In [1]:
```
import pandas as pd
df = pd.read_csv('train.csv')
```

In [2]:
```
df.head()
```

Out[2]:

	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 [6]:
```
df.isna().sum()
```

Out[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
```

In [8]:
```
df.drop('Cabin',axis=1, inplace = True)
```

In [9]:
```
df
```

Out[9]:

	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
...	...	...	...	...	...	...	...	...	...	...	...
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536	13.0000	S
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0000	S
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	NaN	1	2	W./C. 6607	23.4500	S
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.0000	C
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.7500	Q

891 rows × 11 columns

In [10]:
```
df.fillna(df.mean(), inplace = True)
```

```
C:\Users\rachi\AppData\Local\Temp\ipykernel_9444\2622515659.py:1: FutureWarning: The default value of numeric_only in DataFrame.mean is deprecated. In a future version, it will default to False. In addition, specifying 'numeric_only=None' is deprecated. Select only valid columns or specify the value of numeric_only to silence this warning.
  df.fillna(df.mean(), inplace = True)
```

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

Out[14]:
```
PassengerId    0
Survived       0
Pclass         0
Name           0
Sex            0
Age            0
SibSp          0
Parch          0
Ticket         0
Fare           0
Embarked       2
dtype: int64
```

In [17]:
```
df.dropna(inplace=True)
```

In [19]:
```
df.isna().sum()
```

Out[19]:
```
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 [20]:
```
# Value counts
print(df['Sex'].value_counts())
```

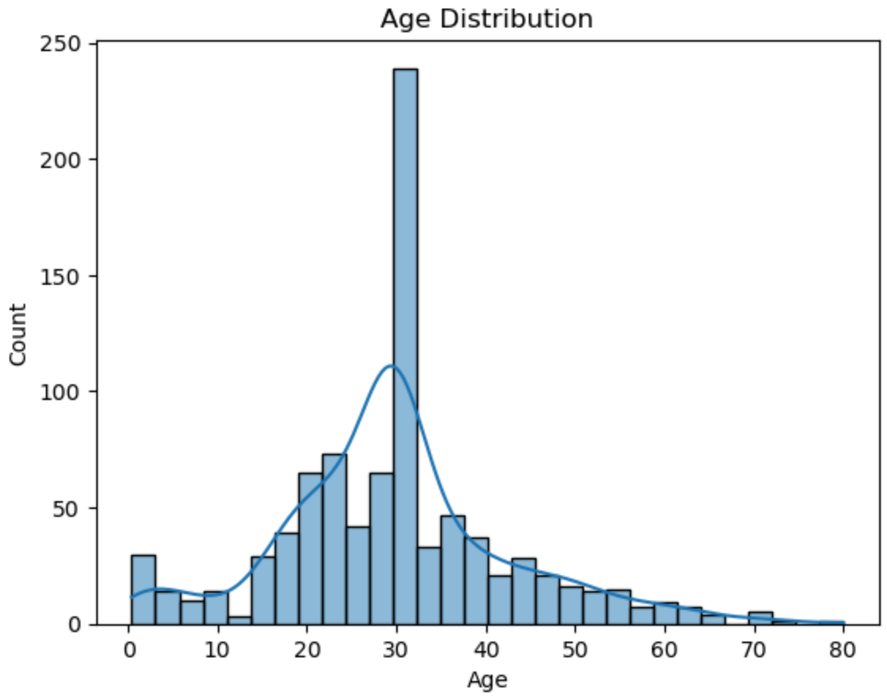
```
male      577
female    312
Name: Sex, dtype: int64
```

