Task 1

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1.Import the dataset and explore basic info (nu ls, data types)

```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn.preprocessing import LabelEncoder, StandardScaler
```

```
data = pd.read_csv("C:/Users/JAAVANIKA L/Fall semester 22-23/Downloads/Titanic-Dataset.csv")
data.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
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	NaN	S

```
data.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
```

```
data.isnull().sum()
```

```
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
```

2.Handle missing values using mean/median/imputation.

3.Convert categorical features into numerical using encoding.

4.Normalize/standardize the numerical features.

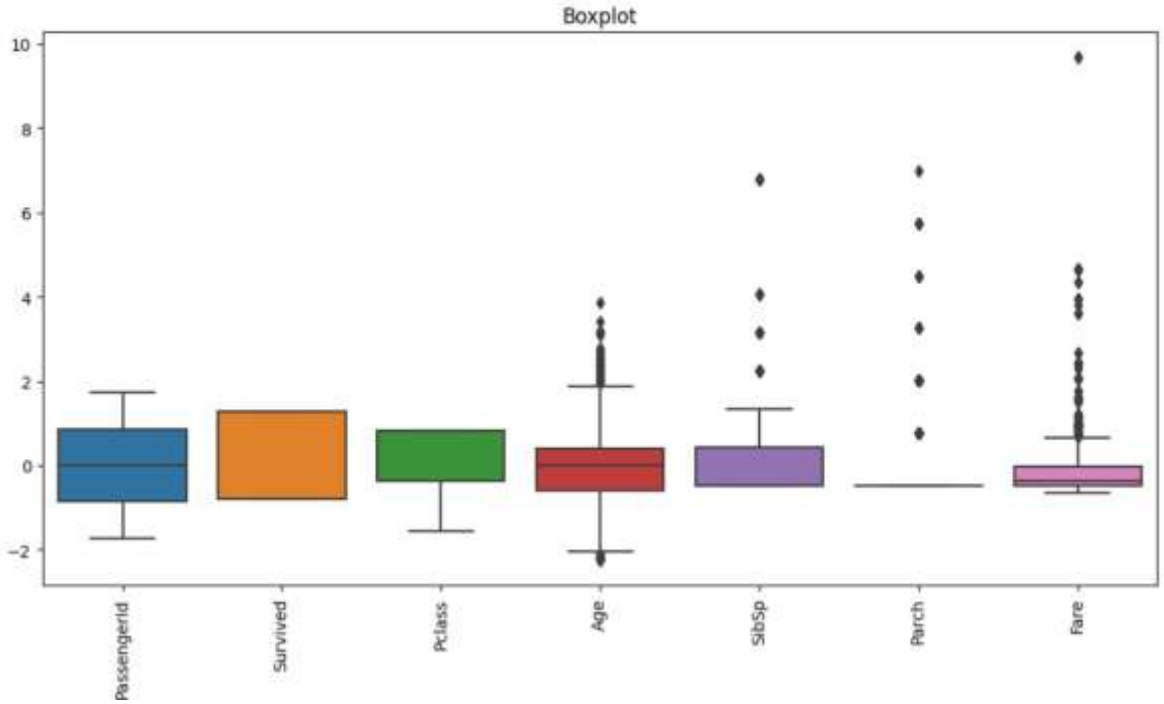
```
for column in data.columns:
    if data[column].isnull().sum() > 0:
        if data[column].dtype == 'object':
            data[column].fillna(data[column].mode()[0], inplace=True)
        else:
            data[column].fillna(data[column].mean(), inplace=True)
```

```
label_encoder = LabelEncoder()
for column in data.select_dtypes(include='object').columns:
    data[column] = label_encoder.fit_transform(data[column])
```

```
scaler = StandardScaler()
numeric_columns = data.select_dtypes(include=['int64', 'float64']).columns
data[numeric_columns] = scaler.fit_transform(data[numeric_columns])
```

5.Visualize outliers using boxplots and remove them.

```
plt.figure(figsize=(12, 6))
sns.boxplot(data=data[numeric_columns])
plt.title("Boxplot")
plt.xticks(rotation=90)
plt.show()
```



```python
for column in numeric_columns:
    Q1 = data[column].quantile(0.25)
    Q3 = data[column].quantile(0.75)
    IQR = Q3 - Q1
    lower_limit = Q1 - 1.5 * IQR
    upper_limit = Q3 + 1.5 * IQR
    data = data[(data[column] >= lower_limit) & (data[column] <= upper_limit)]
```

```python
print("\nShape of dataset after removing outliers:", data.shape)
```

```
Shape of dataset after removing outliers: (561, 12)
```