VIT – Foundation – SmartBridge – Artificial Intelligence & Machine Learning in collaboration with Google (Applied Data Science)

Assignment-3

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Assignment 3 : Data Pre-processing

Name : Muni Aswanth Prasad A

Reg.no: 21BCE8854

1. Import necessary Libraries

In [4]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

2. Import the Data set

In [7]:
```
df=pd.read_csv('Titanic-Dataset.csv')
df.shape
df.info()
df
```

```
<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
```

Out[7]:

	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 Helen "Carrie"	female	NaN	1	2	W./C. 6607	23.4500	NaN	S
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.0000	C148	C
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.7500	NaN	Q

891 rows × 12 columns

In [8]:
```
df.describe()
```

Out[8]:

	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

3. Handle Null values

In [66]:
```
df.isnull().any()
```
Out[66]:
```
PassengerId    False
Survived       False
Pclass         False
Name           False
Sex            False
Age             True
SibSp          False
Parch          False
Ticket         False
Fare           False
Cabin           True
Embarked        True
dtype: bool
```
In [67]:
```
df.isnull().sum()
```
Out[67]:
```
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
```
In [68]:
```
df.Embarked.value_counts()
```
Out[68]:
```
Embarked
S    644
C    168
Q     77
Name: count, dtype: int64
```
In [69]:
```
df.Cabin.value_counts()
```
Out[69]:
```
Cabin
B96 B98        4
G6             4
C23 C25 C27    4
C22 C26        3
F33            3
              ..
E34            1
C7             1
C54            1
E36            1
C148           1
Name: count, Length: 147, dtype: int64
```
In [70]:
```
plt.figure(figsize=(50,5))
sns.countplot(x="Cabin", hue="Survived", data=df)
```
```
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
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c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
```
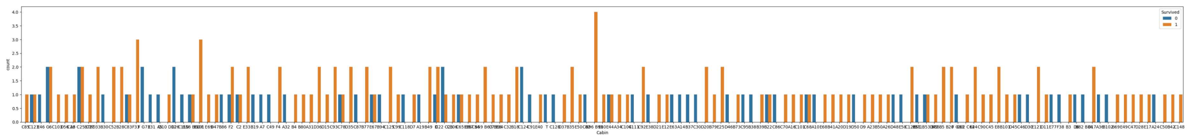
Out[70]:
```
<Axes: xlabel='Cabin', ylabel='count'>
```


In [71]:
```
df['Embarked'].fillna(df['Embarked'].mode()[0],inplace=True)
df['Age'].fillna(df['Age'].mean(),inplace=True)
df.drop(columns=['Cabin'], inplace=True)
df.isnull().sum()
```
Out[71]:
```
PassengerId    0
Survived       0
Pclass         0
Name           0
Sex            0
Age            0
SibSp          0
Parch          0
Ticket         0
Fare           0
Embarked       0
dtype: int64
```

4. Data Visualisation

In [72]:
```
df.corr(numeric_only=True)
```

Out[72]:

	PassengerId	Survived	Pclass	Age	SibSp	Parch	Fare
PassengerId	1.000000	-0.005007	-0.035144	0.033207	-0.057527	-0.001652	0.012658
Survived	-0.005007	1.000000	-0.338481	-0.069809	-0.035322	0.081629	0.257307
Pclass	-0.035144	-0.338481	1.000000	-0.331339	0.083081	0.018443	-0.549500
Age	0.033207	-0.069809	-0.331339	1.000000	-0.232625	-0.179191	0.091566
SibSp	-0.057527	-0.035322	0.083081	-0.232625	1.000000	0.414838	0.159651
Parch	-0.001652	0.081629	0.018443	-0.179191	0.414838	1.000000	0.216225
Fare	0.012658	0.257307	-0.549500	0.091566	0.159651	0.216225	1.000000

