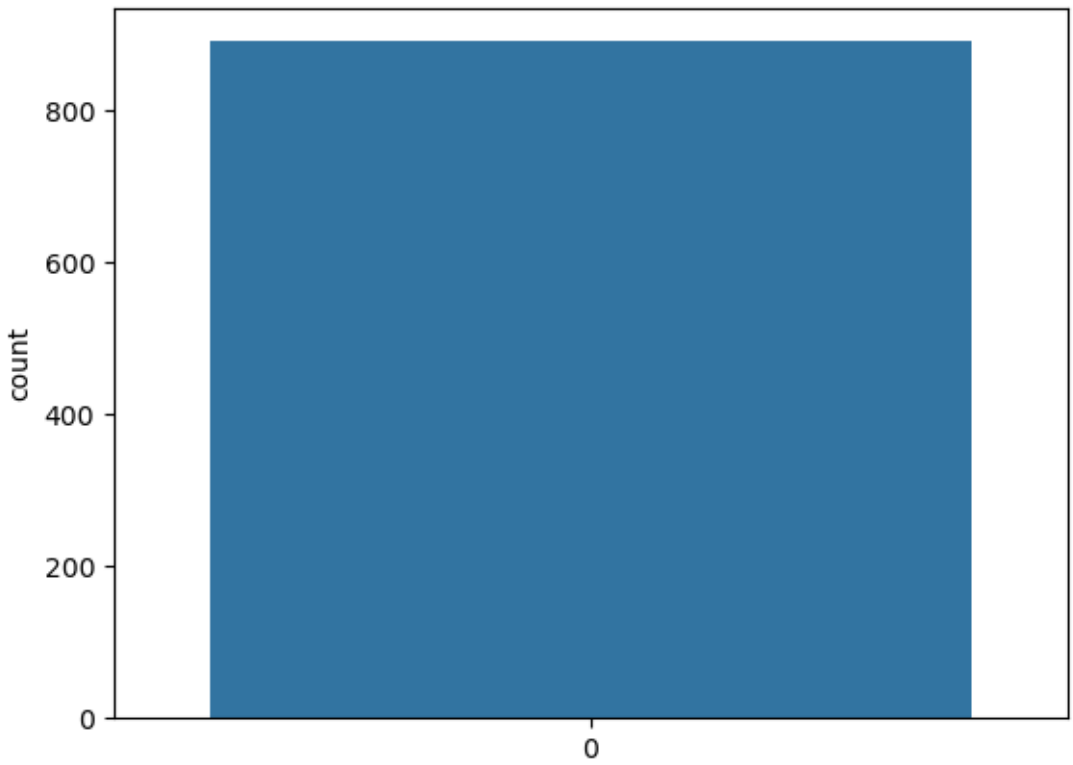
[11]:
```
sns.countplot(data['Survived'])
```

[11]:
```
<Axes: ylabel='count'>
```



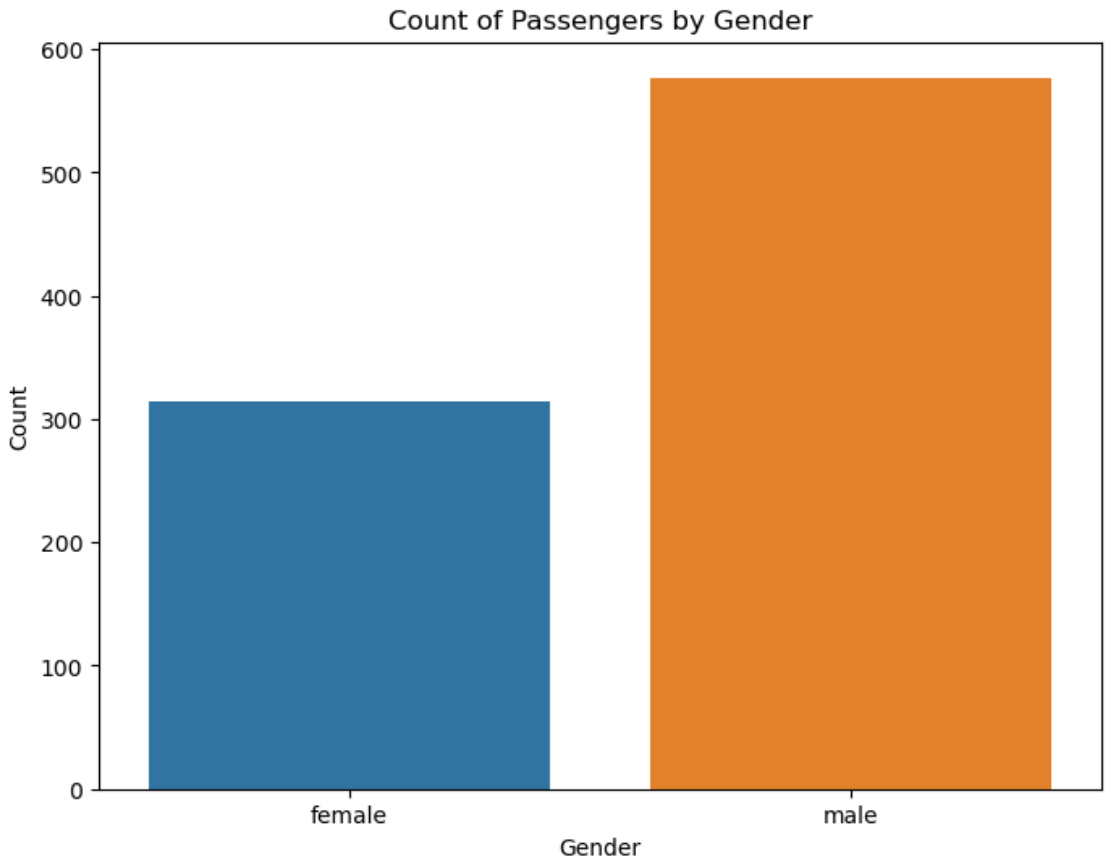
[12]:
```
sns.countplot(data['Pclass'])
```

[12]: <Axes: ylabel='count'>



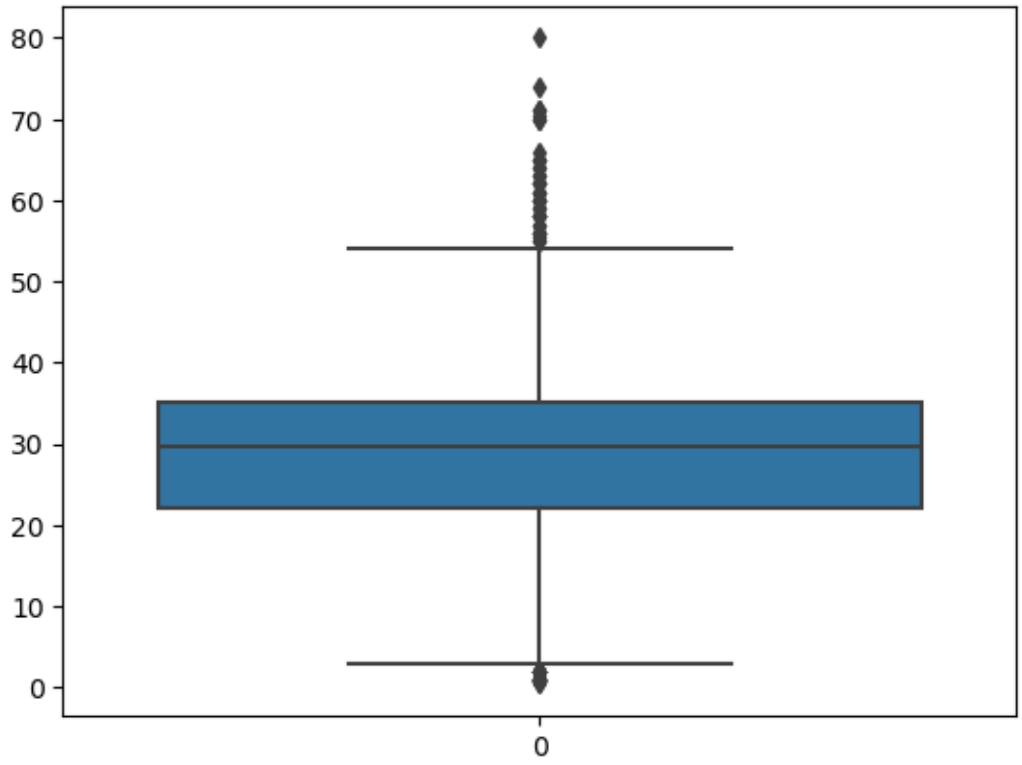
[46]:
```
# Convert 'Sex' column to categorical data type
data['Sex'] = data['Sex'].astype('category')

# Plot count of each category in 'Sex'
plt.figure(figsize=(8, 6))
sns.countplot(x='Sex', data=data)
plt.title('Count of Passengers by Gender')
plt.xlabel('Gender')
plt.ylabel('Count')
plt.show()
```

```
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\categorical.py:641:
FutureWarning: The default of observed=False is deprecated and will be changed
to True in a future version of pandas. Pass observed=False to retain current
behavior or observed=True to adopt the future default and silence this warning.
  grouped_vals = vals.groupby(grouper)
```