In [21]:
```
print(df['Embarked'].value_counts())
```

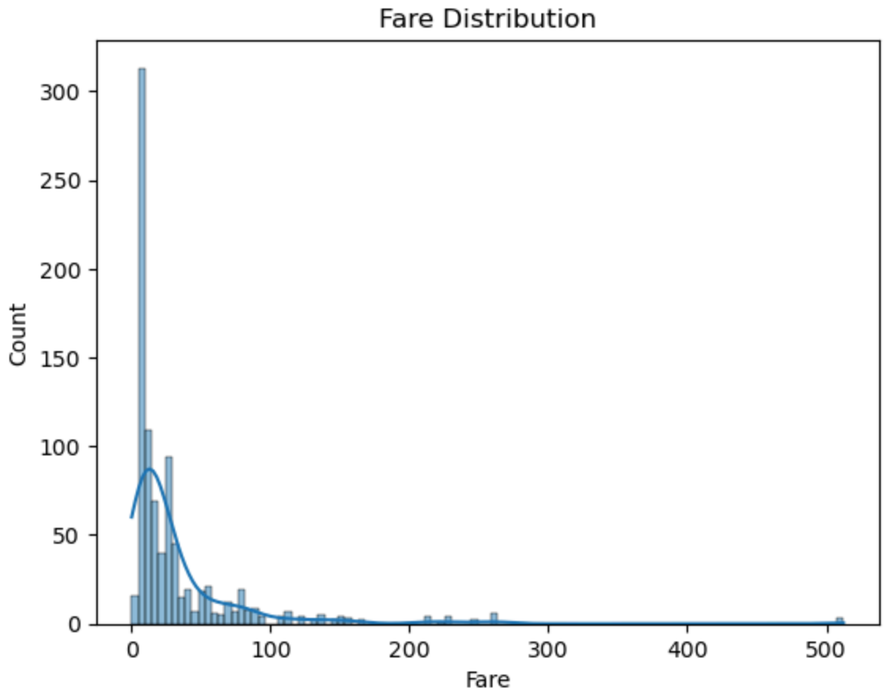
```
S    644
C    168
Q     77
Name: Embarked, dtype: int64
```

In [22]:
```
import seaborn as sns
import matplotlib.pyplot as plt
```

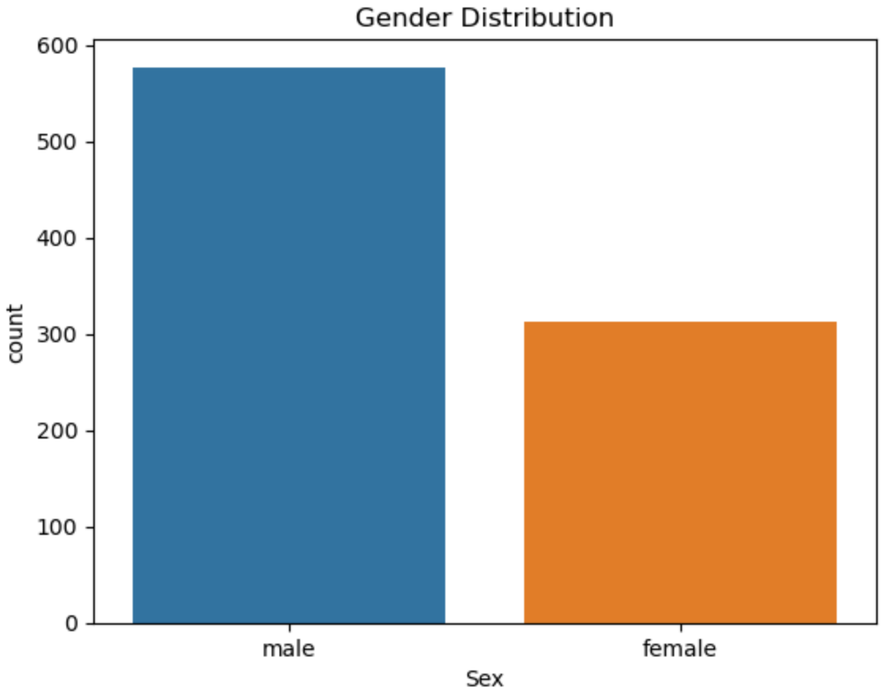
In [23]:
```
# Age distribution
sns.histplot(df['Age'], kde=True)
plt.title('Age Distribution')
plt.show()
```



