Future Intern as Data Analysis

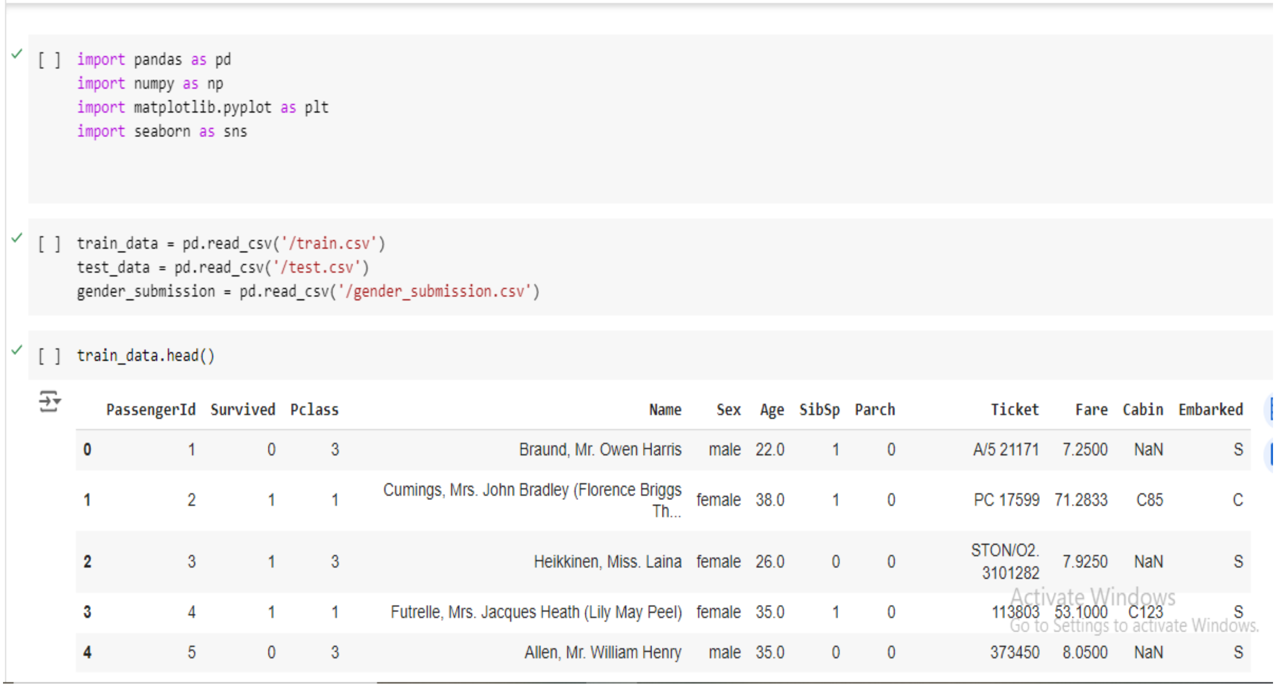
Task 1

Task: Clean a dataset by removing missing values and outliers

Solution:

Step:

