```
from google.colab import files
uploaded = files.upload()
```

```
Choose Files archive (3).zip
• archive (3).zip(application/x-zip-compressed) - 22544 bytes, last modified: 6/23/2025 - 100% done
Saving archive (3).zip to archive (3).zip
```

```
import zipfile
import os

# Extract the ZIP file to a folder called 'titanic_data'
with zipfile.ZipFile("archive (3).zip", 'r') as zip_ref:
    zip_ref.extractall("titanic_data")

# List the extracted files
print("Extracted Files:")
print(os.listdir("titanic_data"))
```

```
Extracted Files:
['train.csv']
```

```
import pandas as pd

df = pd.read_csv("titanic_data/train.csv")
df.head()
```

	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

Generate Using dataframe: df suggest a plot Close

```
# Shape and data types
print("Shape:", df.shape)
print("\nData Types:\n", df.dtypes)

# Summary info
df.info()

# Statistical summary
df.describe(include='all')
```

What can I help you build?

```
Shape: (891, 12)

Data Types:
 PassengerId      int64
Survived         int64
Pclass           int64
Name            object
Sex             object
Age            float64
SibSp            int64
Parch            int64
Ticket          object
Fare           float64
Cabin           object
Embarked        object
dtype: object
<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
```

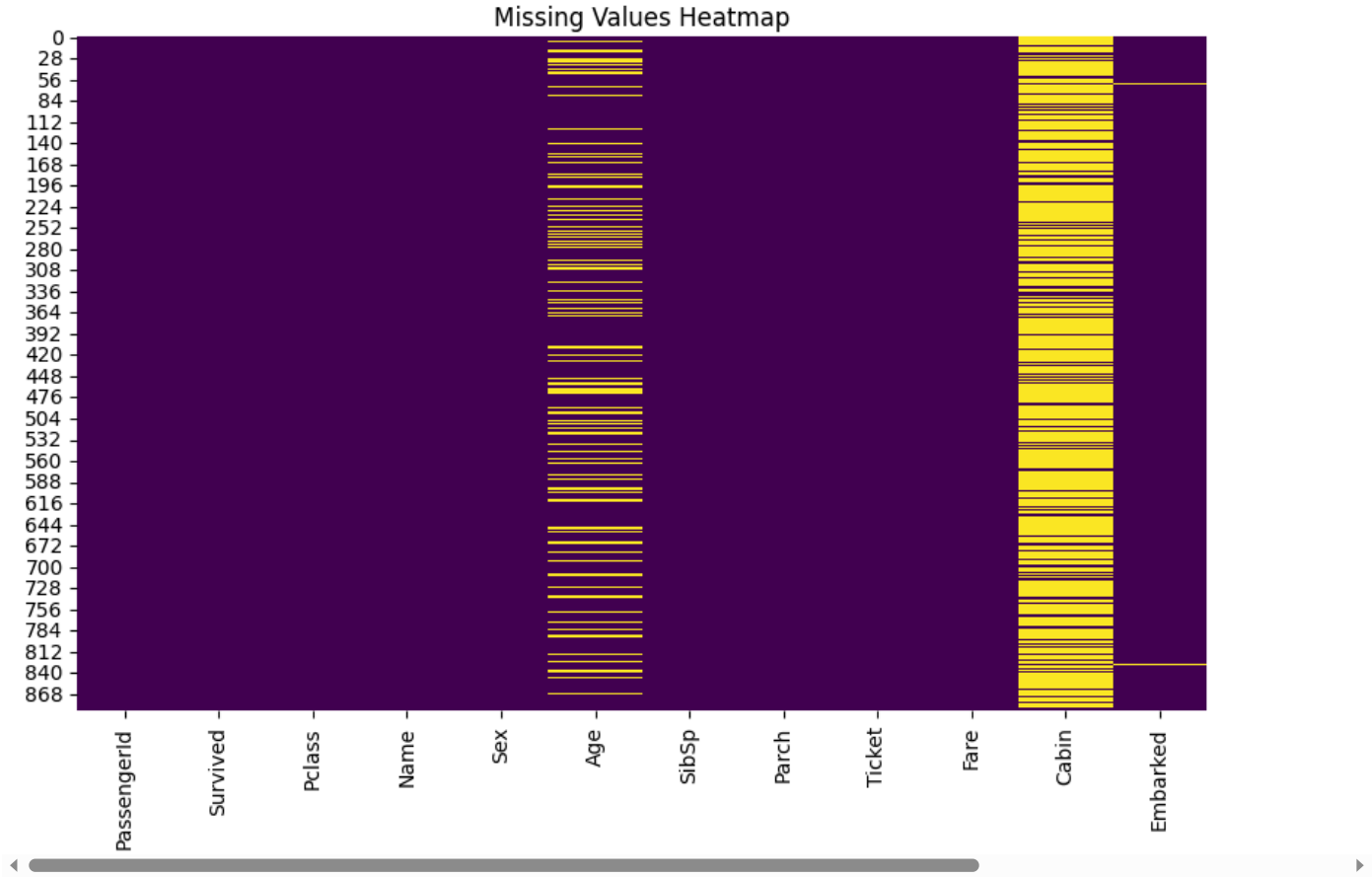
	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Emb
count	891.000000	891.000000	891.000000	891	891	714.000000	891.000000	891.000000	891	891.000000	204	
unique	NaN	NaN	NaN	891	2	NaN	NaN	NaN	681	NaN	147	