In [24]:
```
# Fare distribution
sns.histplot(df['Fare'], kde=True)
plt.title('Fare Distribution')
plt.show()
```



In [26]:
```
# Count plot - Gender
sns.countplot(x='Sex', data=df)
plt.title('Gender Distribution')
plt.show()
```

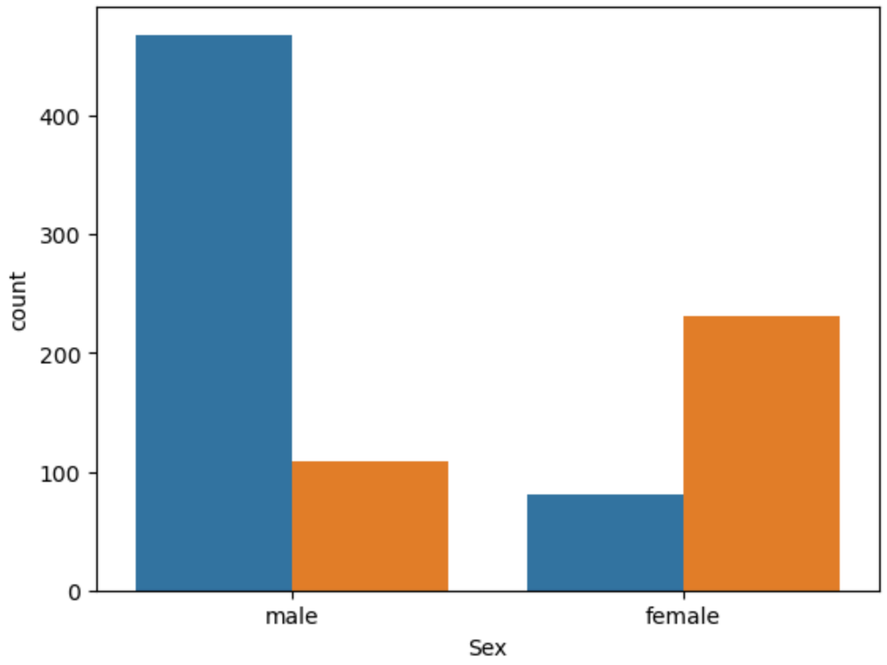


- Most of the passengers were between 20 -40 years of age
- Approx. 70% passengers were male and 30% female