1.Import packages and display train dataset and test dataset



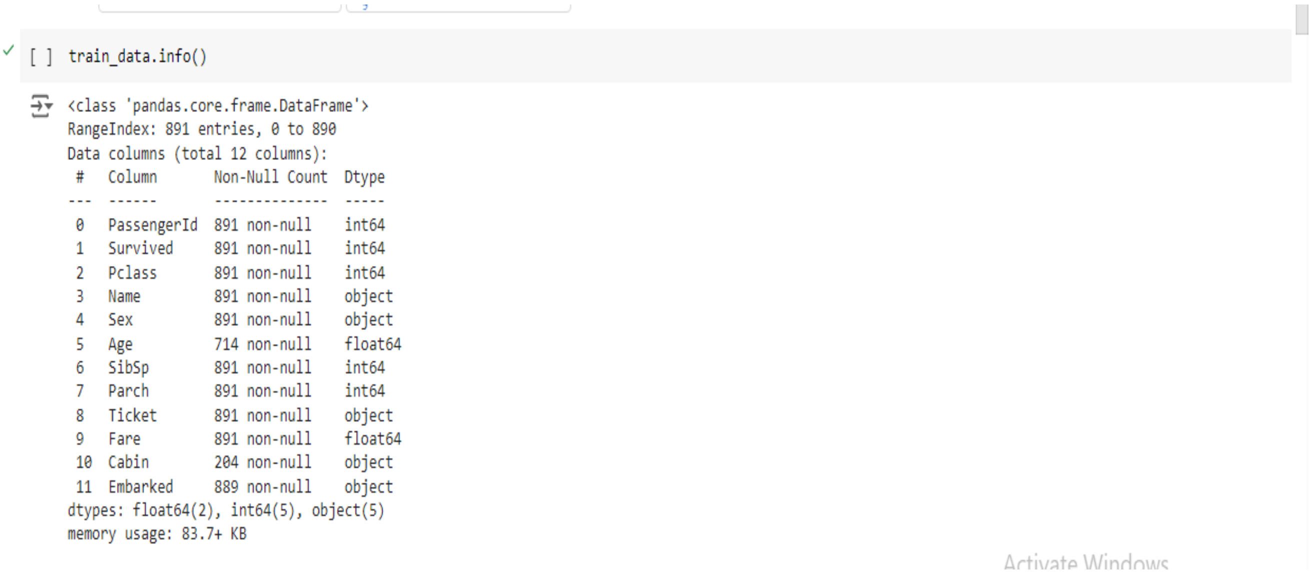
```
[ ] import pandas as pd
    import numpy as np
    import matplotlib.pyplot as plt
    import seaborn as sns
```

```
[ ] train_data = pd.read_csv('/train.csv')
    test_data = pd.read_csv('/test.csv')
    gender_submission = pd.read_csv('/gender_submission.csv')
```

```
[ ] train_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

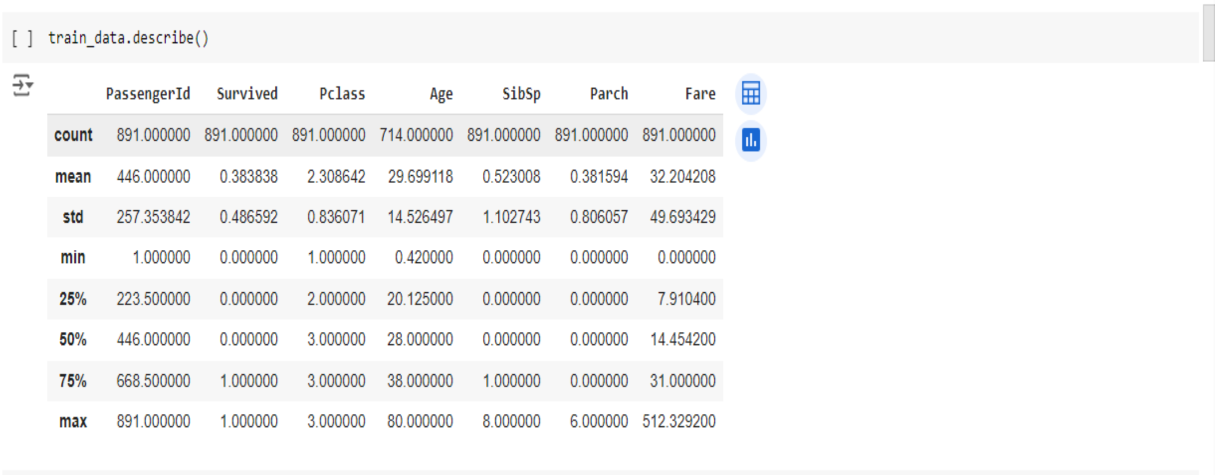
2. Display data types



