Titanic Dataset - Exploratory Data Analysis (EDA)

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

# Load the dataset
from google.colab import files
uploaded = files.upload()

df = pd.read_csv('train.csv')
df.head()
```

Choose files train.csv

- **train.csv**(text/csv) - 61194 bytes, last modified: 11/12/2019 - 100% done

```
Saving train.csv to train (1).csv
```

	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

Next steps: Generate code with df View recommended plots New interactive sheet

```
# Basic Info
df.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
```

```
# Summary Statistics
df.describe(include='all')
```

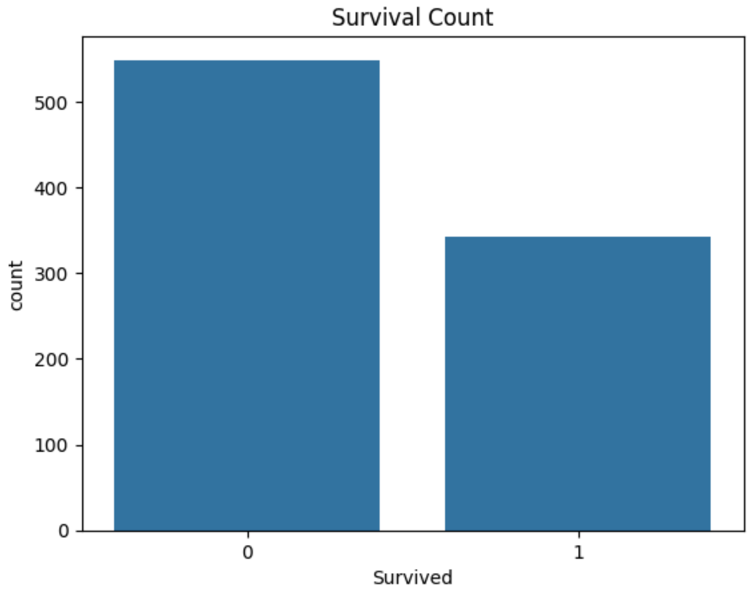
	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
count	891.000000	891.000000	891.000000	891	891	714.000000	891.000000	891.000000	891	891.000000	204	889
unique	NaN	NaN	NaN	891	2	NaN	NaN	NaN	681	NaN	147	3
top	NaN	NaN	NaN	Dooley, Mr. Patrick	male	NaN	NaN	NaN	347082	NaN	G6	S
freq	NaN	NaN	NaN	1	577	NaN	NaN	NaN	7	NaN	4	644
mean	446.000000	0.383838	2.308642	NaN	NaN	29.699118	0.523008	0.381594	NaN	32.204208	NaN	NaN
std	257.353842	0.486592	0.836071	NaN	NaN	14.526497	1.102743	0.806057	NaN	49.693429	NaN	NaN
min	1.000000	0.000000	1.000000	NaN	NaN	0.420000	0.000000	0.000000	NaN	0.000000	NaN	NaN
25%	223.500000	0.000000	2.000000	NaN	NaN	20.125000	0.000000	0.000000	NaN	7.910400	NaN	NaN
50%	446.000000	0.000000	3.000000	NaN	NaN	28.000000	0.000000	0.000000	NaN	14.454200	NaN	NaN
75%	668.500000	1.000000	3.000000	NaN	NaN	38.000000	1.000000	0.000000	NaN	31.000000	NaN	NaN