In [73]:
```
# sns.countplot(x="Sex", hue="Survived", data=df)
sns.lineplot(x='Sex', y='Survived', data=df)
```

```
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
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c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1119: FutureWarning: use_inf_as_na
option is deprecated and will be removed in a future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1119: FutureWarning: use_inf_as_na
option is deprecated and will be removed in a future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
```
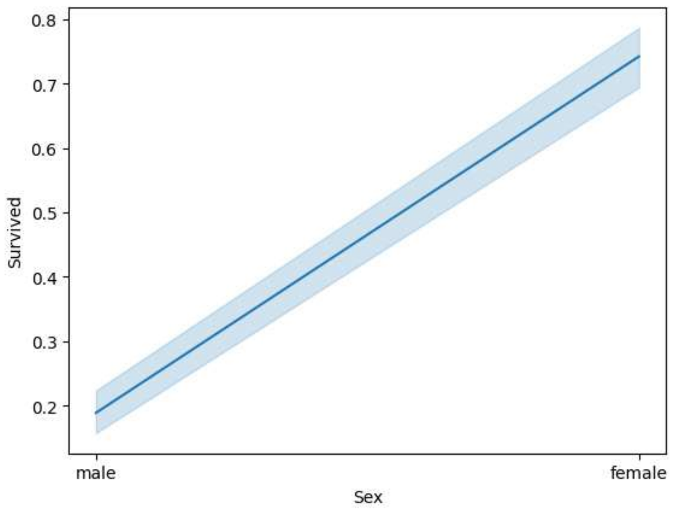
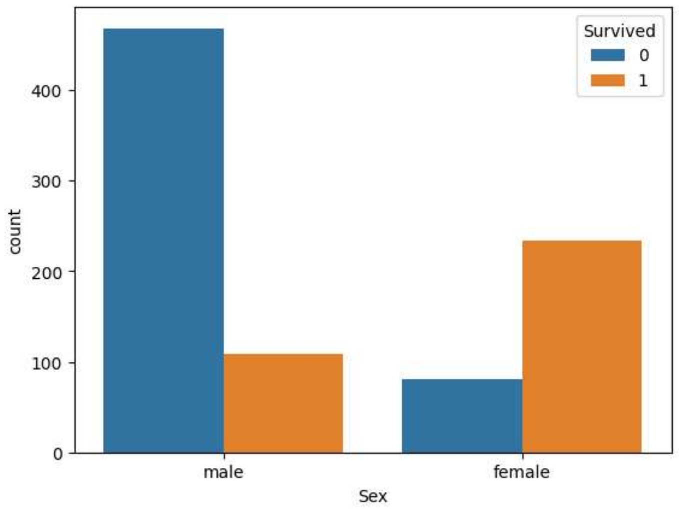