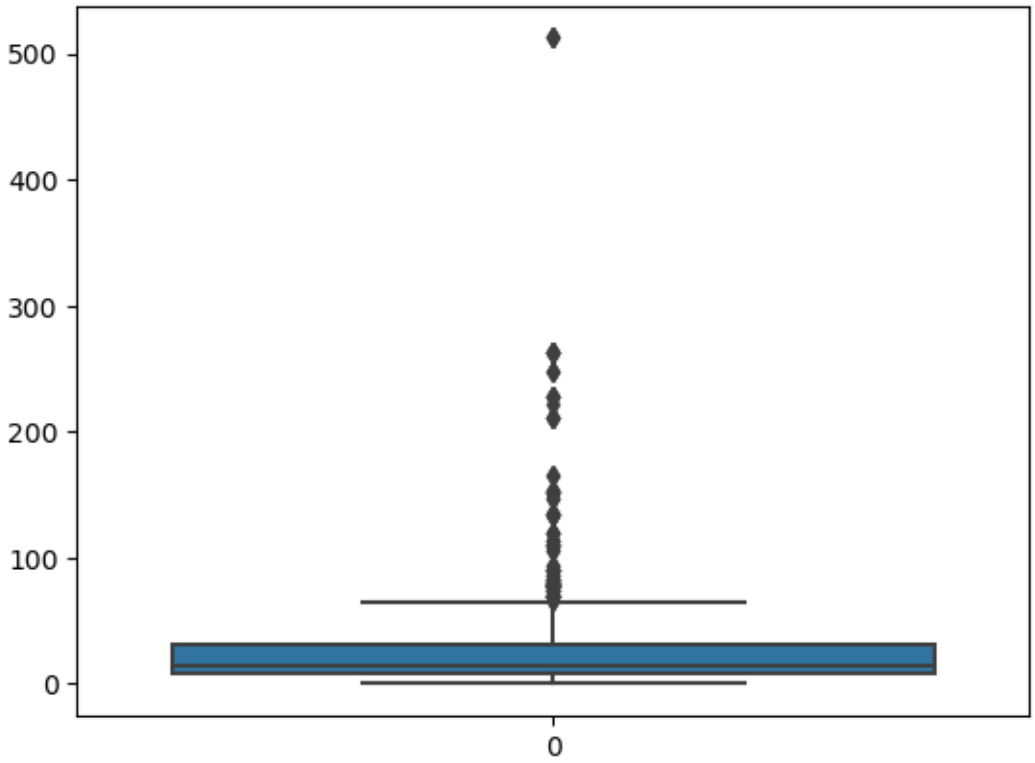
[17]:
```
sns.boxplot(data['Age'])
```

[17]: <Axes: >



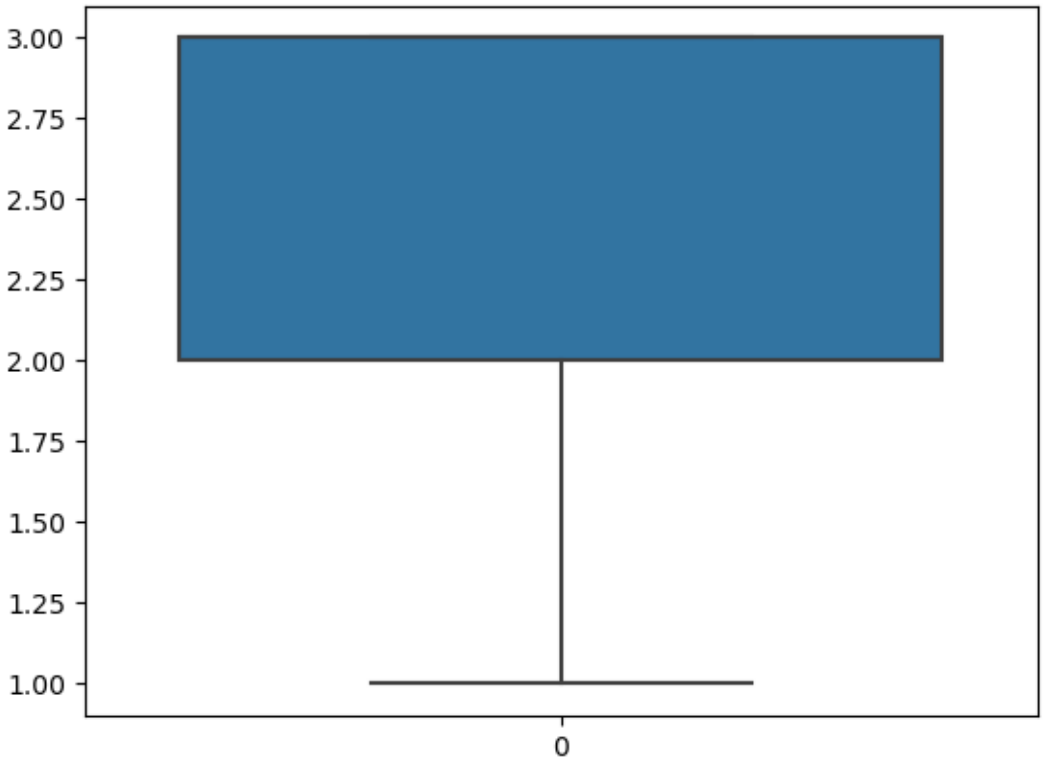
[18]:
```
sns.boxplot(data['Fare'])
```

[18]: <Axes: >



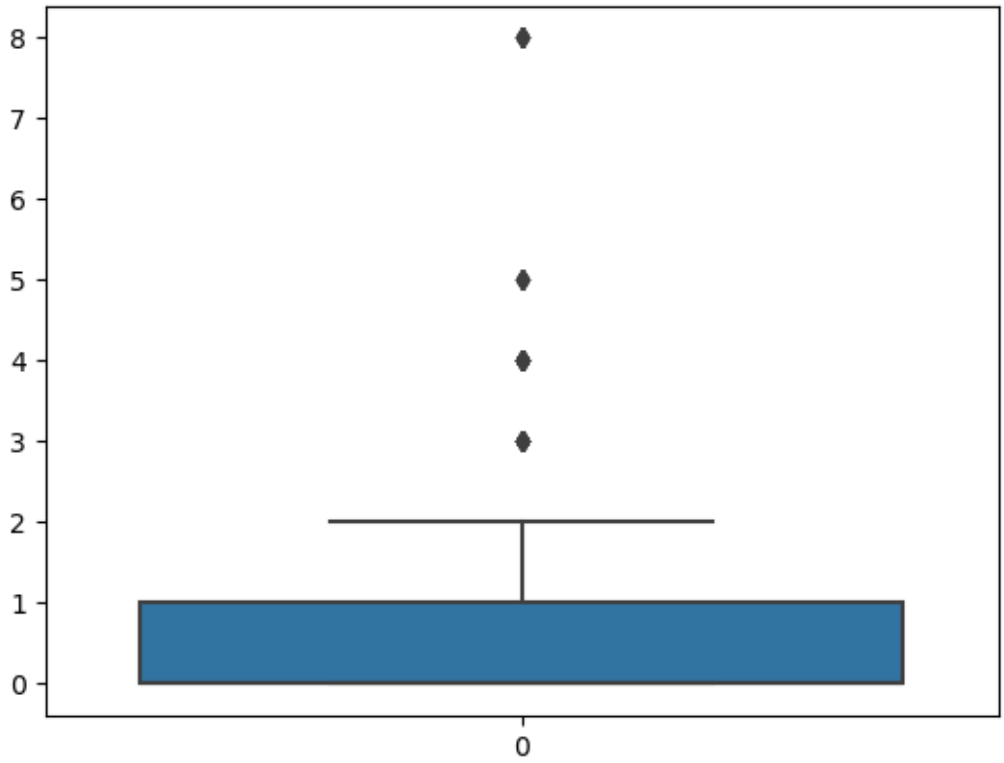
[19]:
```
sns.boxplot(data['Pclass'])
```