```
[ ] train_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
```

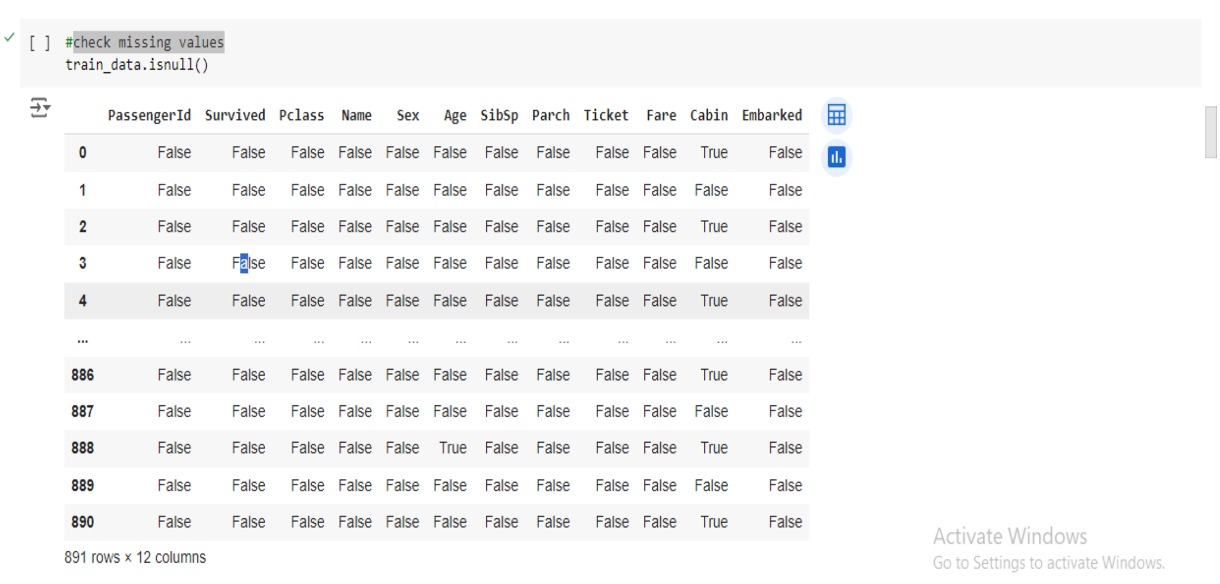
3. Get Summary Statistics for numerical column



```
[ ] train_data.describe()
```

	PassengerId	Survived	Pclass	Age	SibSp	Parch	Fare
count	891.000000	891.000000	891.000000	714.000000	891.000000	891.000000	891.000000
mean	446.000000	0.383838	2.308642	29.699118	0.523008	0.381594	32.204208
std	257.353842	0.486592	0.836071	14.526497	1.102743	0.806057	49.693429
min	1.000000	0.000000	1.000000	0.420000	0.000000	0.000000	0.000000
25%	223.500000	0.000000	2.000000	20.125000	0.000000	0.000000	7.910400
50%	446.000000	0.000000	3.000000	28.000000	0.000000	0.000000	14.454200
75%	668.500000	1.000000	3.000000	38.000000	1.000000	0.000000	31.000000
max	891.000000	1.000000	3.000000	80.000000	8.000000	6.000000	512.329200

4. Get the missing values in train dataset

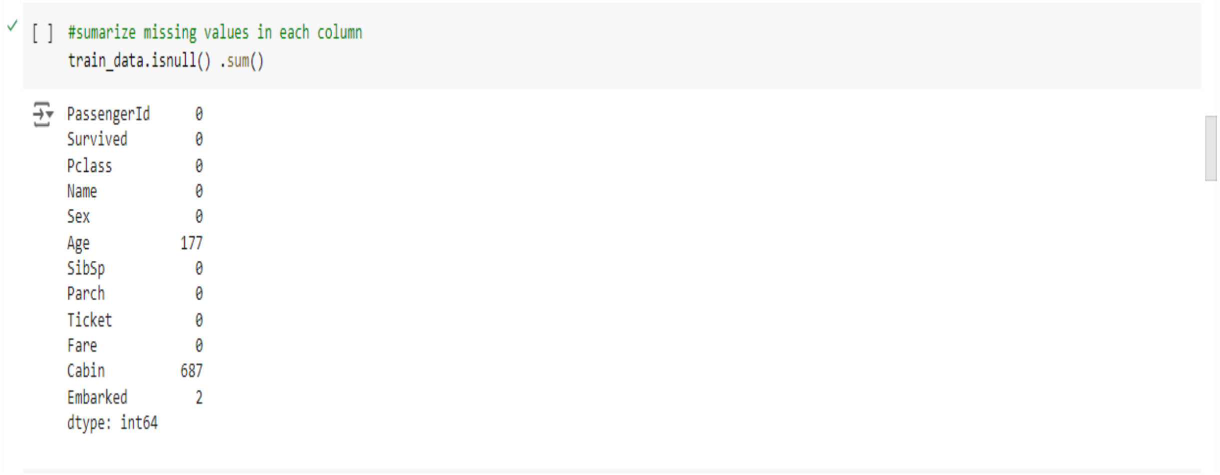