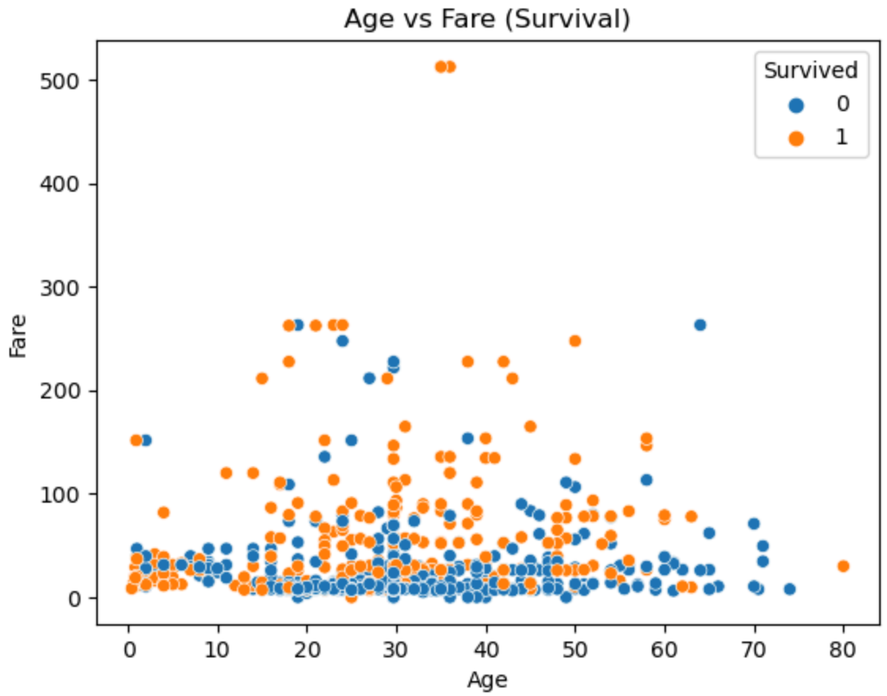
In [29]:
```
# Survival by Gender
sns.countplot(x='Sex', hue='Survived', data=df)
plt.title('Survival Count by Gender')
plt.show()
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
Cell In[29], line 2
      1 # Survival by Gender
----> 2 sns.countplot(x='Sex', hue='Survived', data=df)
      3 plt.title('Survival Count by Gender')
      4 plt.show()

File ~\anaconda3\Lib\site-packages\seaborn\categorical.py:2955, in countplot(data, x, y, hue, order, hue_order, orient, color, palette, saturation, width, dodge, ax, **kwargs)
   2952 if ax is None:
   2953     ax = plt.gca()
-> 2955 plotter.plot(ax, kwargs)
   2956 return ax

File ~\anaconda3\Lib\site-packages\seaborn\categorical.py:1587, in _BarPlotter.plot(self, ax, bar_kws)
   1585 """Make the plot."""
   1586 self.draw_bars(ax, bar_kws)
-> 1587 self.annotate_axes(ax)
   1588 if self.orient == "h":
   1589     ax.invert_yaxis()

File ~\anaconda3\Lib\site-packages\seaborn\categorical.py:767, in _CategoricalPlotter.annotate_axes(self, ax)
    764     ax.set_ylim(-.5, len(self.plot_data) - .5, auto=None)
    766 if self.hue_names is not None:
--> 767     ax.legend(loc="best", title=self.hue_title)

File ~\anaconda3\Lib\site-packages\matplotlib\axes\_axes.py:322, in Axes.legend(self, *args, **kwargs)
    204 @_docstring.dedent_interpd
    205 def legend(self, *args, **kwargs):
    206     """
    207     Place a legend on the Axes.
    208
   (...)
    320     .. plot:: gallery/text_labels_and_annotations/legend.py
    321     """
--> 322     handles, labels, kwargs = mlegend._parse_legend_args([self], *args, **kwargs)
    323     self.legend_ = mlegend.Legend(self, handles, labels, **kwargs)
    324     self.legend_._remove_method = self._remove_legend

File ~\anaconda3\Lib\site-packages\matplotlib\legend.py:1361, in _parse_legend_args(axs, handles, labels, *args, **kwargs)
   1357     handles = [handle for handle, label
   1358                in zip(_get_legend_handles(axs, handlers), labels)]
   1360 elif len(args) == 0:  # 0 args: automatically detect labels and handles.
-> 1361     handles, labels = _get_legend_handles_labels(axs, handlers)
   1362     if not handles:
   1363         log.warning(
   1364             "No artists with labels found to put in legend.  Note that "
   1365             "artists whose label start with an underscore are ignored "
   1366             "when legend() is called with no argument.")

File ~\anaconda3\Lib\site-packages\matplotlib\legend.py:1291, in _get_legend_handles_labels(axs, legend_handler_map)
   1289 for handle in _get_legend_handles(axs, legend_handler_map):
   1290     label = handle.get_label()
-> 1291     if label and not label.startswith('_'):
   1292         handles.append(handle)
   1293         labels.append(label)
```

```
AttributeError: 'numpy.int64' object has no attribute 'startswith'
```