[19]: <Axes: >



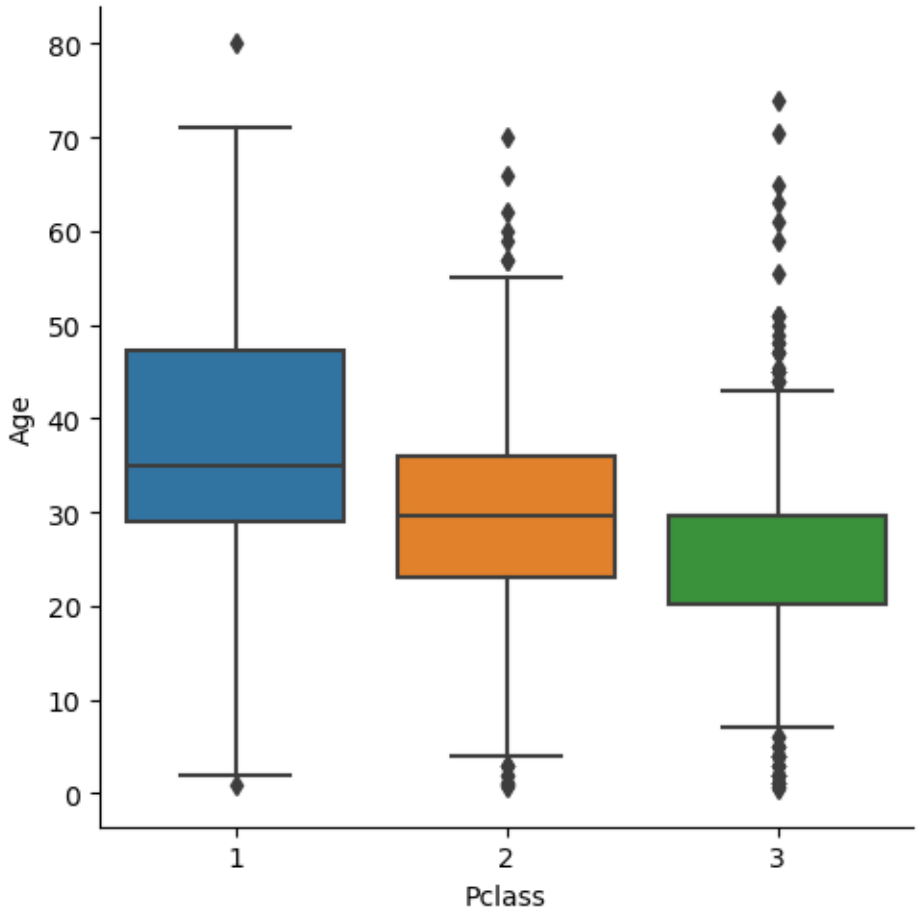
[20]:
```
sns.boxplot(data['SibSp'])
```

[20]: <Axes: >



[21]:
```
sns.catplot(x= 'Pclass', y = 'Age', data=data, kind = 'box')
```

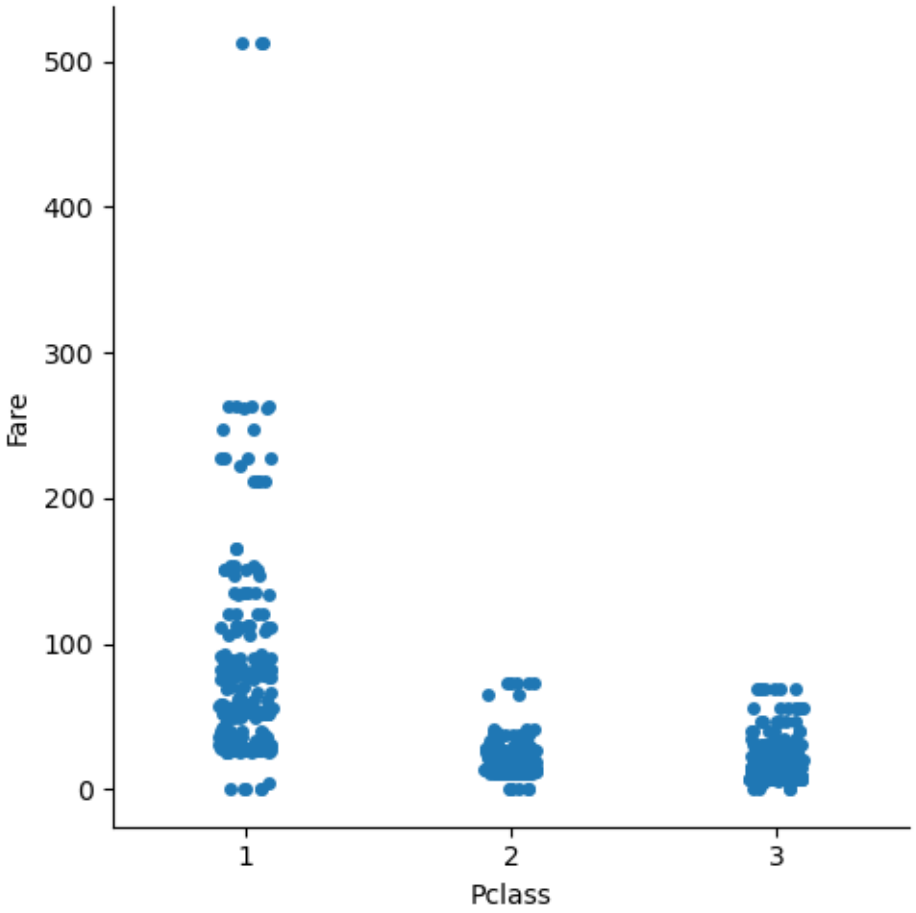
[21]:
```
<seaborn.axisgrid.FacetGrid at 0x28e72677f90>
```



[47]:
```
sns.catplot(x= 'Pclass', y = 'Fare', data=data, kind = 'strip')
```

```
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
```

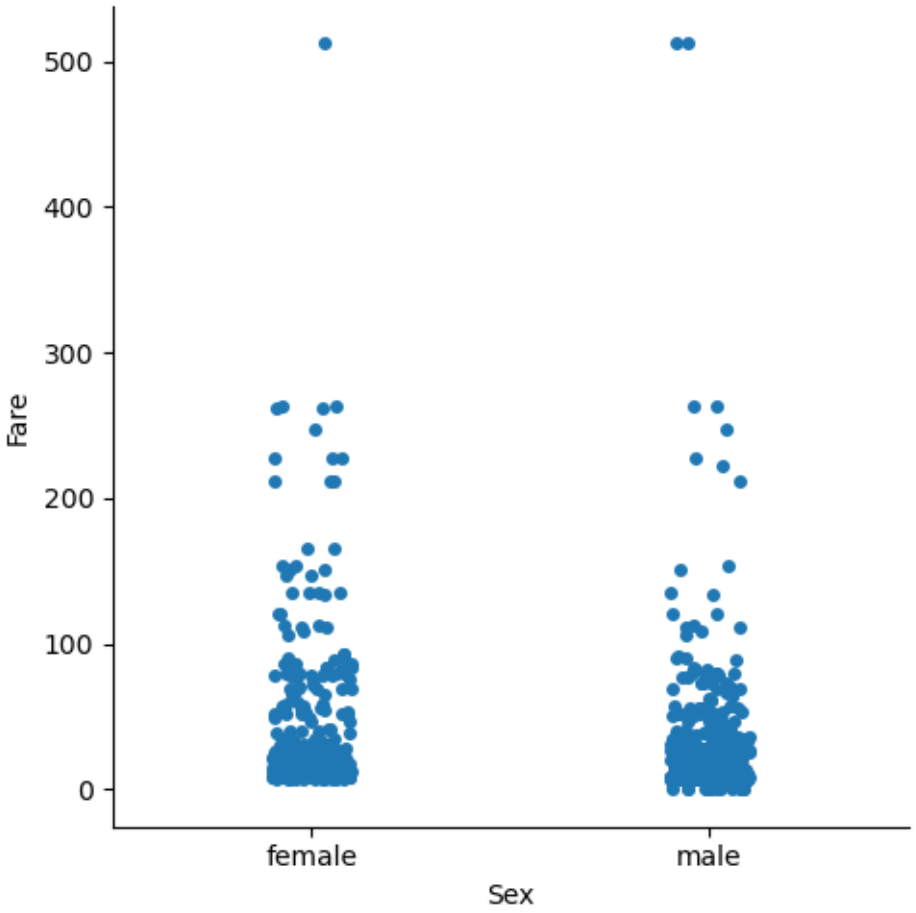
[47]: `<seaborn.axisgrid.FacetGrid at 0x28e7eb730d0>`