Deploy

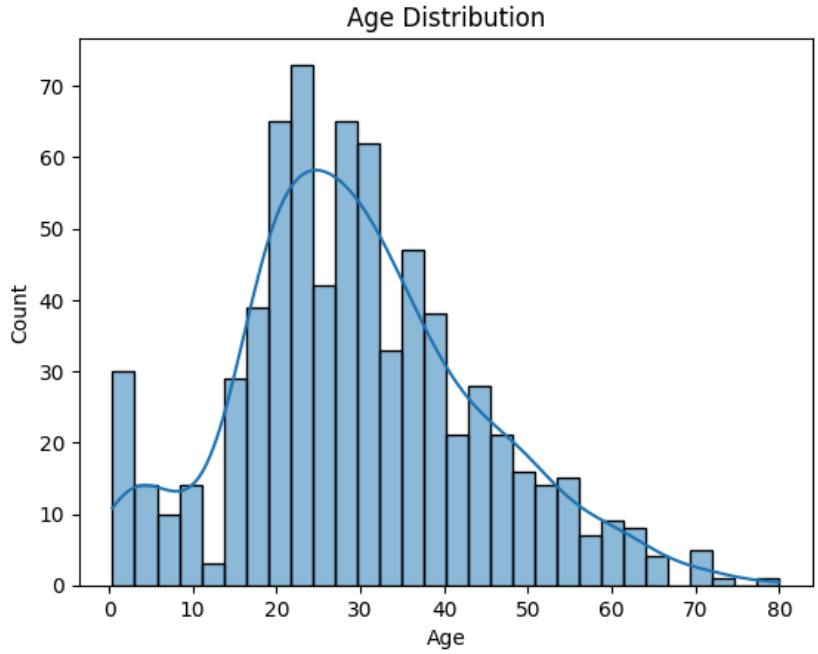
```
# Check total missing values
print("Missing Values:\n", df.isnull().sum())

# Visualize missing values with heatmap
import seaborn as sns
import matplotlib.pyplot as plt

plt.figure(figsize=(10,6))
sns.heatmap(df.isnull(), cbar=False, cmap='viridis')
plt.title("Missing Values Heatmap")
plt.show()
```