```
# Check missing values
df.isnull().sum()
```

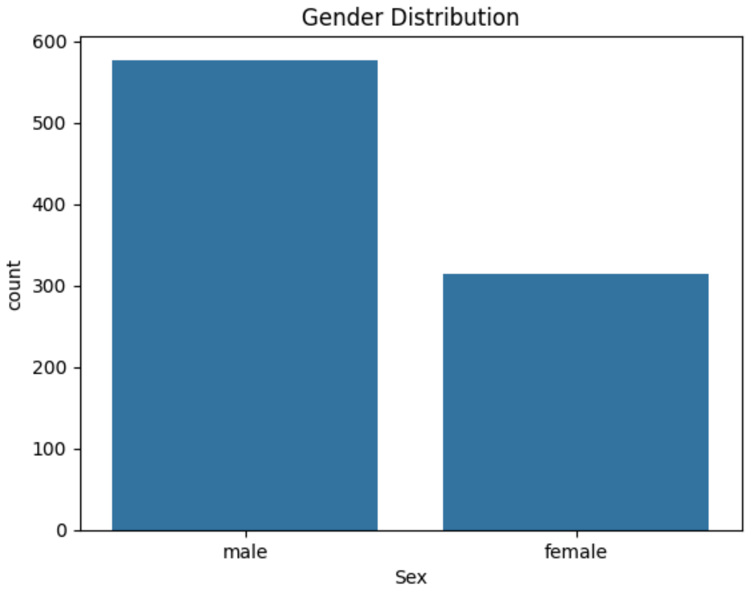
	0
PassengerId	0
Survived	0
Pclass	0
Name	0
Sex	0
Age	177
SibSp	0
Parch	0
Ticket	0
Fare	0
Cabin	687
Embarked	2

dtype: int64

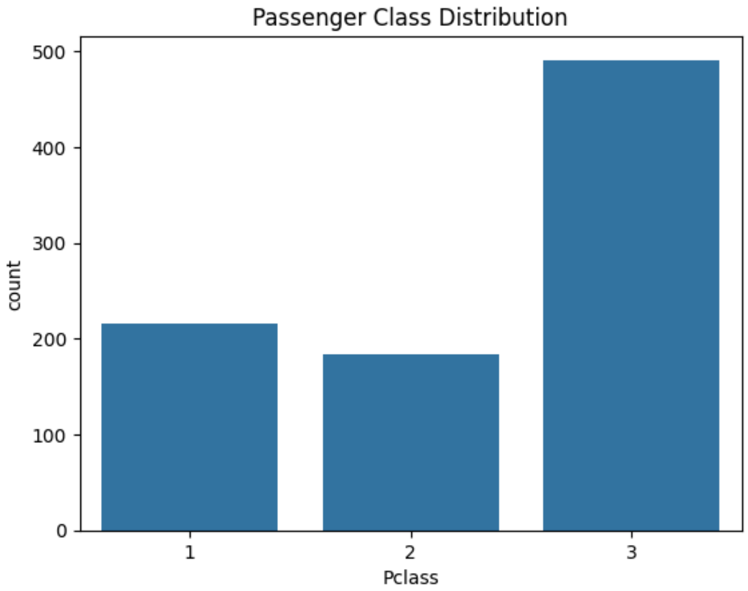
```
# Univariate Analysis - Survival Count
sns.countplot(x='Survived', data=df)
plt.title('Survival Count')
plt.show()
```



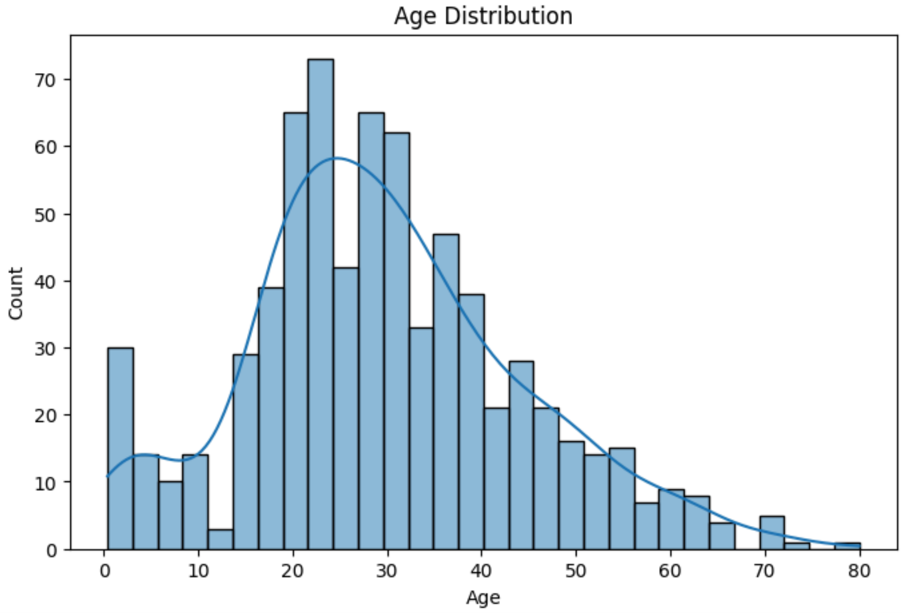
```
# Gender Distribution
sns.countplot(x='Sex', data=df)
plt.title('Gender Distribution')
plt.show()
```



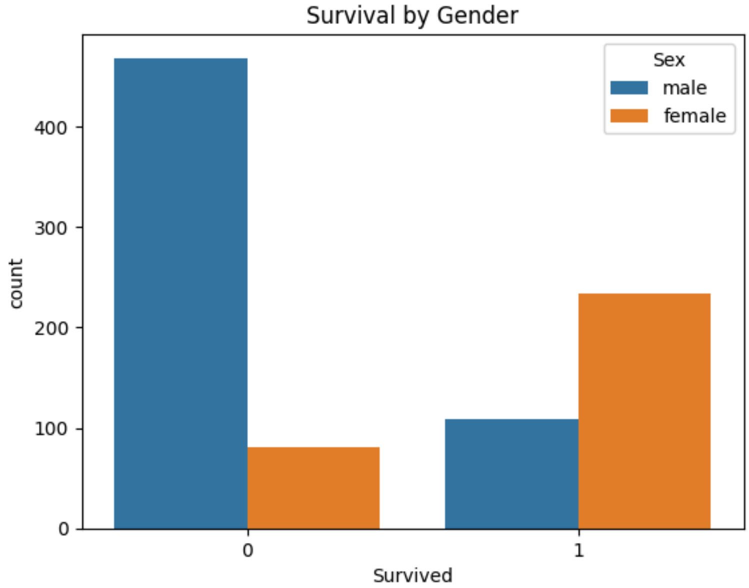
```
# Pclass Distribution
sns.countplot(x='Pclass', data=df)
plt.title('Passenger Class Distribution')
plt.show()
```