Out[73]:
```
<Axes: xlabel='Sex', ylabel='Survived'>
```



```
In [74]: sns.countplot(x='Sex',hue='Survived',data=df)
```

```
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
```

```
Out[74]: <Axes: xlabel='Sex', ylabel='count'>
```



```
In [75]: sns.lineplot(x='Pclass',y='Survived',data=df)
         sns.countplot(x='Pclass',hue='Survived',data=df)
```

```
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1119: FutureWarning: use_inf_as_na
option is deprecated and will be removed in a future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1119: FutureWarning: use_inf_as_na
option is deprecated and will be removed in a future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
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c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
```
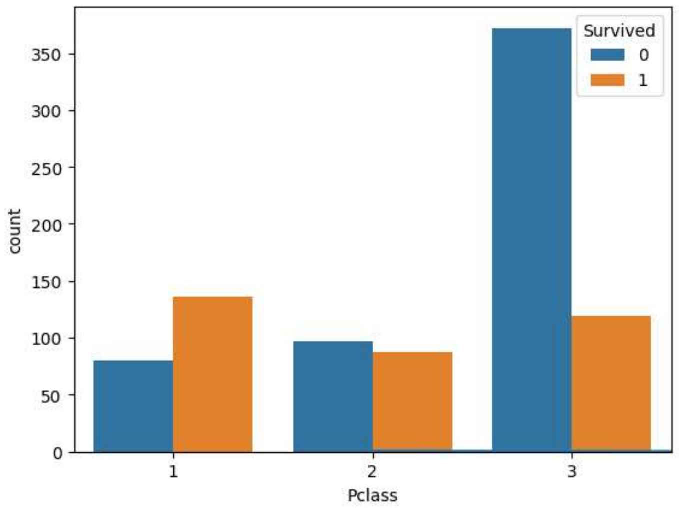
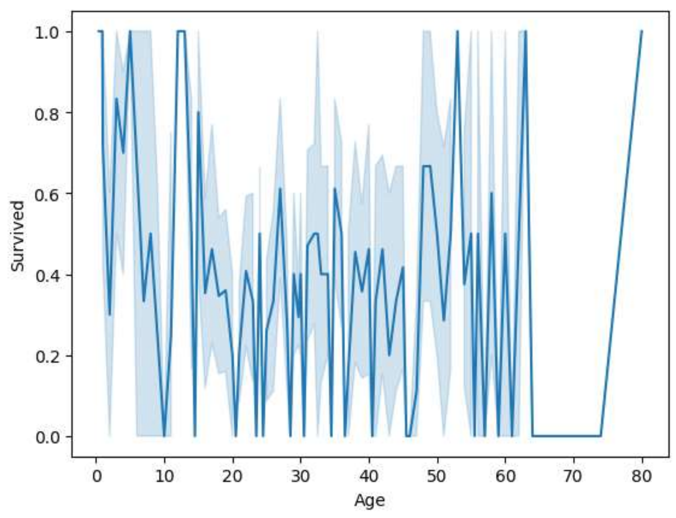

```
Out[75]: <Axes: xlabel='Pclass', ylabel='count'>
```



In [76]:
```
# sns.countplot(x="Age", hue="Survived", data=df)
sns.lineplot(x='Age',y='Survived',data=df)
```

```
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1119: FutureWarning: use_inf_as_na
option is deprecated and will be removed in a future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1119: FutureWarning: use_inf_as_na
option is deprecated and will be removed in a future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
```

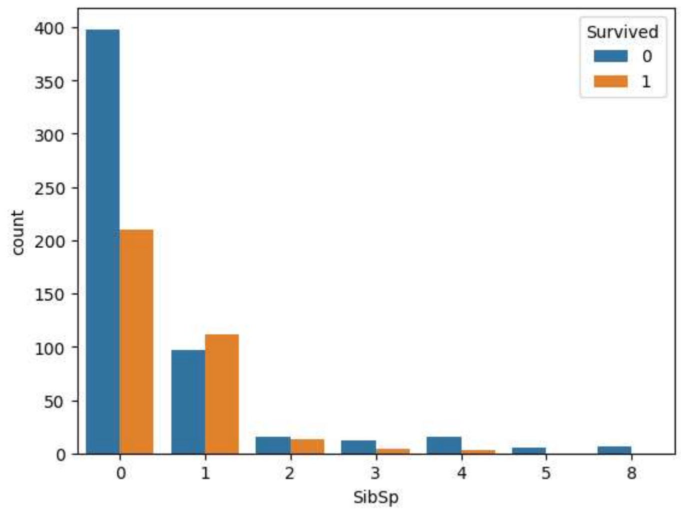
Out[76]:
```
<Axes: xlabel='Age', ylabel='Survived'>
```



In [77]:
```
sns.countplot(x='SibSp',hue='Survived',data=df)
```

```
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
```