```
[ ] #check missing values
    train_data.isnull()
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	False	False	False	False	False	False	False	False	False	False	True	False
1	False	False	False	False	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False	False	False	True	False
3	False	False	False	False	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False	False	False	True	False
...	...	...	...	...	...	...	...	...	...	...	...	...
886	False	False	False	False	False	False	False	False	False	False	True	False
887	False	False	False	False	False	False	False	False	False	False	False	False
888	False	False	False	False	False	True	False	False	False	False	True	False
889	False	False	False	False	False	False	False	False	False	False	False	False
890	False	False	False	False	False	False	False	False	False	False	True	False

891 rows × 12 columns

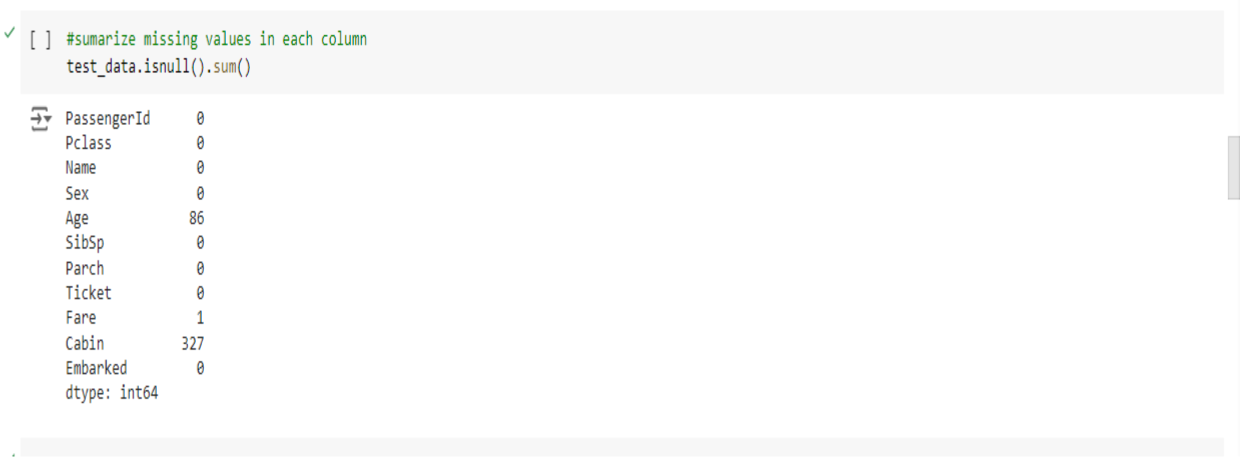
5. Get missing values from train dataset in each column



```
[ ] #sumarize missing values in each column
    train_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
```

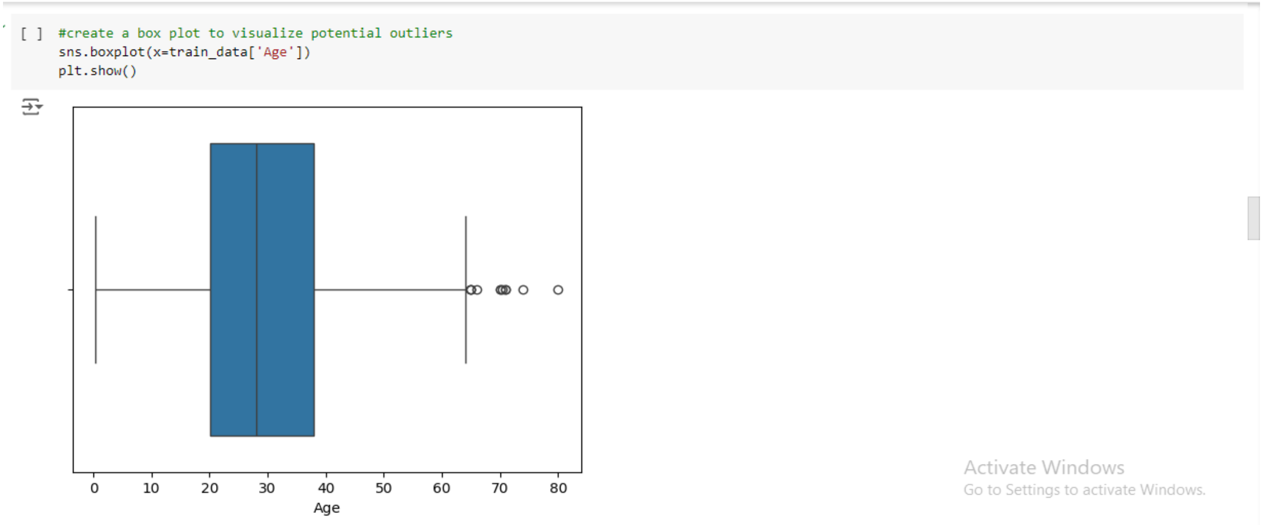
6. Get missing values from test dataset in each column



```
[ ] #sumarize missing values in each column
    test_data.isnull().sum()
```