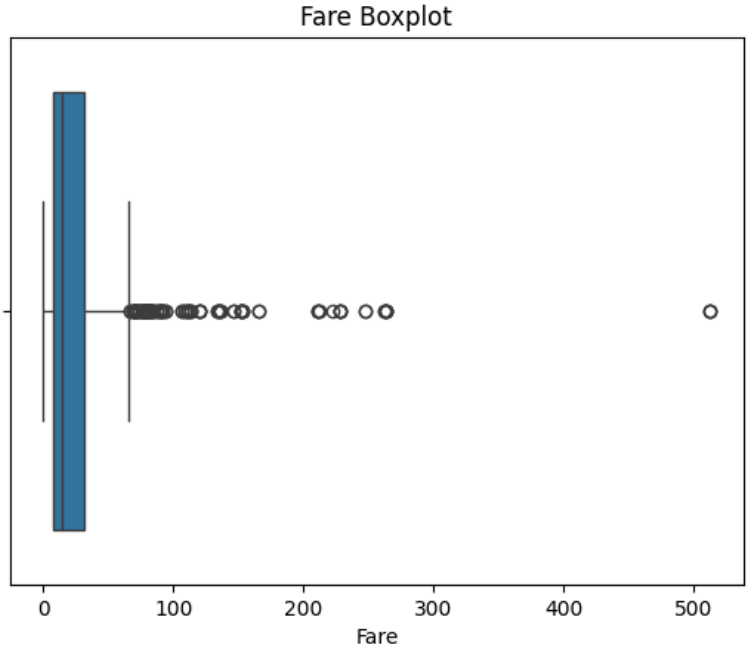
75%	668.500000	1.000000	3.000000	NaN	NaN	38.000000	1.000000	0.000000	NaN	31.000000	NaN

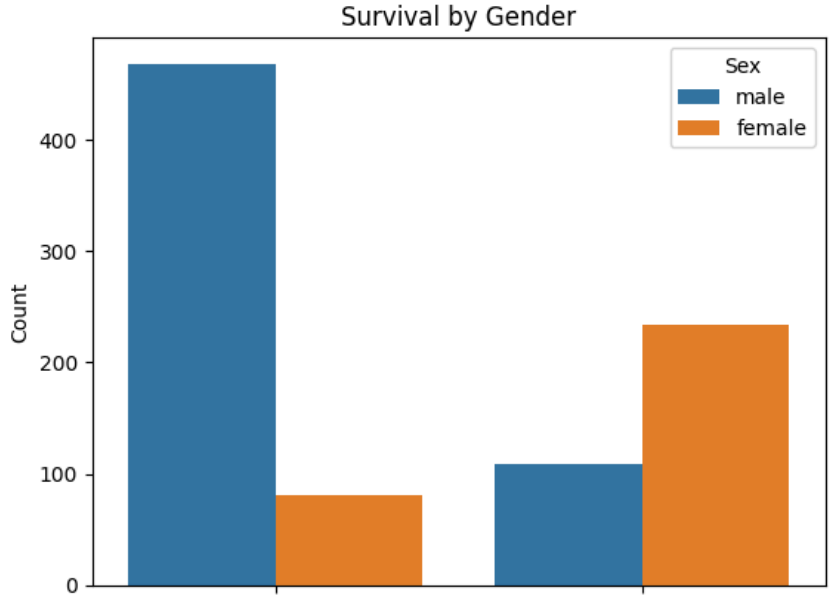
```
Missing Values:
 PassengerId      0
Survived          0
Pclass            0
Name              0
Sex               0
Age             177
SibSp             0
Parch             0
Ticket            0
Fare              0
Cabin           687
Embarked          2
dtype: int64
```




```
# Age distribution
sns.histplot(df['Age'].dropna(), kde=True, bins=30)
plt.title("Age Distribution")
plt.xlabel("Age")
plt.ylabel("Count")
plt.show()

# Fare boxplot to check for outliers
sns.boxplot(x=df['Fare'])
plt.title("Fare Boxplot")
plt.xlabel("Fare")
plt.show()

# Survival count by gender
sns.countplot(x='Survived', hue='Sex', data=df)
plt.title("Survival by Gender")
plt.xlabel("Survived (0 = No, 1 = Yes)")
plt.ylabel("Count")
plt.legend(title="Sex")
plt.show()
```