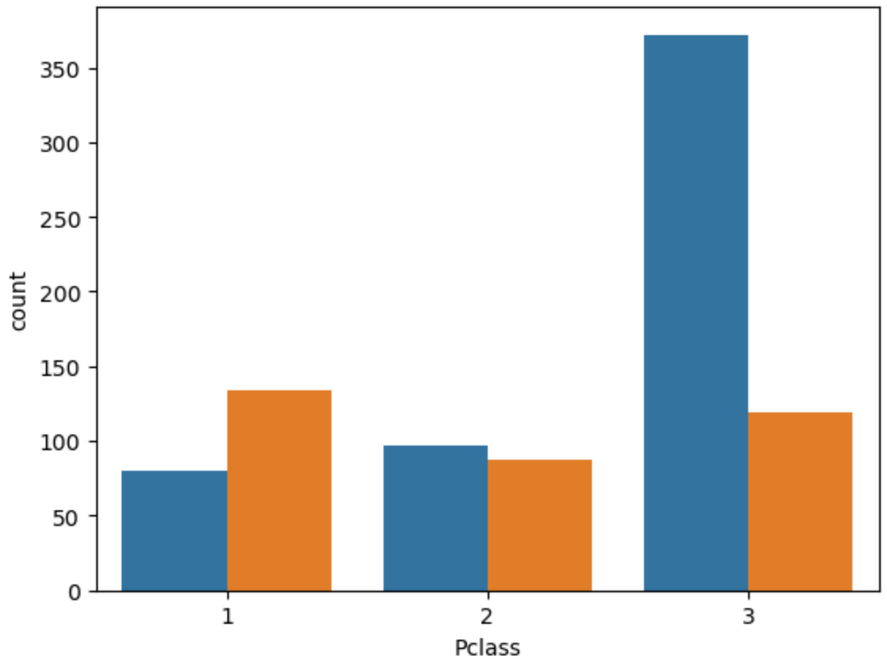
In [30]:
```
# Scatterplot: Age vs Fare colored by Survived
sns.scatterplot(x='Age', y='Fare', hue='Survived', data=df)
plt.title('Age vs Fare (Survival)')
plt.show()
```



In [31]:
```
    # Survival by Pclass
sns.countplot(x='Pclass', hue='Survived', data=df)
plt.title('Survival Count by Passenger Class')
plt.show()
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
Cell In[31], line 2
      1 # Survival by Pclass
----> 2 sns.countplot(x='Pclass', hue='Survived', data=df)
      3 plt.title('Survival Count by Passenger Class')
      4 plt.show()

File ~\anaconda3\Lib\site-packages\seaborn\categorical.py:2955, in countplot(data, x, y, hue, order, hue_order, orient, color, palette, saturation, width, dodge, ax, **kwargs)
   2952 if ax is None:
   2953     ax = plt.gca()
-> 2955 plotter.plot(ax, kwargs)
   2956 return ax

File ~\anaconda3\Lib\site-packages\seaborn\categorical.py:1587, in _BarPlotter.plot(self, ax, bar_kws)
   1585 """Make the plot."""
   1586 self.draw_bars(ax, bar_kws)
-> 1587 self.annotate_axes(ax)
   1588 if self.orient == "h":
   1589     ax.invert_yaxis()

File ~\anaconda3\Lib\site-packages\seaborn\categorical.py:767, in _CategoricalPlotter.annotate_axes(self, ax)
    764     ax.set_ylim(-.5, len(self.plot_data) - .5, auto=None)
    766 if self.hue_names is not None:
--> 767     ax.legend(loc="best", title=self.hue_title)

File ~\anaconda3\Lib\site-packages\matplotlib\axes\_axes.py:322, in Axes.legend(self, *args, **kwargs)
    204 @_docstring.dedent_interpd
    205 def legend(self, *args, **kwargs):
    206     """
    207     Place a legend on the Axes.
    208
   (...)
    320     .. plot:: gallery/text_labels_and_annotations/legend.py
    321     """
--> 322     handles, labels, kwargs = mlegend._parse_legend_args([self], *args, **kwargs)
    323     self.legend_ = mlegend.Legend(self, handles, labels, **kwargs)
    324     self.legend_._remove_method = self._remove_legend

File ~\anaconda3\Lib\site-packages\matplotlib\legend.py:1361, in _parse_legend_args(axs, handles, labels, *args, **kwargs)
   1357     handles = [handle for handle, label
   1358                in zip(_get_legend_handles(axs, handlers), labels)]
   1360 elif len(args) == 0:  # 0 args: automatically detect labels and handles.
-> 1361     handles, labels = _get_legend_handles_labels(axs, handlers)
   1362     if not handles:
   1363         log.warning(
   1364             "No artists with labels found to put in legend.  Note that "
   1365             "artists whose label start with an underscore are ignored "
   1366             "when legend() is called with no argument.")

File ~\anaconda3\Lib\site-packages\matplotlib\legend.py:1291, in _get_legend_handles_labels(axs, legend_handler_map)
   1289 for handle in _get_legend_handles(axs, legend_handler_map):
   1290     label = handle.get_label()
-> 1291     if label and not label.startswith('_'):
   1292         handles.append(handle)
   1293         labels.append(label)
```