[23]:
```
sns.catplot(x= 'Sex', y = 'Fare', data=data, kind = 'strip')
```

```
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
```

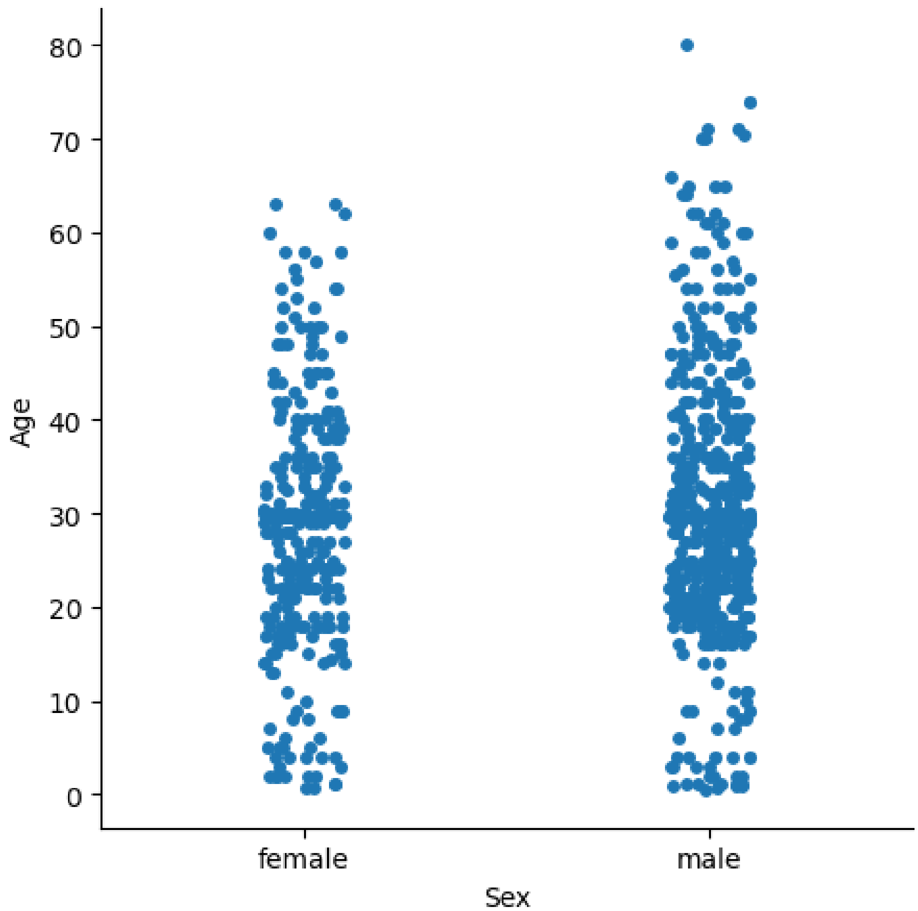
[23]:
```
<seaborn.axisgrid.FacetGrid at 0x28e72328dd0>
```



[24]:
```
sns.catplot(x= 'Sex', y = 'Age', data=data, kind = 'strip')
```

```
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
```

[24]:
```
<seaborn.axisgrid.FacetGrid at 0x28e7236c950>
```



[44]:
```
sns.pairplot(data)
```

```
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
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  with pd.option_context('mode.use_inf_as_na', True):
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
```
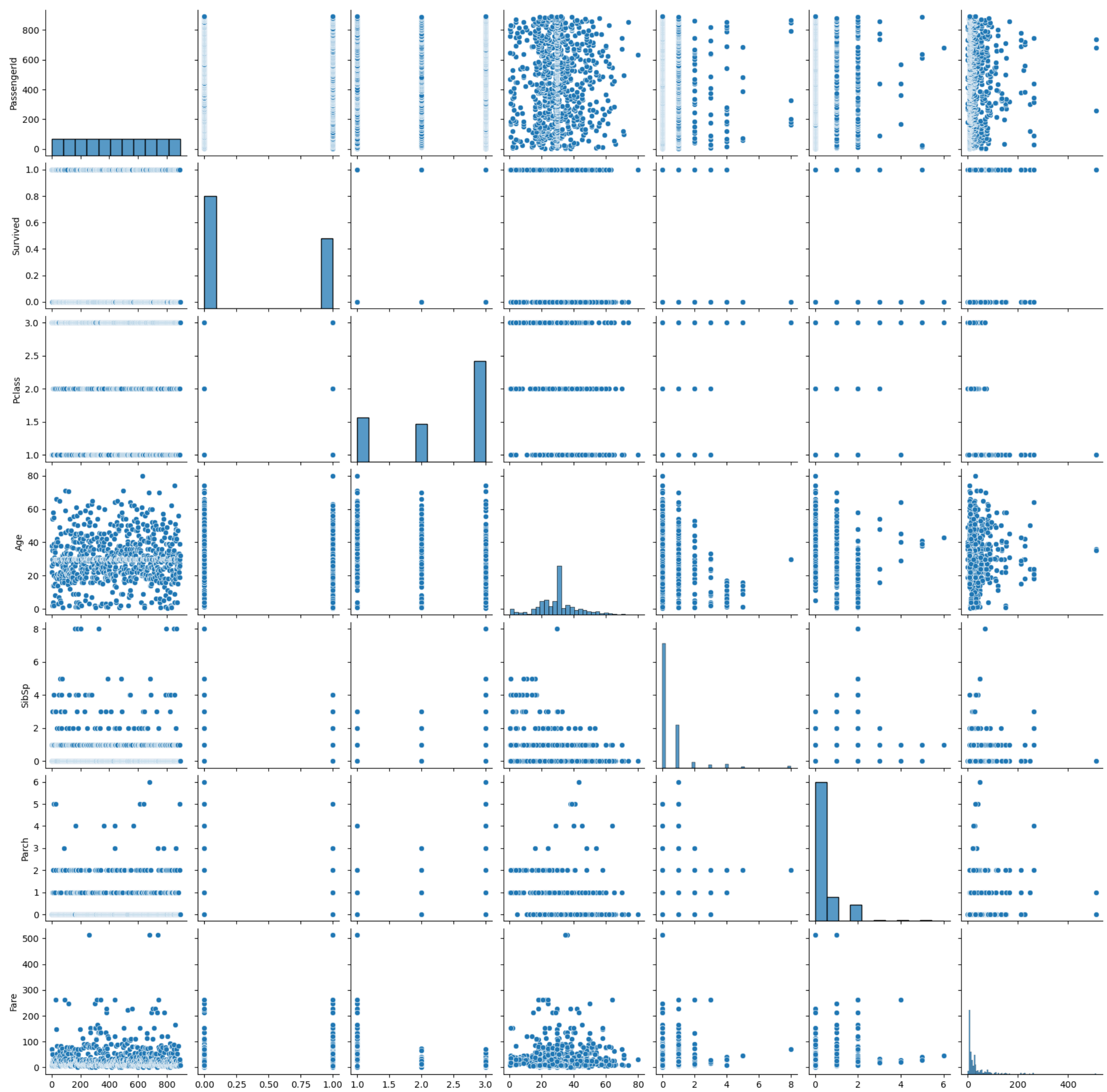
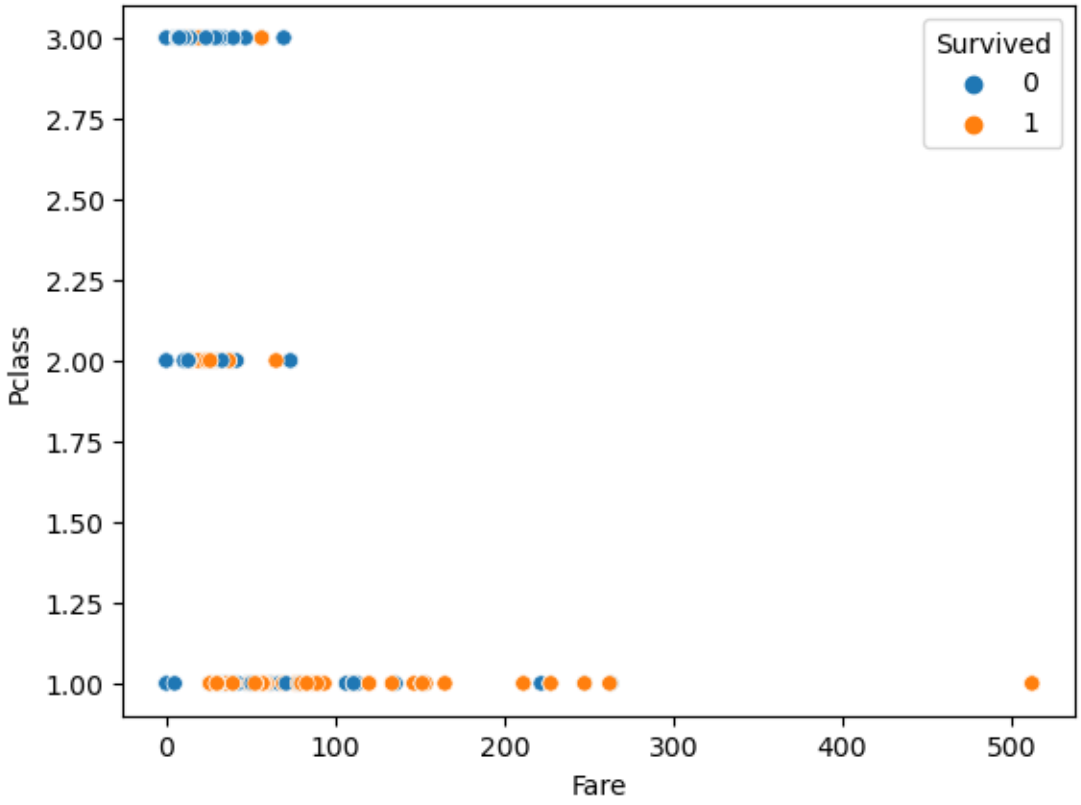

```
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
```