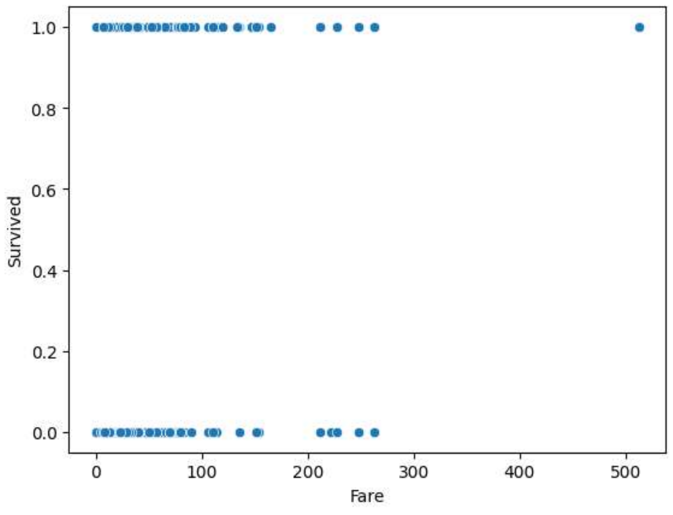
Out[77]:
```
<Axes: xlabel='SibSp', ylabel='count'>
```



```
In [78]: sns.scatterplot(x='Fare',y='Survived',data=df)
```

```
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
```

```
Out[78]: <Axes: xlabel='Fare', ylabel='Survived'>
```



5. Outlier Detection

```
In [79]: df.SibSp.value_counts()
```

```
Out[79]: SibSp
0    608
1    209
2     28
4     18
3     16
8      7
5      5
Name: count, dtype: int64
```

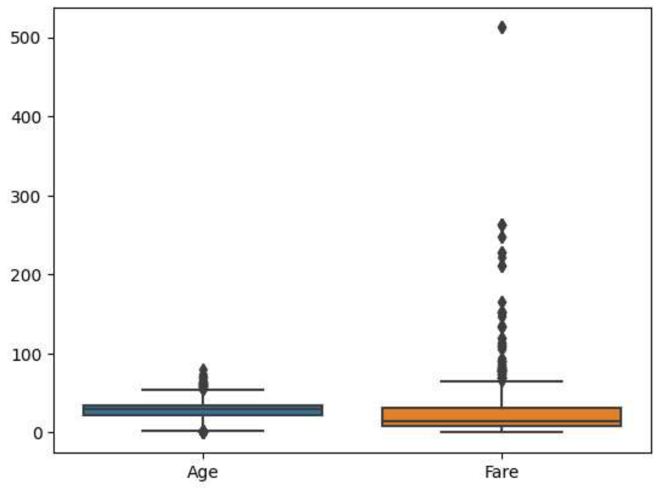
```
In [80]: df.Parch.value_counts()
```

```
Out[80]: Parch
0    678
1    118
2     80
5      5
3      5
4      4
6      1
Name: count, dtype: int64
```

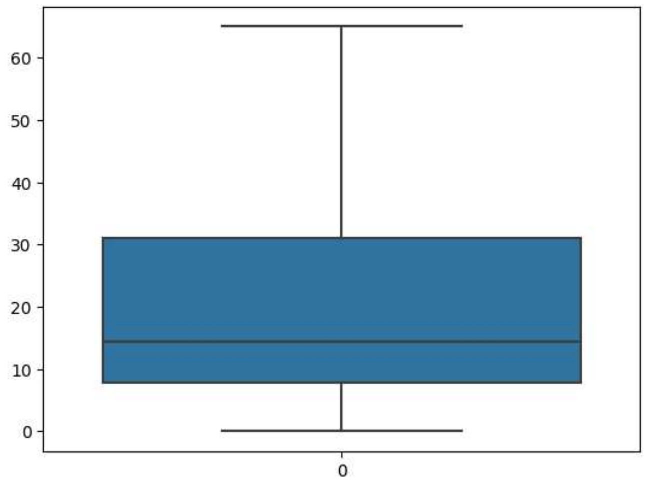
```
In [88]: df.Pclass.value_counts()
```

```
Out[88]: Pclass
3    491
1    216
2    184
Name: count, dtype: int64
```

```
In [81]: sns.boxplot(df[['Age','Fare']])

         c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
         l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
           if pd.api.types.is_categorical_dtype(vector):
         c:\Users\indup\AppData\Local\Programs\Python\Python310\lib\site-packages\seaborn\_oldcore.py:1498: FutureWarning: is_categorica
         l_dtype is deprecated and will be removed in a future version. Use isinstance(dtype, CategoricalDtype) instead
           if pd.api.types.is_categorical_dtype(vector):

Out[81]: <Axes: >
```