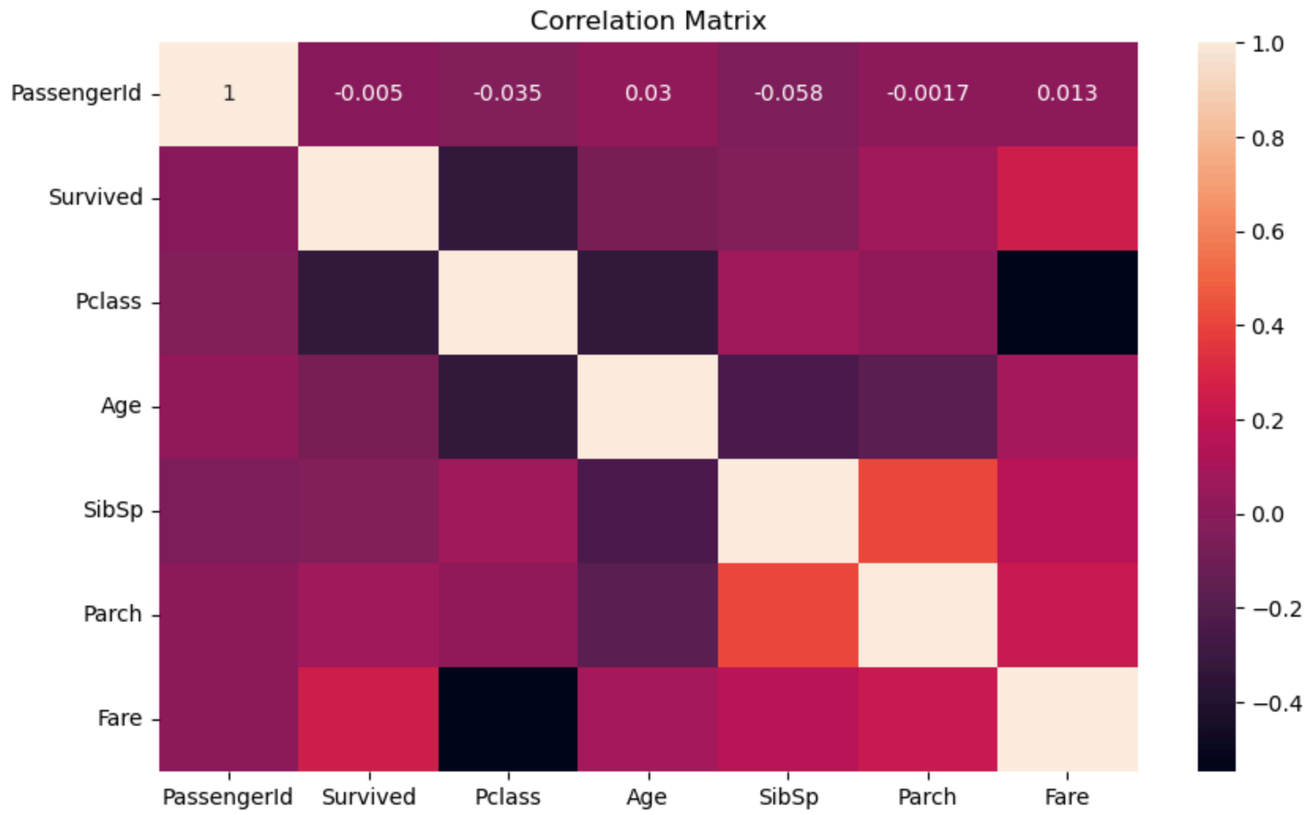
```
AttributeError: 'numpy.int64' object has no attribute 'startswith'
```