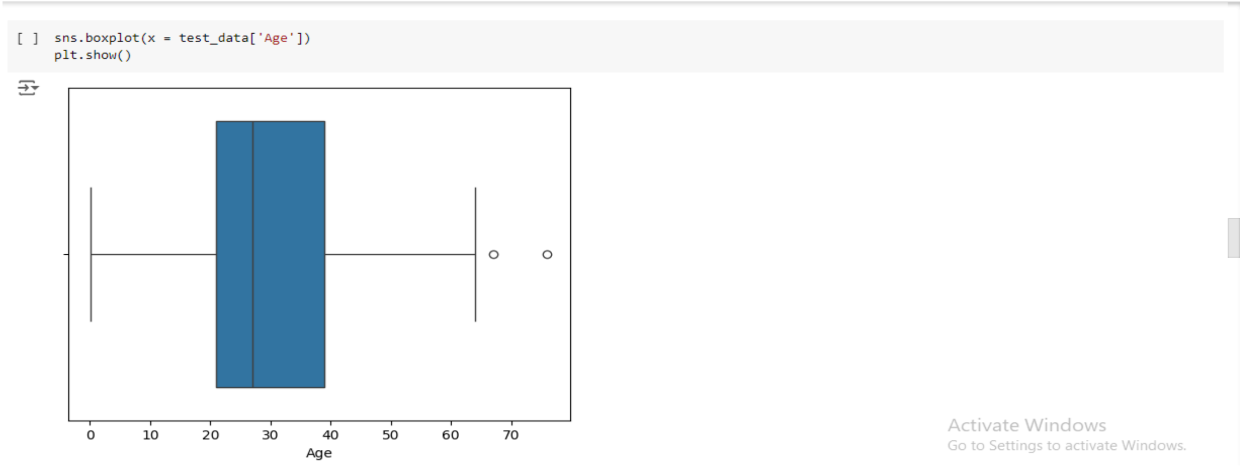
```
PassengerId      0
Pclass           0
Name             0
Sex              0
Age             86
SibSp            0
Parch            0
Ticket           0
Fare             1
Cabin          327
Embarked         0
dtype: int64
```

7. Create a box plot to visualize potential outliers for train dataset(Age)



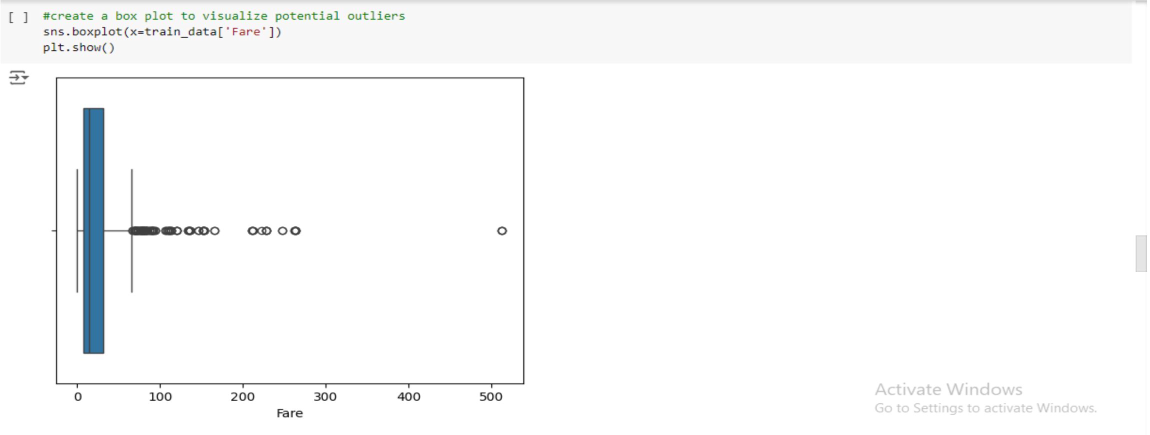
```
[ ] #create a box plot to visualize potential outliers
    sns.boxplot(x=train_data['Age'])
    plt.show()
```

8. Create a box plot to visualize potential outliers for test dataset (Age)



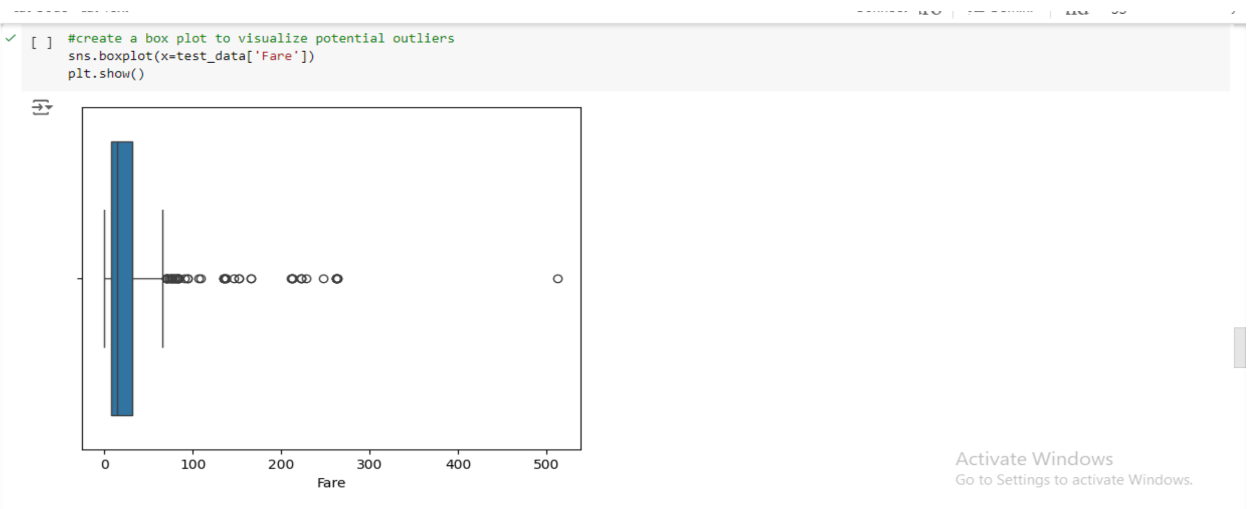
```
[ ] sns.boxplot(x = test_data['Age'])
    plt.show()
```

9. Create a box plot to visualize potential outliers for train dataset (Fare)



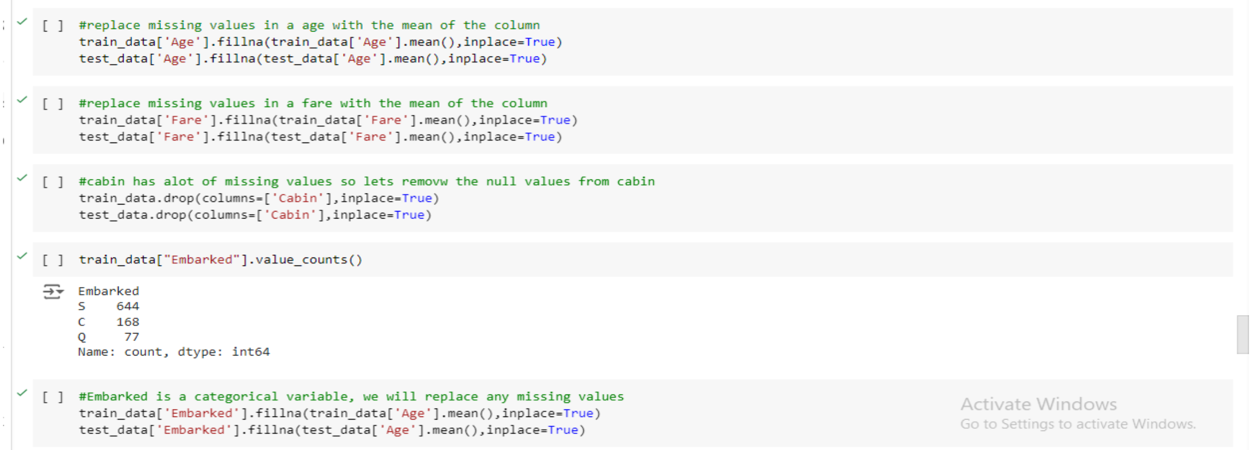
```
[ ] #create a box plot to visualize potential outliers
    sns.boxplot(x=train_data['Fare'])
    plt.show()
```

