```
import pandas as pd
df=pd.read_csv('/content/Titanic-Dataset (1).csv')
df
```

	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
...	...	...	...	...	...	...	...	...	...	...	...	...
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536	13.0000	NaN	S
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0000	B42	S

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

```
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
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	S

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

```
df.info()
df.describe()
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
```

	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

```
#Step 2: Handling Missing Values

# Impute missing values using mean for numerical columns

df['Age'].fillna(df['Age'].median(), inplace=True)
df['Fare'].fillna(df['Fare'].mean(), inplace=True)
df['Embarked'].fillna(df['Embarked'].mode()[0], inplace=True)
df
```

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


  df['Age'].fillna(df['Age'].median(), inplace=True)
<ipython-input-4-d344e75ce5e6>:6: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on w

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


  df['Fare'].fillna(df['Fare'].mean(), inplace=True)
<ipython-input-4-d344e75ce5e6>:7: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on w

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


  df['Embarked'].fillna(df['Embarked'].mode()[0], inplace=True)
```

	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
...	...	...	...	...	...	...	...	...	...	...	...	...
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536	13.0000	NaN	S
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0000	B42	S
888	889	0	3	Johnston, Miss. Catherine ...	female	28.0	1	2	W./C. 6607	23.4500	NaN	S

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

```
# 3. Encode categorical features
from sklearn.preprocessing import LabelEncoder, StandardScaler
label_enc = LabelEncoder()
df['Sex'] = label_enc.fit_transform(df['Sex'])
df['Embarked'] = label_enc.fit_transform(df['Embarked'])
df
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	1	22.0	1	0	A/5 21171	7.2500	NaN	2
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	0	38.0	1	0	PC 17599	71.2833	C85	0
2	3	1	3	Heikkinen, Miss. Laina	0	26.0	0	0	STON/O2. 3101282	7.9250	NaN	2
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	0	35.0	1	0	113803	53.1000	C123	2
4	5	0	3	Allen, Mr. William Henry	1	35.0	0	0	373450	8.0500	NaN	2
...	...	...	...	...	...	...	...	...	...	...	...	...
886	887	0	2	Montvila, Rev. Juozas	1	27.0	0	0	211536	13.0000	NaN	2
887	888	1	1	Graham, Miss. Margaret Edith	0	19.0	0	0	112053	30.0000	B42	2

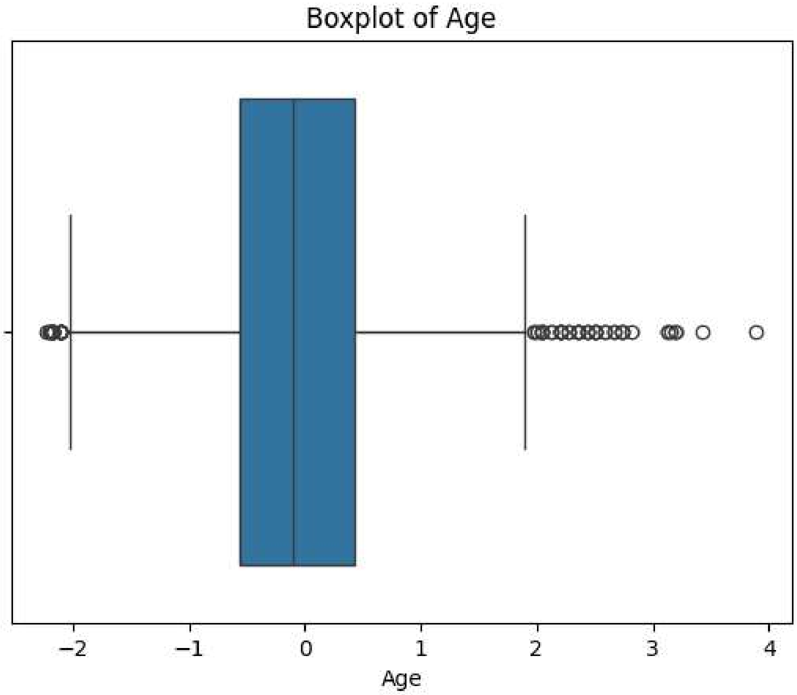
Next steps: Generate code with df View recommended plots New interactive sheet

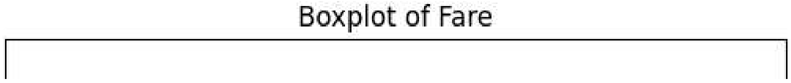
```
# 4. Normalize numerical features
scaler = StandardScaler()
df[['Age', 'Fare']] = scaler.fit_transform(df[['Age', 'Fare']])
df
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	1	-0.565736	1	0	A/5 21171	-0.502445	NaN	2
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	0	0.663861	1	0	PC 17599	0.786845	C85	0
2	3	1	3	Heikkinen, Miss. Laina	0	-0.258337	0	0	STON/O2. 3101282	-0.488854	NaN	2
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	0	0.433312	1	0	113803	0.420730	C123	2
4	5	0	3	Allen, Mr. William Henry	1	0.433312	0	0	373450	-0.486337	NaN	2
...	...	...	...	...	...	...	...	...	...	...	...	...
886	887	0	2	Montvila, Rev. Juozas	1	-0.181487	0	0	211536	-0.386671	NaN	2
887	888	1	1	Graham, Miss. Margaret Edith	0	-0.796286	0	0	112053	-0.044381	B42	2

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

```
# 5. Visualize & remove outliers using boxplots

import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt

numerical_features = ['Age', 'Fare']
for col in numerical_features:
    sns.boxplot(x=df[col])
    plt.title(f'Boxplot of {col}')
    plt.show()

# Remove outliers using IQR
for col in numerical_features:
    Q1 = df[col].quantile(0.25)
    Q3 = df[col].quantile(0.75)
    IQR = Q3 - Q1
    df = df[~((df[col] < (Q1 - 1.5 * IQR)) | (df[col] > (Q3 + 1.5 * IQR)))]

print(df.shape)
```


Boxplot of Age
−2
−1
0
1
2
3
4
Age


Boxplot of Fare