Age Distribution
Count
Age
0
10
20
30
40
50
60
70
80

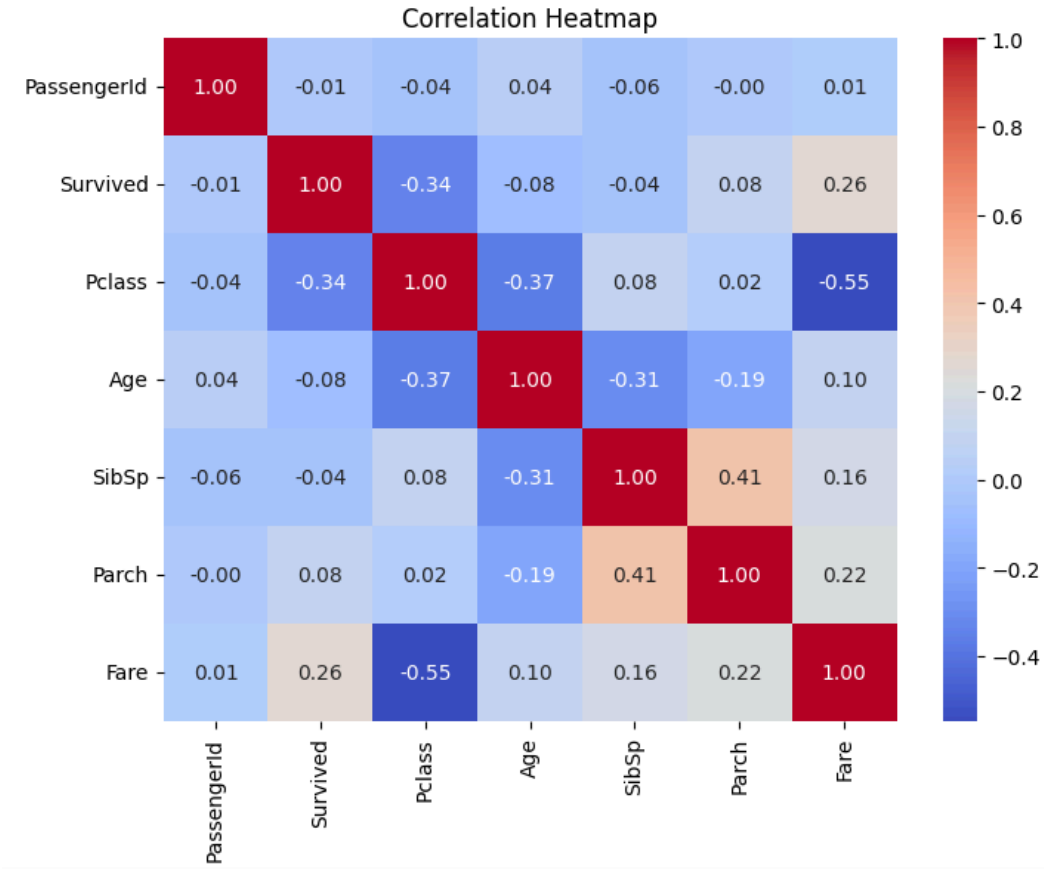

Fare Boxplot
Fare
0
100
200
300
400
500


Survival by Gender
Sex
male
female
Count
0
100
200
300
400

0 1

Survived (0 = No, 1 = Yes)

```
# Correlation matrix (numerical columns only)
corr = df.corr(numeric_only=True)

# Heatmap
plt.figure(figsize=(8,6))
sns.heatmap(corr, annot=True, cmap='coolwarm', fmt='.2f')
plt.title("Correlation Heatmap")
plt.show()
```




```
# 1. Fill missing Age with median
df['Age'].fillna(df['Age'].median(), inplace=True)

# 2. Fill missing Embarked with mode
df['Embarked'].fillna(df['Embarked'].mode()[0], inplace=True)

# 3. Fill missing Cabin with "Unknown"
df['Cabin'].fillna("Unknown", inplace=True)

# ✅ Recheck missing values
print("Remaining Missing Values:\n", df.isnull().sum())
```

```
Remaining Missing Values:
 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
/tmp/ipython-input-8-2482308467.py:2: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series throug
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we ar

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col


  df['Age'].fillna(df['Age'].median(), inplace=True)
/tmp/ipython-input-8-2482308467.py:5: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series throug
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we ar

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col


  df['Embarked'].fillna(df['Embarked'].mode()[0], inplace=True)
/tmp/ipython-input-8-2482308467.py:8: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series throug
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we ar

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col


  df['Cabin'].fillna("Unknown", inplace=True)
```