- 3rd class passangers had higher surviving rate
- Survivors mostly paid higher fares

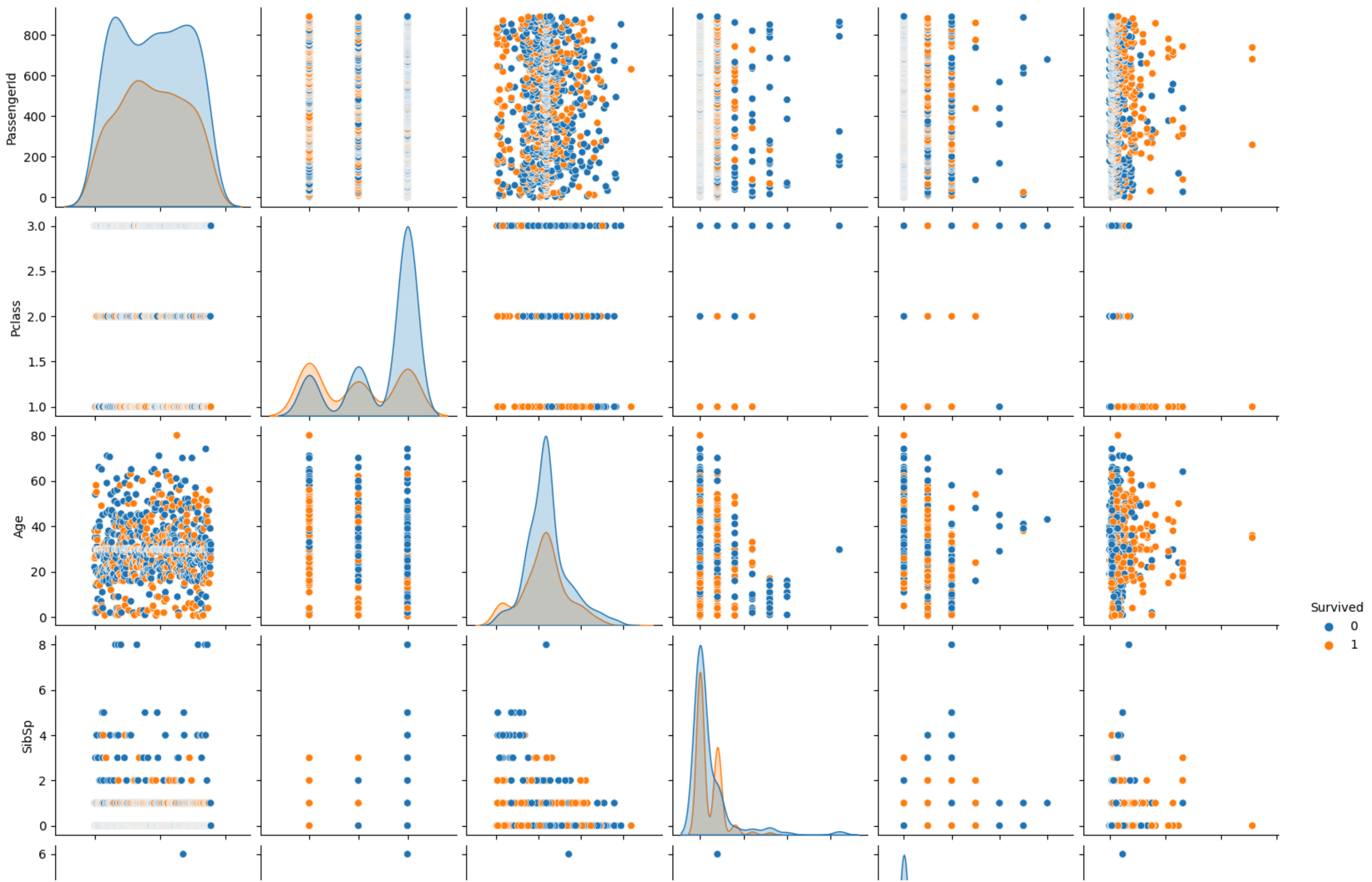
In [33]:
```
# Correlation heatmap
plt.figure(figsize=(10,6))
sns.heatmap(df.corr(), annot=True)
plt.title('Correlation Matrix')
plt.show()
```