10. Create a box plot to visualize potential outliers for test dataset(Fare)



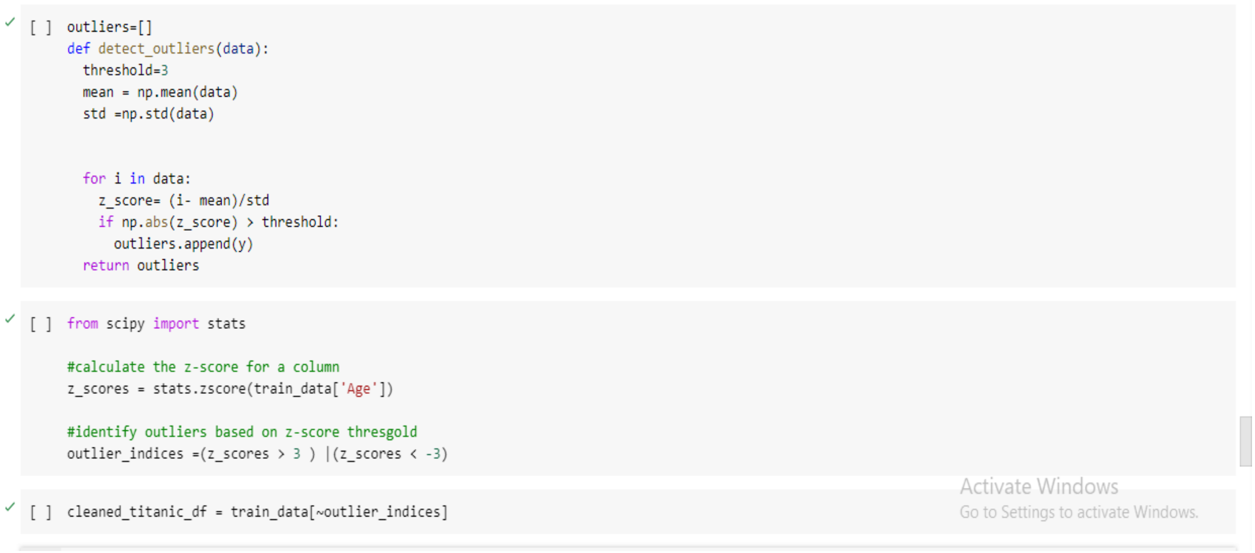
```
[ ] #create a box plot to visualize potential outliers
    sns.boxplot(x=test_data['Fare'])
    plt.show()
```

11. Replace the missing values with mean of the column



```
[ ] #replace missing values in a age with the mean of the column
    train_data['Age'].fillna(train_data['Age'].mean(),inplace=True)
    test_data['Age'].fillna(test_data['Age'].mean(),inplace=True)

[ ] #replace missing values in a fare with the mean of the column
    train_data['Fare'].fillna(train_data['Fare'].mean(),inplace=True)
    test_data['Fare'].fillna(test_data['Fare'].mean(),inplace=True)

[ ] #cabin has alot of missing values so lets removw the null values from cabin
    train_data.drop(columns=['Cabin'],inplace=True)
    test_data.drop(columns=['Cabin'],inplace=True)

[ ] train_data["Embarked"].value_counts()

    Embarked
    S    644
    C    168
    Q     77
    Name: count, dtype: int64

[ ] #Embarked is a categorical variable, we will replace any missing values
    train_data['Embarked'].fillna(train_data['Age'].mean(),inplace=True)
    test_data['Embarked'].fillna(test_data['Age'].mean(),inplace=True)
```