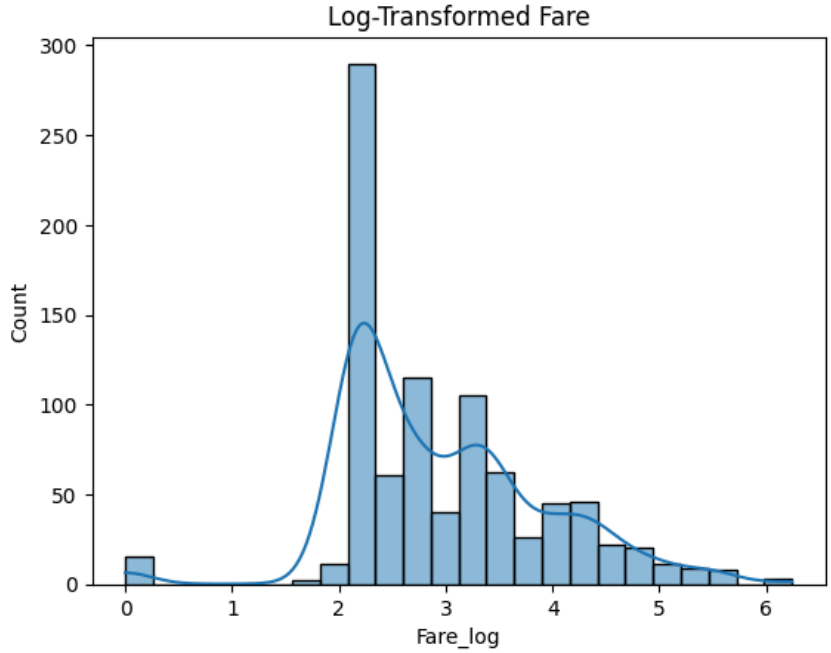
```
# Survival rate by Passenger Class
print("Survival Rate by Pclass:\n", df.groupby('Pclass')['Survived'].mean(), "\n")

# Survival rate by Gender
print("Survival Rate by Sex:\n", df.groupby('Sex')['Survived'].mean(), "\n")

# Survival rate by Embarked
print("Survival Rate by Embarked:\n", df.groupby('Embarked')['Survived'].mean(), "\n")

# Average Fare by Class
print("Average Fare by Pclass:\n", df.groupby('Pclass')['Fare'].mean(), "\n")

# Average Age by Class
print("Average Age by Pclass:\n", df.groupby('Pclass')['Age'].mean())
```

```
Survival Rate by Pclass:
 Pclass
1    0.629630
2    0.472826
3    0.242363
Name: Survived, dtype: float64

Survival Rate by Sex:
 Sex
female    0.742038
male      0.188908
Name: Survived, dtype: float64

Survival Rate by Embarked:
 Embarked
C    0.553571
Q    0.389610
S    0.339009
Name: Survived, dtype: float64

Average Fare by Pclass:
 Pclass
1    84.154687
2    20.662183
3    13.675550
Name: Fare, dtype: float64

Average Age by Pclass:
 Pclass
1    36.812130
2    29.765380
3    25.932627
Name: Age, dtype: float64
```

```
import numpy as np
```

```
import numpy as np

# Check skewness before
print("Fare skewness (before):", df['Fare'].skew())

# Apply log transformation
df['Fare_log'] = np.log1p(df['Fare'])

# Plot after transformation
sns.histplot(df['Fare_log'], kde=True)
plt.title("Log-Transformed Fare")
plt.show()

# Check skewness after
print("Fare skewness (after):", df['Fare_log'].skew())
```

```
Fare skewness (before): 4.787316519674893
```




```
Fare skewness (after): 0.3949280095189306
```