```
# Age Distribution
plt.figure(figsize=(8,5))
sns.histplot(df['Age'].dropna(), kde=True, bins=30)
plt.title('Age Distribution')
plt.show()
```

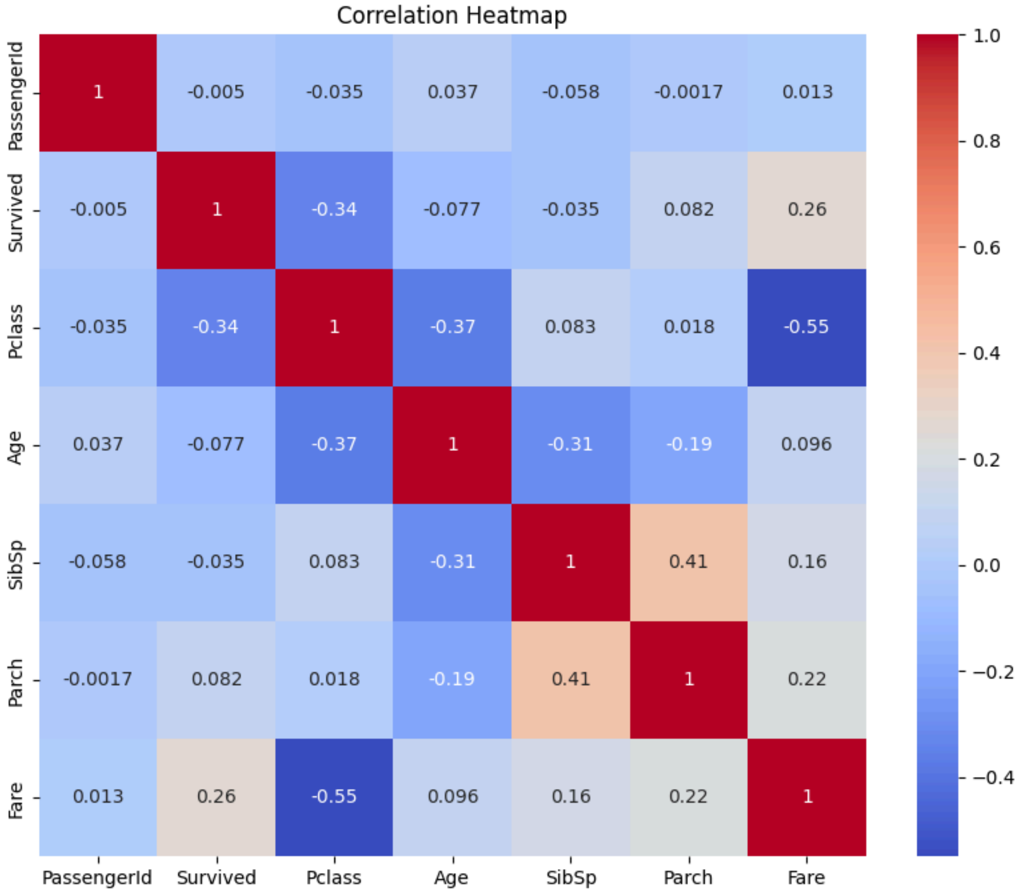


```
# Bivariate - Survival by Gender
sns.countplot(x='Survived', hue='Sex', data=df)
plt.title('Survival by Gender')
plt.show()
```



```
# Bivariate - Survival by Pclass
sns.countplot(x='Survived', hue='Pclass', data=df)
plt.title('Survival by Passenger Class')
plt.show()
```

```
# Correlation Heatmap (numerical features only)
plt.figure(figsize=(10,8))
sns.heatmap(df.select_dtypes(include=[np.number]).corr(), annot=True, cmap='coolwarm')
plt.title('Correlation Heatmap')
plt.show()
```



	PassengerId	Survived	Pclass	Age	SibSp	Parch	Fare
PassengerId	1	-0.005	-0.035	0.037	-0.058	-0.0017	0.013
Survived	-0.005	1	-0.34	-0.077	-0.035	0.082	0.26
Pclass	-0.035	-0.34	1	-0.37	0.083	0.018	-0.55
Age	0.037	-0.077	-0.37	1	-0.31	-0.19	0.096
SibSp	-0.058	-0.035	0.083	-0.31	1	0.41	0.16
Parch	-0.0017	0.082	0.018	-0.19	0.41	1	0.22
Fare	0.013	0.26	-0.55	0.096	0.16	0.22	1