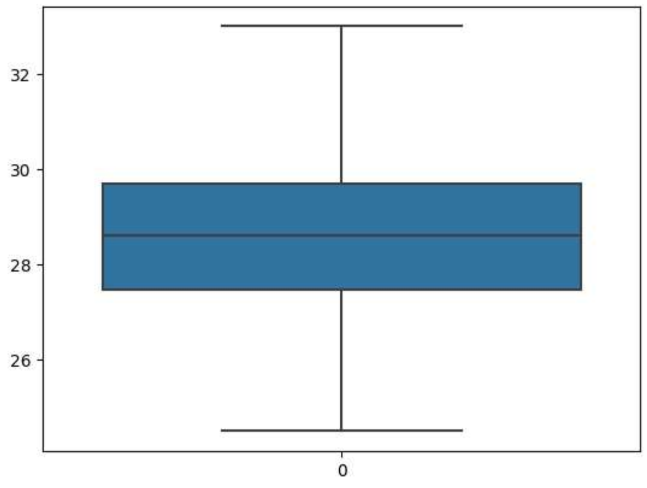


```
In [82]: q1_Fare=df['Fare'].quantile(0.25)
         q3_Fare=df['Fare'].quantile(0.75)
         IQR_Fare=q3_Fare-q1_Fare
         lowerbound_Fare=q1_Fare-1.5*IQR_Fare
         upperbound_Fare=q3_Fare+1.5*IQR_Fare
         df['Fare']=np.where(df['Fare']>=upperbound_Fare,df['Fare'].mean(),df['Fare'])
         sns.boxplot(df['Fare'])

Out[82]: <Axes: >
```



In [87]:
```python
q1_Age=df['Age'].quantile(0.25)
q3_Age=df['Age'].quantile(0.75)
IQR_Age=q3_Age-q1_Age
lowerbound_Age=q1_Age-1.5*IQR_Age
upperbound_Age=q3_Age+1.5*IQR_Age
df['Age']=np.where((df['Age'] >= upperbound_Age),df['Age'].mean(),df['Age'])
df['Age']=np.where((df['Age'] <= lowerbound_Age),df['Age'].mean(),df['Age'])
# df['Age'] = np.where((df['Age'] <= lowerbound_Age) | (df['Age'] >= upperbound_Age), df['Age'].mean(), df['Age'])
sns.boxplot(df['Age'])
```

Out[87]:
```
<Axes: >
```



6. Splitting Dependent and Independent variables

In [89]:
```python
df
```

Out[89]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	27.476308	1	0	A/5 21171	7.250000	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	28.599643	1	0	PC 17599	32.204208	C
2	3	1	3	Heikkinen, Miss. Laina	female	26.000000	0	0	STON/O2. 3101282	7.925000	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	27.994120	1	0	113803	53.100000	S
4	5	0	3	Allen, Mr. William Henry	male	27.994120	0	0	373450	8.050000	S
...	...	...	...	...	...	...	...	...	...	...	...
886	887	0	2	Montvila, Rev. Juozas	male	27.000000	0	0	211536	13.000000	S
887	888	1	1	Graham, Miss. Margaret Edith	female	27.476308	0	0	112053	30.000000	S
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	29.699118	1	2	W./C. 6607	23.450000	S
889	890	1	1	Behr, Mr. Karl Howell	male	26.000000	0	0	111369	30.000000	C
890	891	0	3	Dooley, Mr. Patrick	male	32.000000	0	0	370376	7.750000	Q

891 rows × 11 columns

In [ ]:
```python
Independent=df.drop(columns=['Survived'])
Target=df['Survived']
Independent
```

7. Encoding

In [91]:
```python
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 11 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          891 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  Embarked     891 non-null    object 
dtypes: float64(2), int64(5), object(4)
memory usage: 76.7+ KB
```