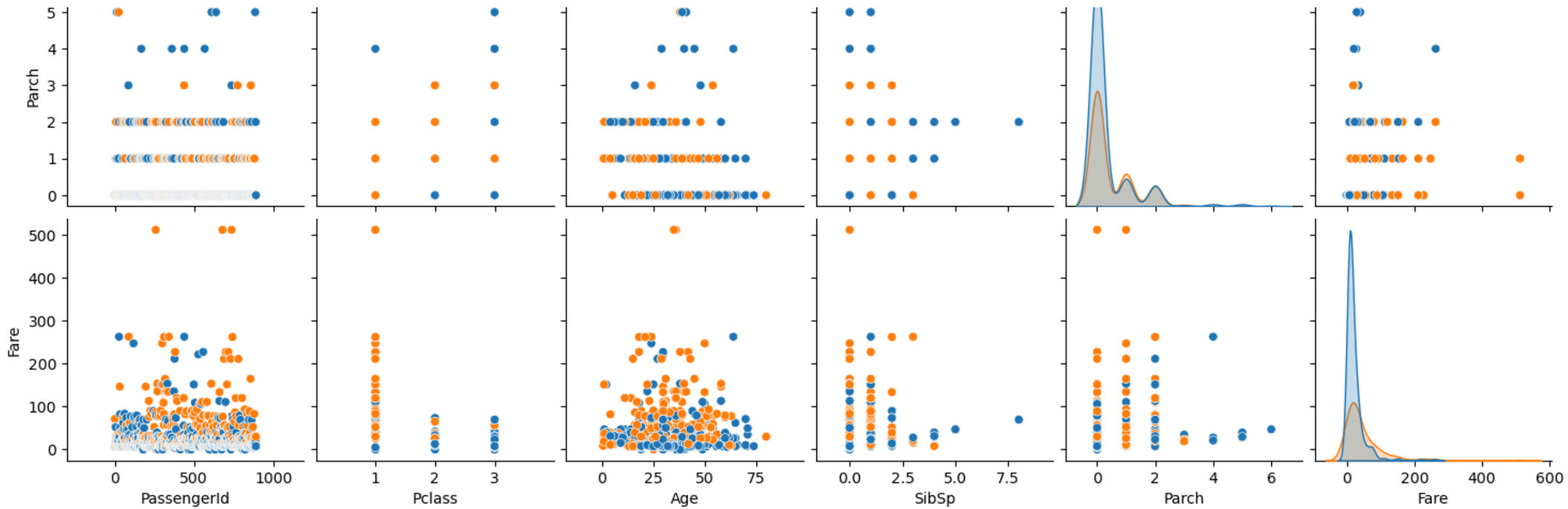
```
C:\Users\rachi\AppData\Local\Temp\ipykernel_9444\1756671663.py:3: FutureWarning: The default value of numeric_only in DataFrame.corr is deprecated. In a future version, it will default to False. Sel
ect only valid columns or specify the value of numeric_only to silence this warning.
  sns.heatmap(df.corr(), annot=True)
```



In [34]:
```
# Pairplot
sns.pairplot(df, hue='Survived')
plt.suptitle('Pairplot of Features', y=1.02)
plt.show()
```

Pairplot of Features





In [ ]: