Exploratory Data Analysis (EDA) on Titanic Dataset

This notebook aims to extract insights using visual and statistical exploration.

Objective

Extract insights using visual and statistical exploration.

```
# Step 1: Import Required Libraries
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
sns.set(style='whitegrid')

# Step 2: Load Dataset
df =
pd.read_csv('https://raw.githubusercontent.com/datasciencedojo/dataset
s/master/titanic.csv')
df.head()
```

```
   PassengerId  Survived  Pclass  \
0            1         0       3
1            2         1       1
2            3         1       3
3            4         1       1
4            5         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

   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
```

```python
# Step 3: Basic Exploration
df.describe()
```

```
       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
```

```python
# Step 4: Info and Null Values
df.info()
df.isnull().sum()
```

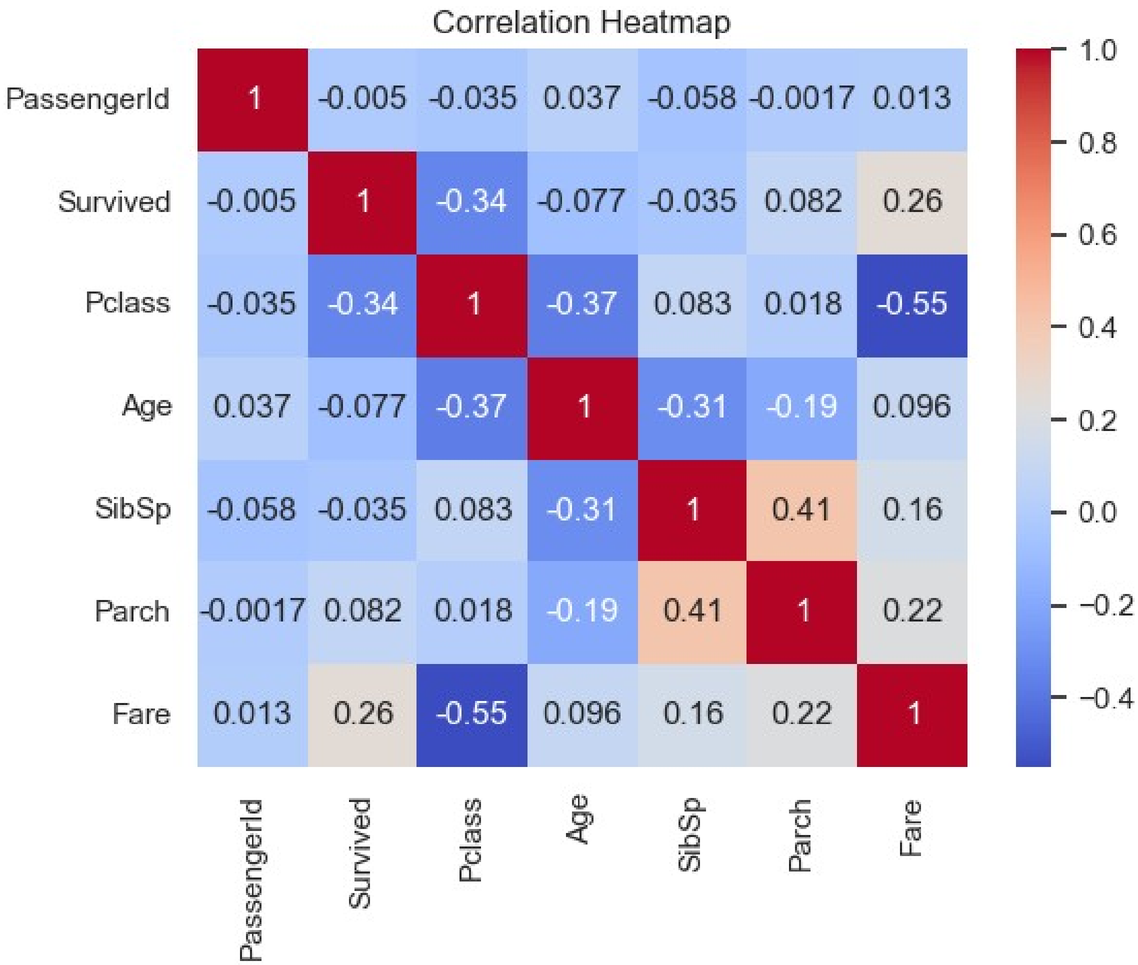
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 12 columns):
 #   Column       Non-Null Count  Dtype
---  ------       --------------  -----
 0   PassengerId  891 non-null    int64
 1   Survived     891 non-null    int64
 2   Pclass       891 non-null    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
```

```
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
```

```python
# Step 5: Value Counts
df['Sex'].value_counts()
```

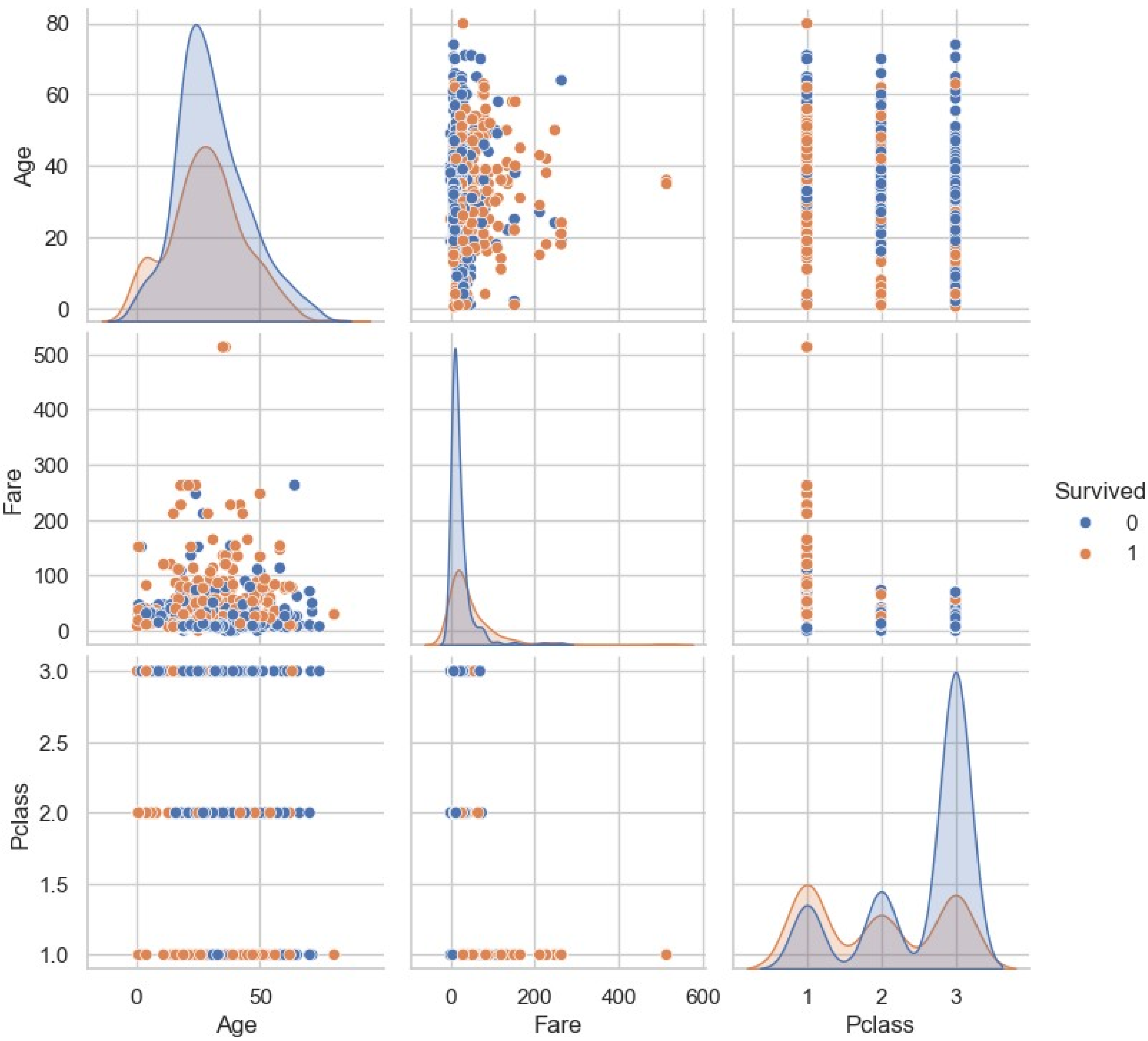
```
Sex
male      577
female    314
Name: count, dtype: int64
```