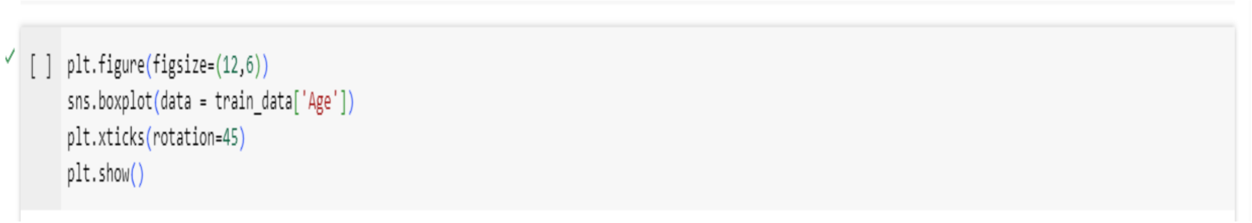
12. outlier



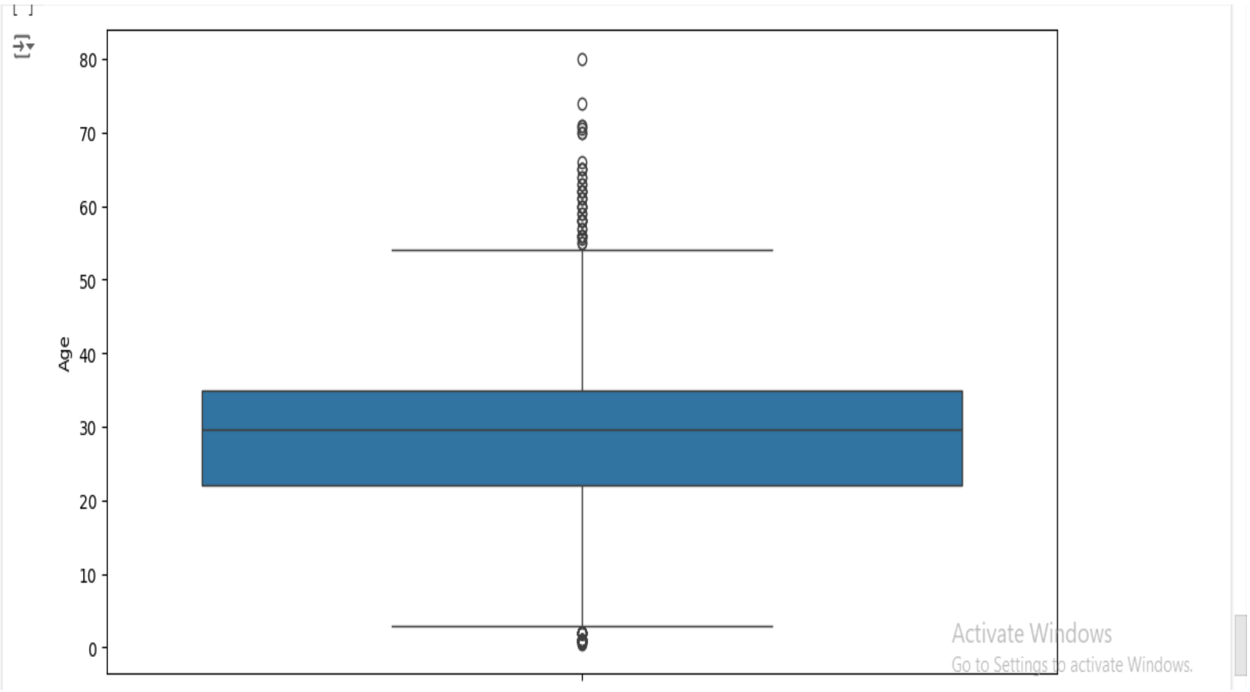
```
outliers=[]
def detect_outliers(data):
  threshold=3
  mean = np.mean(data)
  std =np.std(data)


  for i in data:
    z_score= (i- mean)/std
    if np.abs(z_score) > threshold:
      outliers.append(y)
  return outliers
```

```
from scipy import stats

#calculate the z-score for a column
z_scores = stats.zscore(train_data['Age'])

#identify outliers based on z-score thresgold
outlier_indices =(z_scores > 3 ) |(z_scores < -3)
```

```
cleaned_titanic_df = train_data[~outlier_indices]
```



```
plt.figure(figsize=(12,6))
sns.boxplot(data = train_data['Age'])
plt.xticks(rotation=45)
plt.show()
```


Age