[44]: <seaborn.axisgrid.PairGrid at 0x28e7cd72b10>



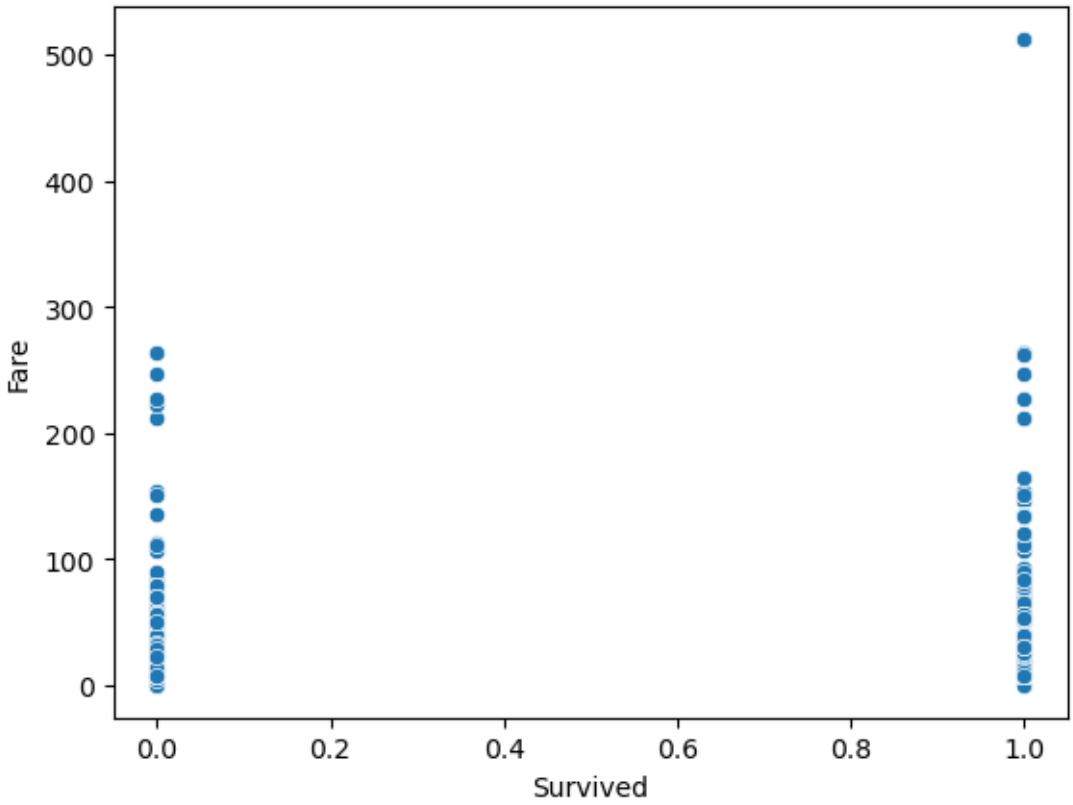
[26]:
```
sns.scatterplot(x = 'Fare', y = 'Pclass', hue = 'Survived', data = data)
```

[26]: <Axes: xlabel='Fare', ylabel='Pclass'>



[27]:
```
sns.scatterplot(x = 'Survived', y = 'Fare', data = data)
```

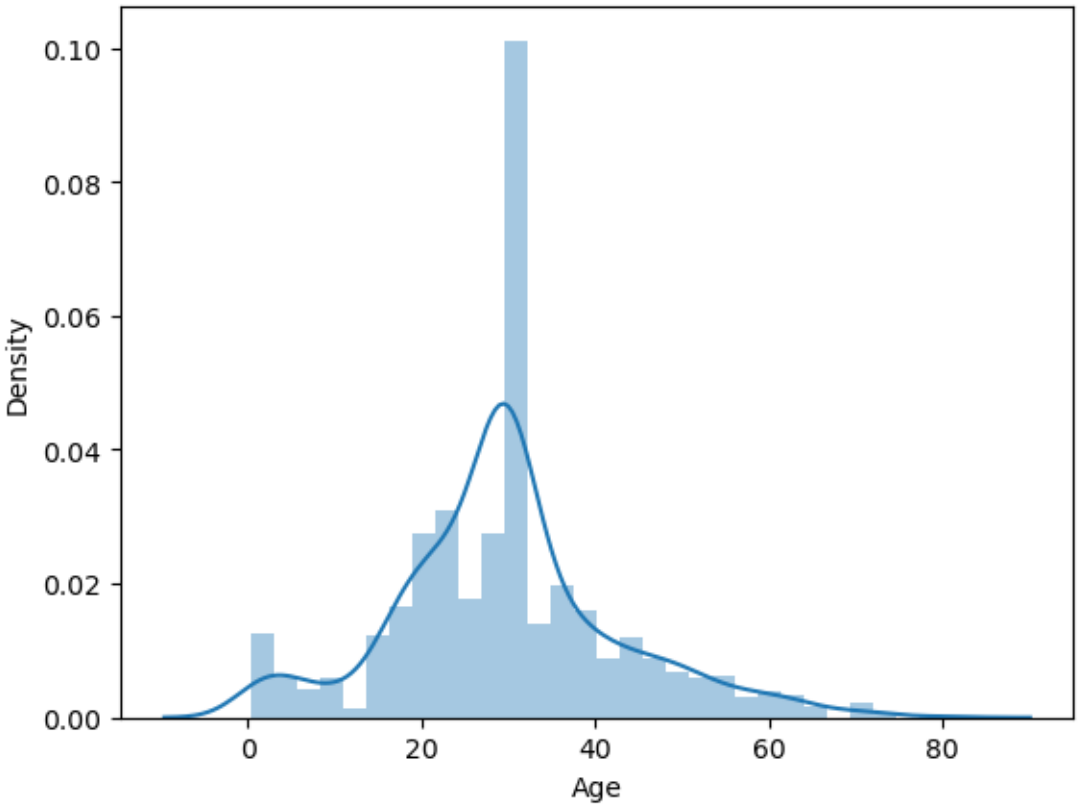
[27]: <Axes: xlabel='Survived', ylabel='Fare'>