In [ ]:
```python
from sklearn.preprocessing import LabelEncoder
le=LabelEncoder()
Independent['Name'] = le.fit_transform(df['Name'])
Independent['Name']
dict(zip((le.classes_), range(len(le.classes_))))
```

In [101]:
```
from sklearn.preprocessing import LabelEncoder
le=LabelEncoder()
Independent['Sex'] = le.fit_transform(df['Sex'])
Independent['Sex']
dict(zip((le.classes_),range(len(le.classes_))))
```
Out[101]:
```
{'female': 0, 'male': 1}
```

In [ ]:
```
from sklearn.preprocessing import LabelEncoder
le=LabelEncoder()
Independent['Ticket'] = le.fit_transform(df['Ticket'])
Independent['Ticket']
dict(zip((le.classes_),range(len(le.classes_))))
```

In [103]:
```
from sklearn.preprocessing import LabelEncoder
le=LabelEncoder()
Independent['Embarked'] = le.fit_transform(df['Embarked'])
Independent['Embarked']
dict(zip((le.classes_),range(len(le.classes_))))
```
Out[103]:
```
{'C': 0, 'Q': 1, 'S': 2}
```

In [104]:
```
Independent.head()
```
Out[104]:

	PassengerId	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Embarked
0	1	3	108	1	27.476308	1	0	523	7.250000	2
1	2	1	190	0	28.599643	1	0	596	32.204208	0
2	3	3	353	0	26.000000	0	0	669	7.925000	2
3	4	1	272	0	27.994120	1	0	49	53.100000	2
4	5	3	15	1	27.994120	0	0	472	8.050000	2

8. Feature Scaling

In [105]:
```
from sklearn.preprocessing import StandardScaler
sc=StandardScaler()
Independent_scaled=pd.DataFrame(sc.fit_transform(Independent),columns=Independent.columns)
Independent_scaled
```
Out[105]:

	PassengerId	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Embarked
0	-1.730108	0.827377	-1.310217	0.737695	-0.887023	0.432793	-0.473674	0.918966	-0.918474	0.585954
1	-1.726220	-1.566107	-0.991410	-1.355574	-0.081079	0.432793	-0.473674	1.282625	0.923286	-1.942303
2	-1.722332	0.827377	-0.357685	-1.355574	-1.946209	-0.474545	-0.473674	1.646283	-0.868656	0.585954
3	-1.718444	-1.566107	-0.672604	-1.355574	-0.515516	0.432793	-0.473674	-1.442322	2.465512	0.585954
4	-1.714556	0.827377	-1.671790	0.737695	-0.515516	-0.474545	-0.473674	0.664904	-0.859430	0.585954
...	...	...	...	...	...	...	...	...	...	...
886	1.714556	-0.369365	0.400452	0.737695	-1.228753	-0.474545	-0.473674	-1.183277	-0.494092	0.585954
887	1.718444	-1.566107	-0.552079	-1.355574	-0.887023	-0.474545	-0.473674	-1.616678	0.760603	0.585954
888	1.722332	0.827377	-0.124412	-1.355574	0.707745	0.432793	2.008933	1.676173	0.277176	0.585954
889	1.726220	-1.566107	-1.415189	0.737695	-1.946209	-0.474545	-0.473674	-1.646568	0.760603	-1.942303
890	1.730108	0.827377	-0.874774	0.737695	2.358527	-0.474545	-0.473674	0.635014	-0.881572	-0.678175

891 rows × 10 columns

9. Splitting Data into Train and Test

In [108]:
```
from sklearn.model_selection import train_test_split
Independent_train,Independent_test,Target_train,Target_test=train_test_split(Independent_scaled,Target,test_size=0.2,random_state
print(Independent.shape,Target.shape)
print(Independent_train.shape,Independent_test.shape,Target_train.shape,Target_test.shape)
```
```
(891, 10) (891,)
(712, 10) (179, 10) (712,) (179,)
```