```python
# Step 6: Correlation and Heatmap
corr = df.corr(numeric_only=True)
sns.heatmap(corr, annot=True, cmap='coolwarm')
plt.title('Correlation Heatmap')
plt.show()
```



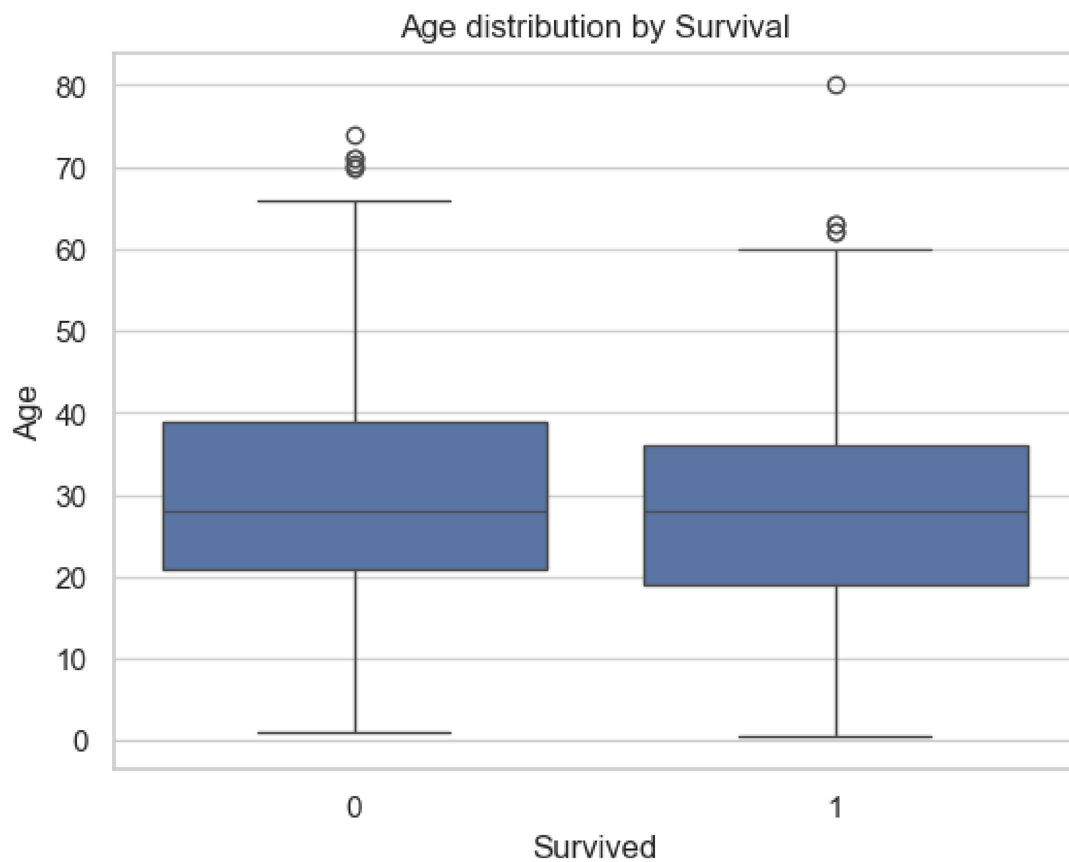

```
# Step 7: Pairplot
sns.pairplot(df[['Survived', 'Age', 'Fare', 'Pclass']],
hue='Survived')

<seaborn.axisgrid.PairGrid at 0x1c7fba96c30>
```




```
# Step 8: Boxplot
sns.boxplot(x='Survived', y='Age', data=df)
plt.title('Age distribution by Survival')
```

```
Text(0.5, 1.0, 'Age distribution by Survival')
```



Summary of Findings

- Females had higher survival rates than males.
- Younger passengers had slightly better survival odds.
- Higher class passengers had a higher survival rate.
- Fare paid positively correlates with survival.