[28]:
```
sns.distplot(data['Age'])
```

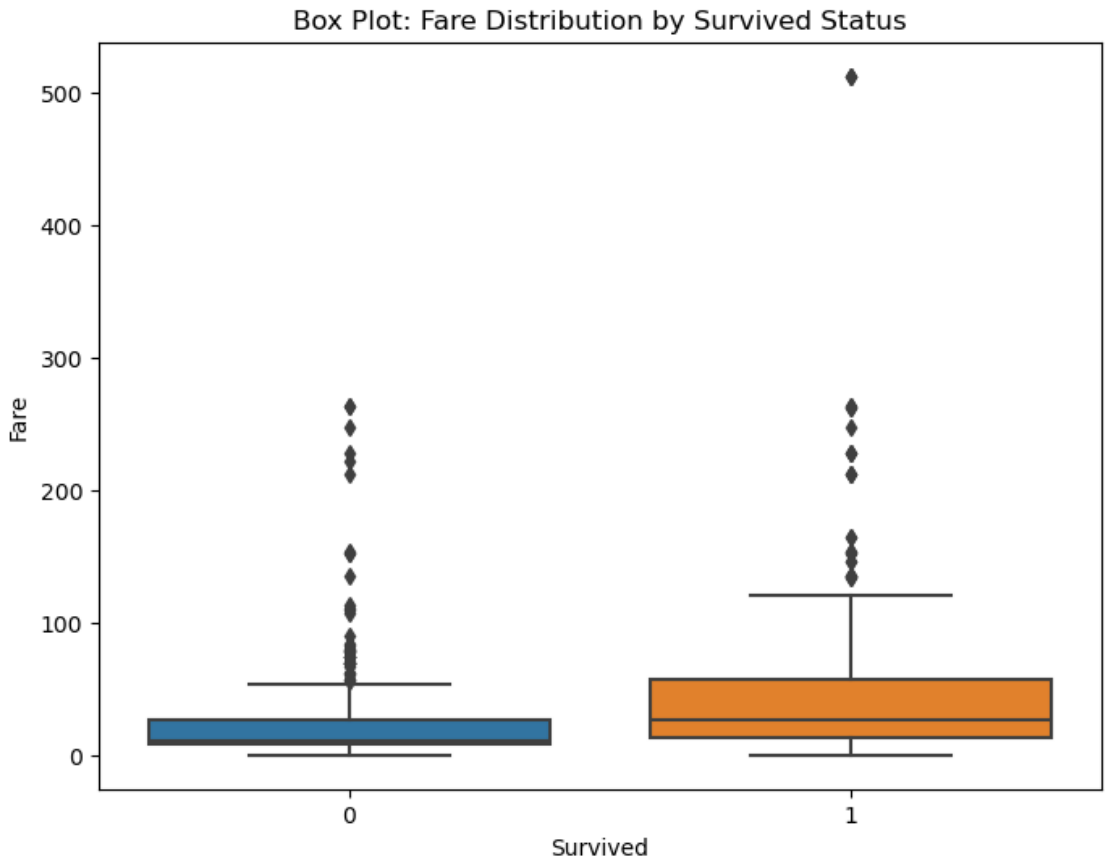
```
C:\Users\ADMIN\AppData\Local\Temp\ipykernel_21684\2317092479.py:1: UserWarning:

`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with
similar flexibility) or `histplot` (an axes-level function for histograms).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751

  sns.distplot(data['Age'])
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
```

[28]:
```
<Axes: xlabel='Age', ylabel='Density'>
```



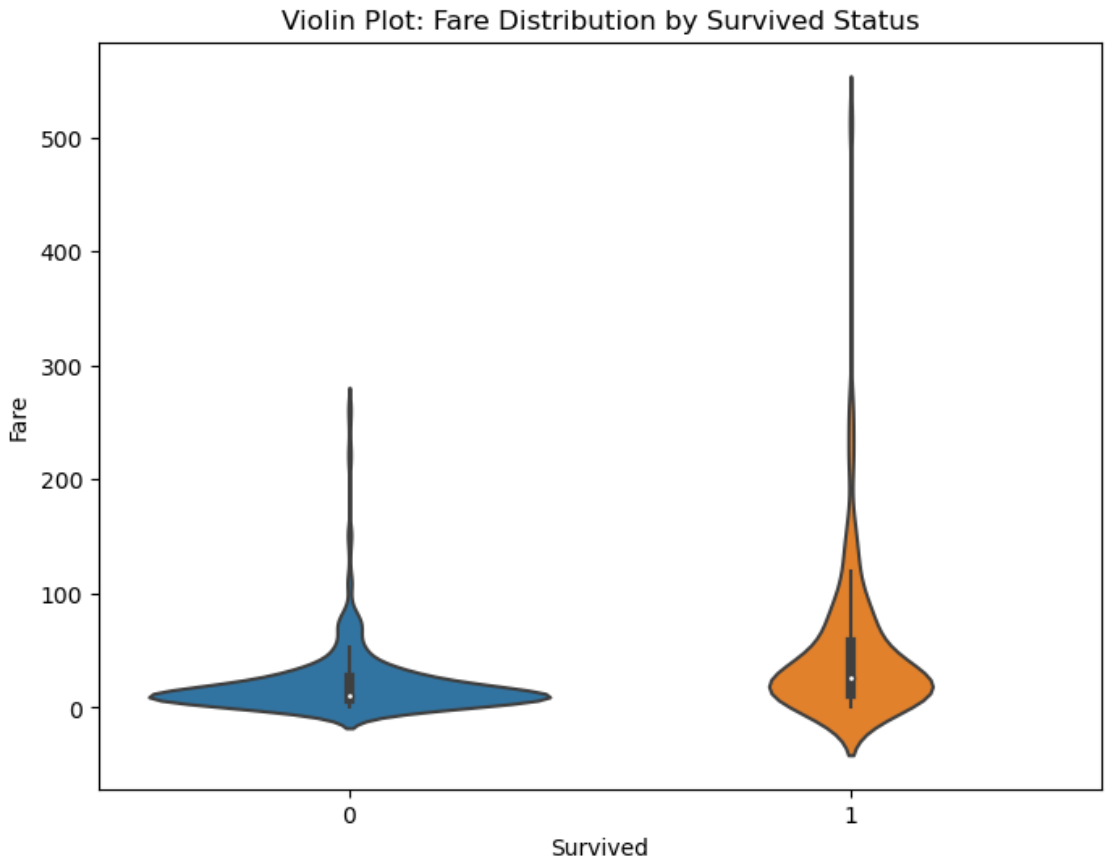
[40]:
```
# Plot box plot between 'Survived' and 'Fare' using cleaned data
plt.figure(figsize=(8, 6))
sns.boxplot(x='Survived', y='Fare', data=data_cleaned)
plt.title('Box Plot: Fare Distribution by Survived Status')
plt.xlabel('Survived')
plt.ylabel('Fare')
plt.show()
```

```
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\categorical.py:641:
FutureWarning: The default of observed=False is deprecated and will be changed
to True in a future version of pandas. Pass observed=False to retain current
behavior or observed=True to adopt the future default and silence this warning.
  grouped_vals = vals.groupby(grouper)
```



[41]:
```
# Plot violin plot between 'Survived' and 'Fare' using cleaned data
plt.figure(figsize=(8, 6))
sns.violinplot(x='Survived', y='Fare', data=data_cleaned)
plt.title('Violin Plot: Fare Distribution by Survived Status')
plt.xlabel('Survived')
plt.ylabel('Fare')
plt.show()
```

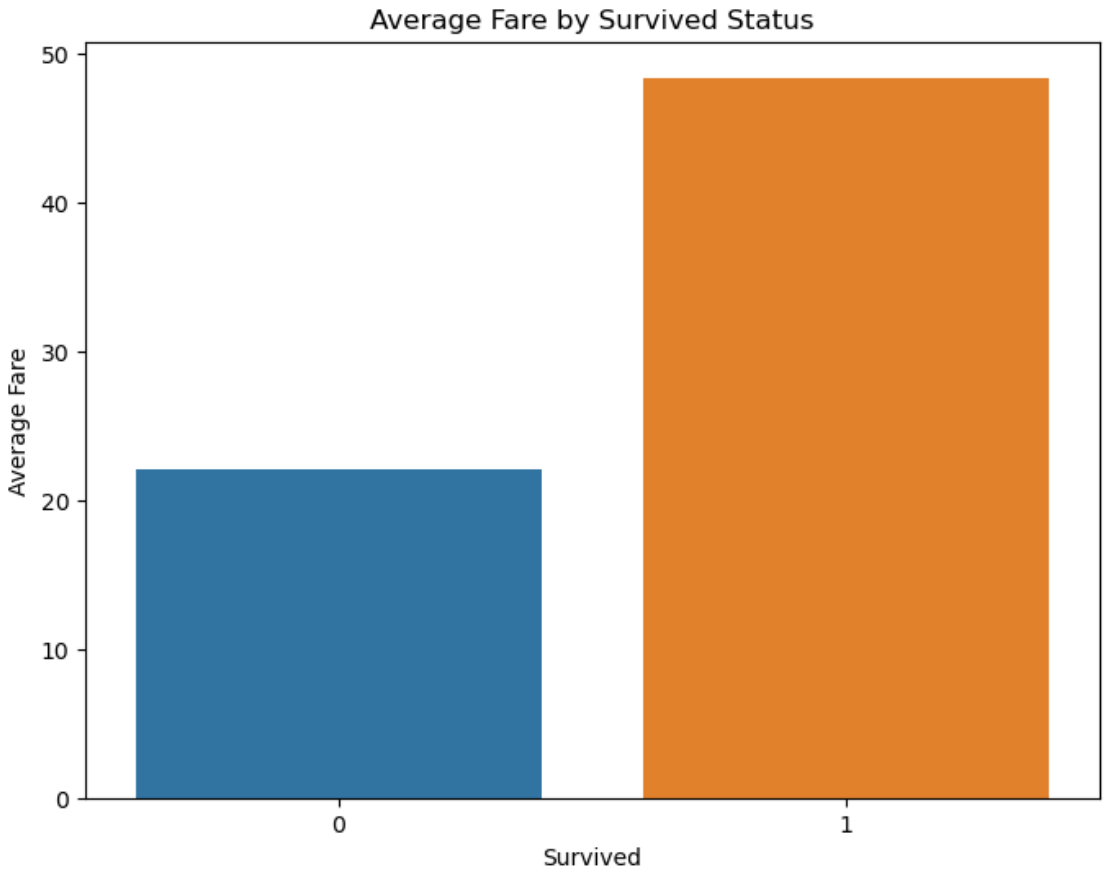
```
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\categorical.py:641:
FutureWarning: The default of observed=False is deprecated and will be changed
to True in a future version of pandas. Pass observed=False to retain current
behavior or observed=True to adopt the future default and silence this warning.
  grouped_vals = vals.groupby(grouper)
```



[42]:
```
# Calculate mean or median Fare by Survived status
fare_summary = data_cleaned.groupby('Survived')['Fare'].mean()  # or .median()

# Plot bar plot for Fare by Survived status
plt.figure(figsize=(8, 6))
sns.barplot(x=fare_summary.index, y=fare_summary.values)
plt.title('Average Fare by Survived Status')
plt.xlabel('Survived')
plt.ylabel('Average Fare')
plt.show()
```

```
C:\Users\ADMIN\AppData\Local\Temp\ipykernel_21684\3820872734.py:2:
FutureWarning: The default of observed=False is deprecated and will be changed
to True in a future version of pandas. Pass observed=False to retain current
behavior or observed=True to adopt the future default and silence this warning.
  fare_summary = data_cleaned.groupby('Survived')['Fare'].mean()  # or .median()
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\categorical.py:641:
FutureWarning: The default of observed=False is deprecated and will be changed
to True in a future version of pandas. Pass observed=False to retain current
behavior or observed=True to adopt the future default and silence this warning.
```

```
grouped_vals = vals.groupby(grouper)
```



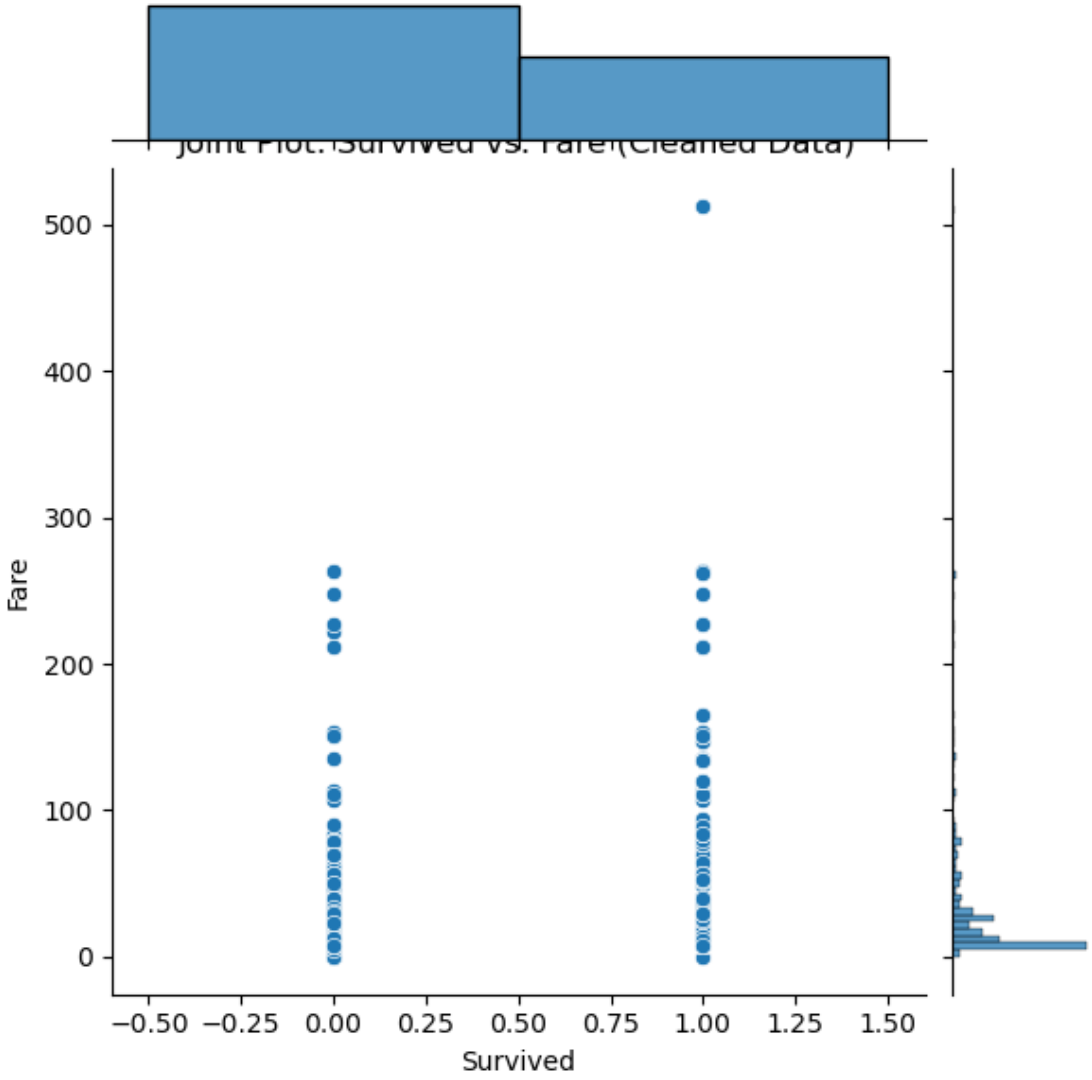
[37]:
```
# Replace infinite values (inf) and negative infinite values (-inf) with NaN
data.replace([np.inf, -np.inf], np.nan, inplace=True)
```

[38]:
```
# Drop rows containing NaN values in relevant columns (e.g., 'Survived', 'Fare')
data_cleaned = data.dropna(subset=['Survived', 'Fare'])
```

[39]:
```
# Convert 'Survived' column to categorical for better visualization
data_cleaned['Survived'] = data_cleaned['Survived'].astype('category')

# Plot joint plot between 'Survived' and 'Fare' using cleaned data
sns.jointplot(x='Survived', y='Fare', kind='scatter', data=data_cleaned)
plt.title('Joint Plot: Survived vs. Fare (Cleaned Data)')
plt.show()
```

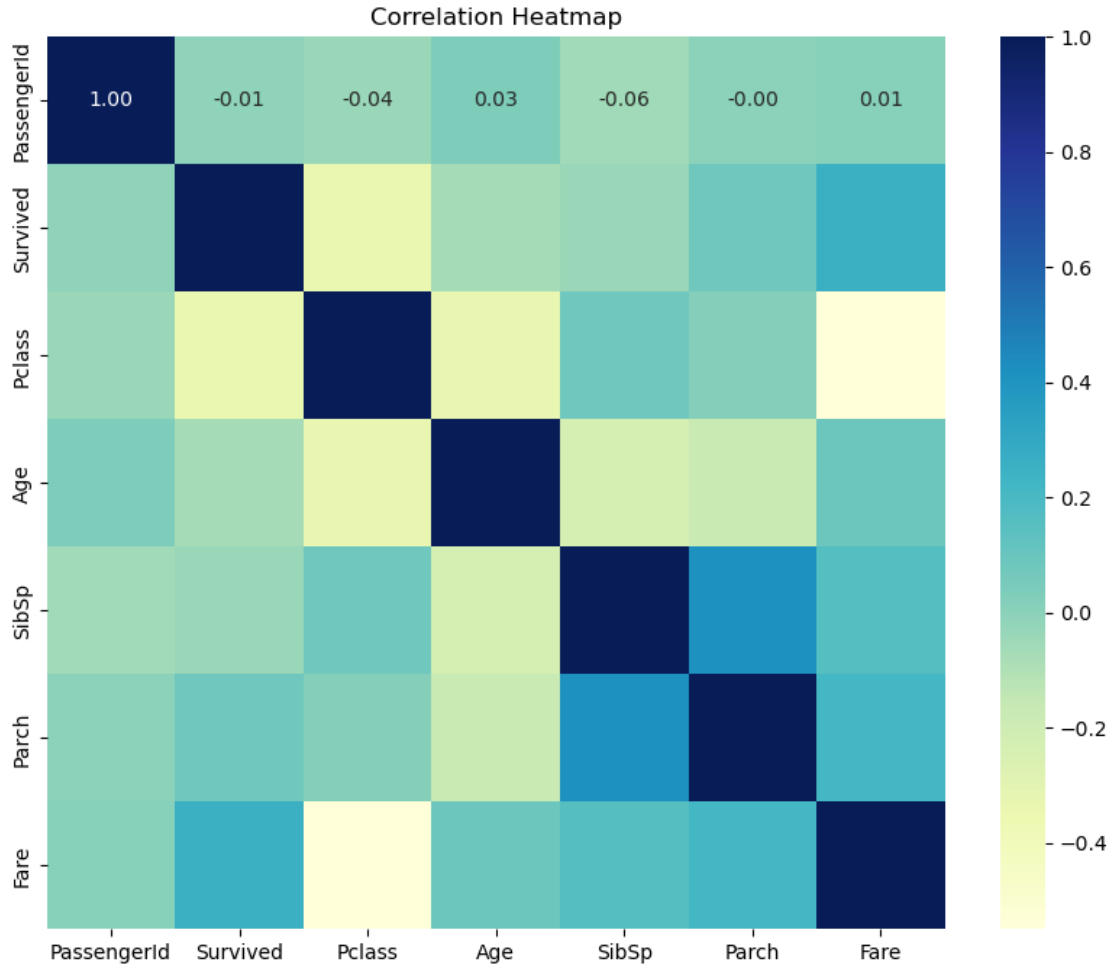
```
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
```

```
C:\Users\ADMIN\anaconda3\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
```



[33]:
```
# Drop non-numeric columns for correlation analysis
numeric_columns = data.select_dtypes(include=['int64', 'float64']).columns
numeric_data = data[numeric_columns]

# Compute correlation matrix
tc = numeric_data.corr()

# Plot heatmap of correlations
```

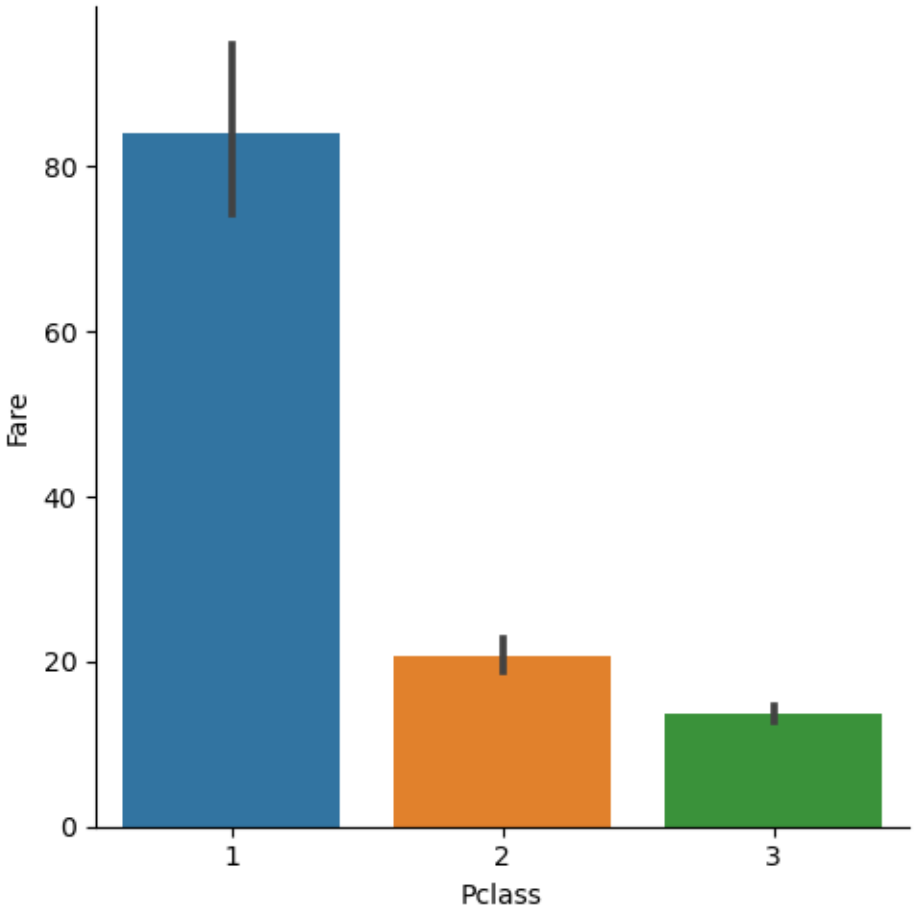
```
plt.figure(figsize=(10, 8))
sns.heatmap(tc, annot=True, cmap="YlGnBu", fmt='.2f')
plt.title('Correlation Heatmap')
plt.show()
```



Price of Ticket for each passenger is distributed

[32]:
```
sns.catplot(x='Pclass', y='Fare', data=data, kind='bar')
```

[32]: <seaborn.axisgrid.FacetGrid at 0x28e78a06550>


80
60
40
20
0
Fare
1
2
3
Pclass

[ ]: