# 15TH_SEPTEMBER_ASSIGNMENT

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## Steps:

1.import the necessary libraries

2.import the dataset

3.Handling null values

4.outlier detection---surya

5.Seperate Dependent and independent variables

6.Encoding

7.splitting into training and testing set

8.Feature scaling

## 1.import the necessary libraries

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from scipy import stats
from sklearn.preprocessing import LabelEncoder
from sklearn.preprocessing import StandardScaler
from sklearn.model_selection import train_test_split
```

## 2.import the dataset

```
#.csv  .tsv ,json,.excel
dataset=pd.read_csv("Titanic-Dataset.csv")
#dataset=pd.read_csv(r"D:\SmartBridge\VIT_morning_slot\Churn_Modelling.csv")
```

```
dataset
```

| | PassengerId | Survived | Pclass | Name | Sex | Age | SibSp | Parch | Ticket | Fare | Cabin |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | 0 | 3 | Braund, Mr. Owen Harris | male | 22.0 | 1 | 0 | A/5 21171 | 7.2500 | NaN |
| **1** | 2 | 1 | 1 | Cumings, Mrs. John Bradley (Florence Briggs Th... | female | 38.0 | 1 | 0 | PC 17599 | 71.2833 | C85 |
| **2** | 3 | 1 | 3 | Heikkinen, Miss. Laina | female | 26.0 | 0 | 0 | STON/O2. 3101282 | 7.9250 | NaN |
| **3** | 4 | 1 | 1 | Futrelle, Mrs. Jacques Heath (Lily May Peel) | female | 35.0 | 1 | 0 | 113803 | 53.1000 | C123 |
| **4** | 5 | 0 | 3 | Allen, Mr. William Henry | male | 35.0 | 0 | 0 | 373450 | 8.0500 | NaN |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **886** | 887 | 0 | 2 | Montvila, Rev. Juozas | male | 27.0 | 0 | 0 | 211536 | 13.0000 | NaN |
| **887** | 888 | 1 | 1 | Graham, Miss. Margaret Edith | female | 19.0 | 0 | 0 | 112053 | 30.0000 | B42 |
| **888** | 889 | 0 | 3 | Johnston, Miss. Catherine Helen "Carrie" | female | NaN | 1 | 2 | W./C. 6607 | 23.4500 | NaN |
| **889** | 890 | 1 | 1 | Behr, Mr. Karl Howell | male | 26.0 | 0 | 0 | 111369 | 30.0000 | C148 |
| **890** | 891 | 0 | 3 | Dooley, Mr. Patrick | male | 32.0 | 0 | 0 | 370376 | 7.7500 | NaN |

891 rows × 12 columns

```
dataset.head()
```

| | PassengerId | Survived | Pclass | Name | Sex | Age | SibSp | Parch | Ticket | Fare | Cabin |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | 0 | 3 | Braund, Mr. Owen Harris | male | 22.0 | 1 | 0 | A/5 21171 | 7.2500 | NaN |
| **1** | 2 | 1 | 1 | Cumings, Mrs. John Bradley (Florence Briggs Th... | female | 38.0 | 1 | 0 | PC 17599 | 71.2833 | C85 |
| **2** | 3 | 1 | 3 | Heikkinen, Miss. Laina | female | 26.0 | 0 | 0 | STON/O2. 3101282 | 7.9250 | NaN |
| **3** | 4 | 1 | 1 | Futrelle, Mrs. Jacques Heath (Lily May Peel) | female | 35.0 | 1 | 0 | 113803 | 53.1000 | C123 |
| **4** | 5 | 0 | 3 | Allen, Mr. William Henry | male | 35.0 | 0 | 0 | 373450 | 8.0500 | NaN |

```
dataset.tail()
```

| | PassengerId | Survived | Pclass | Name | Sex | Age | SibSp | Parch | Ticket | Fare | Cabin | Embarked |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **886** | 887 | 0 | 2 | Montvila, Rev. Juozas | male | 27.0 | 0 | 0 | 211536 | 13.00 | NaN | S |
| **887** | 888 | 1 | 1 | Graham, Miss. Margaret Edith | female | 19.0 | 0 | 0 | 112053 | 30.00 | B42 | S |
| **888** | 889 | 0 | 3 | Johnston, Miss. Catherine Helen "Carrie" | female | NaN | 1 | 2 | W./C. 6607 | 23.45 | NaN | S |
| **889** | 890 | 1 | 1 | Behr, Mr. Karl Howell | male | 26.0 | 0 | 0 | 111369 | 30.00 | C148 | C |
| **890** | 891 | 0 | 3 | Dooley, Mr. Patrick | male | 32.0 | 0 | 0 | 370376 | 7.75 | NaN | Q |

```
dataset.shape
```

```
(891, 12)
```

```
dataset.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
```

```
dataset.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 |

```
corr=dataset.corr()
corr
```

```
<ipython-input-113-f22ca9e9dc13>:1: FutureWarning: The default value of numeric_only in DataFrame.corr is deprecated. In a future versio
  corr=dataset.corr()
```

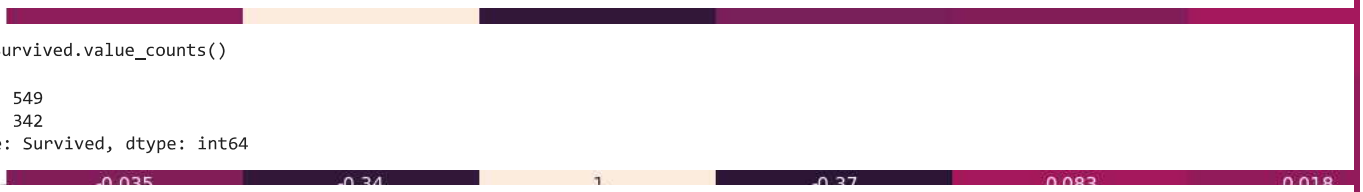
| | PassengerId | Survived | Pclass | Age | SibSp | Parch | Fare |
|---|---|---|---|---|---|---|---|
| **PassengerId** | 1.000000 | -0.005007 | -0.035144 | 0.036847 | -0.057527 | -0.001652 | 0.012658 |
| **Survived** | -0.005007 | 1.000000 | -0.338481 | -0.077221 | -0.035322 | 0.081629 | 0.257307 |
| **Pclass** | -0.035144 | -0.338481 | 1.000000 | -0.369226 | 0.083081 | 0.018443 | -0.549500 |
| **Age** | 0.036847 | -0.077221 | -0.369226 | 1.000000 | -0.308247 | -0.189119 | 0.096067 |
| **SibSp** | -0.057527 | -0.035322 | 0.083081 | -0.308247 | 1.000000 | 0.414838 | 0.159651 |
| **Parch** | -0.001652 | 0.081629 | 0.018443 | -0.189119 | 0.414838 | 1.000000 | 0.216225 |

```
plt.subplots(figsize=(20,15))
sns.heatmap(corr,annot=True)
```

```
<Axes: >
```

```
dataset.PassengerId.value_counts()
```

```
1      1
599    1
588    1
589    1
590    1
      ..
301    1
302    1
303    1
304    1
891    1
Name: PassengerId, Length: 891, dtype: int64
```



```
dataset.Survived.value_counts()
```

```
0    549
1    342
Name: Survived, dtype: int64
```



```
dataset.head()
```

| | PassengerId | Survived | Pclass | Name | Sex | Age | SibSp | Parch | Ticket | Fare | Cabin |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | 0 | 3 | Braund, Mr. Owen Harris | male | 22.0 | 1 | 0 | A/5 21171 | 7.2500 | NaN |
| **1** | 2 | 1 | 1 | Cumings, Mrs. John Bradley (Florence Briggs Th... | female | 38.0 | 1 | 0 | PC 17599 | 71.2833 | C85 |
| **2** | 3 | 1 | 3 | Heikkinen, Miss. Laina | female | 26.0 | 0 | 0 | STON/O2. 3101282 | 7.9250 | NaN |
| **3** | 4 | 1 | 1 | Futrelle, Mrs. Jacques Heath (Lily May Peel) | female | 35.0 | 1 | 0 | 113803 | 53.1000 | C123 |
| **4** | 5 | 0 | 3 | Allen, Mr. William Henry | male | 35.0 | 0 | 0 | 373450 | 8.0500 | NaN |

```
dataset.    Pclass.value_counts()
```

```
3    491
1    216
2    184
Name: Pclass, dtype: int64
```

## 3.Handling null values

```
dataset.isnull().any()
```

```
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
```

```
dataset.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
```

```
dataset["Age"].fillna(dataset["Age"].mean(),inplace=True)
```

```
dataset["Cabin"].fillna(dataset["Cabin"].mode()[0],inplace=True)
```

```
dataset["Embarked"].fillna(dataset["Embarked"].mode()[0],inplace=True)
```

```
dataset.isnull().sum()
```

```
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
```

```
dataset.head()
```

| | PassengerId | Survived | Pclass | Name | Sex | Age | SibSp | Parch | Ticket | Fare | Cabin |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | 0 | 3 | Braund, Mr. Owen Harris | male | 22.0 | 1 | 0 | A/5 21171 | 7.2500 | B96 B98 |
| **1** | 2 | 1 | 1 | Cumings, Mrs. John Bradley (Florence Briggs Th... | female | 38.0 | 1 | 0 | PC 17599 | 71.2833 | C85 |
| **2** | 3 | 1 | 3 | Heikkinen, Miss. Laina | female | 26.0 | 0 | 0 | STON/O2. 3101282 | 7.9250 | B96 B98 |
| **3** | 4 | 1 | 1 | Futrelle, Mrs. Jacques Heath (Lily May Peel) | female | 35.0 | 1 | 0 | 113803 | 53.1000 | C123 |
| **4** | 5 | 0 | 3 | Allen, Mr. William Henry | male | 35.0 | 0 | 0 | 373450 | 8.0500 | B96 B98 |

## 4.outliers

```
z_scores = np.abs(stats.zscore(dataset['Age']))
max_threshold=3
outliers = dataset['Age'][z_scores > max_threshold]

# Print and visualize the outliers
print("Outliers detected using Z-Score:")
print(outliers)
```

```
Outliers detected using Z-Score:
96     71.0
116    70.5
493    71.0
630    80.0
672    70.0
745    70.0
851    74.0
Name: Age, dtype: float64
```

```
z_scores = np.abs(stats.zscore(dataset['Fare']))
max_threshold=3
outliers = dataset['Fare'][z_scores > max_threshold]

# Print and visualize the outliers
print("Outliers detected using Z-Score:")
print(outliers)
```

```
Outliers detected using Z-Score:
27     263.0000
88     263.0000
118    247.5208
258    512.3292
```

```
299    247.5208
311    262.3750
341    263.0000
377    211.5000
380    227.5250
438    263.0000
527    221.7792
557    227.5250
679    512.3292
689    211.3375
700    227.5250
716    227.5250
730    211.3375
737    512.3292
742    262.3750
779    211.3375
Name: Fare, dtype: float64
```

```
column_name = 'Fare'

# Calculate the first quartile (Q1) and third quartile (Q3)
Q1 = dataset[column_name].quantile(0.25)
Q3 = dataset[column_name].quantile(0.75)

# Calculate the IQR
IQR = Q3 - Q1

# Define the lower and upper bounds for outliers
lower_bound = Q1 - 1.5 * IQR
upper_bound = Q3 + 1.5 * IQR

# Filter rows with values outside the IQR bounds
dataset_cleaned = dataset[(dataset[column_name] > lower_bound) & (dataset[column_name] <upper_bound)]

# Display the original and cleaned DataFrame sizes
print(f"Original DataFrame size: {dataset.shape}")
print(f"Cleaned DataFrame size: {dataset_cleaned.shape}")
dataset_cleaned
```

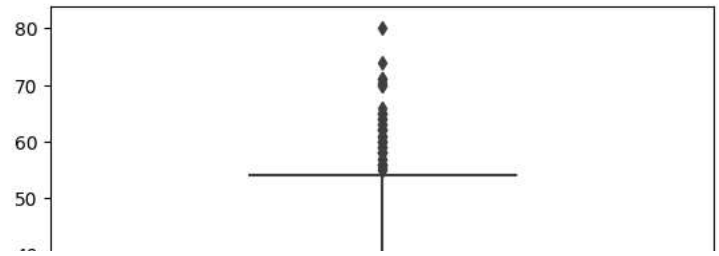
```
Original DataFrame size: (891, 12)
Cleaned DataFrame size: (775, 12)
```

| | PassengerId | Survived | Pclass | Name | Sex | Age | SibSp | Parch | Ticket | Fare | Cab |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | 0 | 3 | Braund, Mr. Owen Harris | male | 22.000000 | 1 | 0 | A/5 21171 | 7.2500 | B96 B |
| **2** | 3 | 1 | 3 | Heikkinen, Miss. Laina | female | 26.000000 | 0 | 0 | STON/O2. 3101282 | 7.9250 | B96 B |
| **3** | 4 | 1 | 1 | Futrelle, Mrs. Jacques Heath (Lily May Peel) | female | 35.000000 | 1 | 0 | 113803 | 53.1000 | C1 |
| **4** | 5 | 0 | 3 | Allen, Mr. William Henry | male | 35.000000 | 0 | 0 | 373450 | 8.0500 | B96 B |
| **5** | 6 | 0 | 3 | Moran, Mr. James | male | 29.699118 | 0 | 0 | 330877 | 8.4583 | B96 B |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| **886** | 887 | 0 | 2 | Montvila, Rev. Juozas | male | 27.000000 | 0 | 0 | 211536 | 13.0000 | B96 B |
| **887** | 888 | 1 | 1 | Graham, Miss. Margaret Edith | female | 19.000000 | 0 | 0 | 112053 | 30.0000 | B |
| **888** | 889 | 0 | 3 | Johnston, Miss. Catherine Helen "Carrie" | female | 29.699118 | 1 | 2 | W./C. 6607 | 23.4500 | B96 B |
| **889** | 890 | 1 | 1 | Behr, Mr. Karl Howell | male | 26.000000 | 0 | 0 | 111369 | 30.0000 | C1 |
| **890** | 891 | 0 | 3 | Dooley, Mr. Patrick | male | 32.000000 | 0 | 0 | 370376 | 7.7500 | B96 B |

775 rows × 12 columns

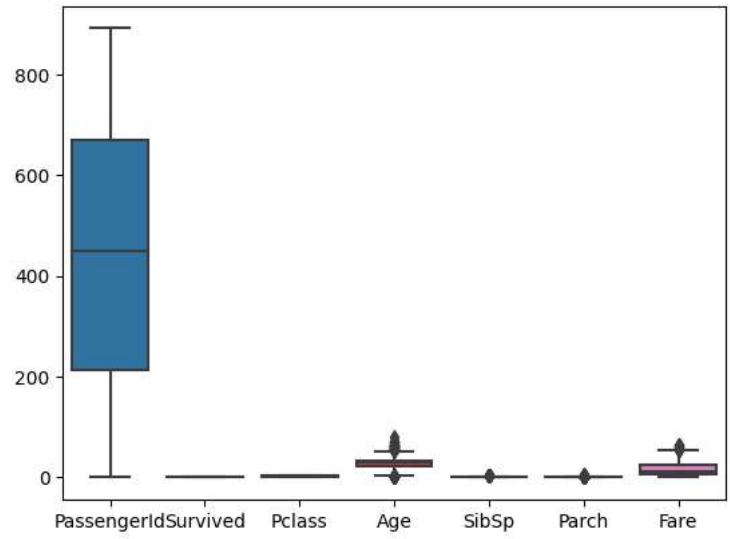
```
sns.boxplot(dataset.Age)
```

```
<Axes: >
```




```
sns.boxplot(dataset_cleaned)
```

```
<Axes: >
```




```
dataset=dataset_cleaned
```

```
x=dataset.drop('Survived', axis=1)
y=dataset['Survived']
```

```
x.head()
```

| | PassengerId | Pclass | Name | Sex | Age | SibSp | Parch | Ticket | Fare | Cabin | Embarked |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | 3 | Braund, Mr. Owen Harris | male | 22.000000 | 1 | 0 | A/5 21171 | 7.2500 | B96 B98 | S |
| **2** | 3 | 3 | Heikkinen, Miss. Laina | female | 26.000000 | 0 | 0 | STON/O2. 3101282 | 7.9250 | B96 B98 | S |
| **3** | 4 | 1 | Futrelle, Mrs. Jacques Heath (Lily May Peel) | female | 35.000000 | 1 | 0 | 113803 | 53.1000 | C123 | S |
| **4** | 5 | 3 | Allen, Mr. William Henry | male | 35.000000 | 0 | 0 | 373450 | 8.0500 | B96 B98 | S |
| **5** | 6 | 3 | Moran, Mr. James | male | 29.699118 | 0 | 0 | 330877 | 8.4583 | B96 B98 | Q |

```
y.head()
```

```
0    0
2    1
3    1
4    0
5    0
Name: Survived, dtype: int64
```

## 5.Seperate dependent and independent variables

```
#datset.iloc[rows,column]
x=dataset.iloc[:,3:13]
y=dataset.iloc[:,13:14]
```

```
x.head()
```

| | Name | Sex | Age | SibSp | Parch | Ticket | Fare | Cabin | Embarked |
|---|---|---|---|---|---|---|---|---|---|
| **0** | Braund, Mr. Owen Harris | male | 22.000000 | 1 | 0 | A/5 21171 | 7.2500 | B96 B98 | S |
| **2** | Heikkinen, Miss. Laina | female | 26.000000 | 0 | 0 | STON/O2. 3101282 | 7.9250 | B96 B98 | S |
| **3** | Futrelle, Mrs. Jacques Heath (Lily May Peel) | female | 35.000000 | 1 | 0 | 113803 | 53.1000 | C123 | S |
| **4** | Allen, Mr. William Henry | male | 35.000000 | 0 | 0 | 373450 | 8.0500 | B96 B98 | S |
| **5** | Moran, Mr. James | male | 29.699118 | 0 | 0 | 330877 | 8.4583 | B96 B98 | Q |

```
y.head()
```

| |
|---|
| **0** |
| **2** |
| **3** |
| **4** |
| **5** |

```
dataset.shape
```

```
(775, 12)
```

```
x.shape
```

```
(775, 9)
```

```
y.shape
```

```
(775, 0)
```

## 6.Encoding

### Label encoding on Gender column

```
from sklearn.preprocessing import LabelEncoder
```

```
le=LabelEncoder()
```

```
x["Sex"]=le.fit_transform(x["Sex"])
```

```
x["Sex"]
```

```
0      1
2      0
3      0
4      1
5      1
      ..
886    1
887    0
888    0
889    1
890    1
Name: Sex, Length: 775, dtype: int64
```

```
x["Sex"].value_counts()
```

```
1    531
0    244
Name: Sex, dtype: int64
```

```
x["Sex"].nunique()
```

```
2
```

```
x.head()
```

| | Name | Sex | Age | SibSp | Parch | Ticket | Fare | Cabin | Embarked |
|---|---|---|---|---|---|---|---|---|---|
| **0** | Braund, Mr. Owen Harris | 1 | 22.000000 | 1 | 0 | A/5 21171 | 7.2500 | B96 B98 | S |
| **2** | Heikkinen, Miss. Laina | 0 | 26.000000 | 0 | 0 | STON/O2. 3101282 | 7.9250 | B96 B98 | S |
| **3** | Futrelle, Mrs. Jacques Heath (Lily May Peel) | 0 | 35.000000 | 1 | 0 | 113803 | 53.1000 | C123 | S |
| **4** | Allen, Mr. William Henry | 1 | 35.000000 | 0 | 0 | 373450 | 8.0500 | B96 B98 | S |
| **5** | Moran, Mr. James | 1 | 29.699118 | 0 | 0 | 330877 | 8.4583 | B96 B98 | Q |

```
x.Sex.value_counts()
```

```
1    531
0    244
Name: Sex, dtype: int64
```

## One hot encoding on geography column

```
x.shape
```

```
(775, 9)
```

```
sex=pd.get_dummies(x["Sex"],drop_first=True)
```

```
sex
```

| | 1 |
|---|---|
| **0** | 1 |
| **2** | 0 |
| **3** | 0 |
| **4** | 1 |
| **5** | 1 |
| **...** | ... |
| **886** | 1 |
| **887** | 0 |
| **888** | 0 |
| **889** | 1 |
| **890** | 1 |

775 rows × 1 columns

```
#concat
x=pd.concat([x,sex],axis=1)
```

```
x.head()
```

| | Name | Sex | Age | SibSp | Parch | Ticket | Fare | Cabin | Embarked | 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | Braund, Mr. Owen Harris | 1 | 22.000000 | 1 | 0 | A/5 21171 | 7.2500 | B96 B98 | S | 1 |
| **2** | Heikkinen, Miss. Laina | 0 | 26.000000 | 0 | 0 | STON/O2. 3101282 | 7.9250 | B96 B98 | S | 0 |
| **3** | Futrelle, Mrs. Jacques Heath (Lily May Peel) | 0 | 35.000000 | 1 | 0 | 113803 | 53.1000 | C123 | S | 0 |
| **4** | Allen, Mr. William Henry | 1 | 35.000000 | 0 | 0 | 373450 | 8.0500 | B96 B98 | S | 1 |
| **5** | Moran, Mr. James | 1 | 29.699118 | 0 | 0 | 330877 | 8.4583 | B96 B98 | Q | 1 |

```
x.drop(["Sex"],axis=1,inplace=True)
```

```
x.head(10)
```

| | Name | Age | SibSp | Parch | Ticket | Fare | Cabin | Embarked | 1 |
|---|---|---|---|---|---|---|---|---|---|
| **0** | Braund, Mr. Owen Harris | 22.000000 | 1 | 0 | A/5 21171 | 7.2500 | B96 B98 | S | 1 |
| **2** | Heikkinen, Miss. Laina | 26.000000 | 0 | 0 | STON/O2. 3101282 | 7.9250 | B96 B98 | S | 0 |
| **3** | Futrelle, Mrs. Jacques Heath (Lily May Peel) | 35.000000 | 1 | 0 | 113803 | 53.1000 | C123 | S | 0 |
| **4** | Allen, Mr. William Henry | 35.000000 | 0 | 0 | 373450 | 8.0500 | B96 B98 | S | 1 |
| **5** | Moran, Mr. James | 29.699118 | 0 | 0 | 330877 | 8.4583 | B96 B98 | Q | 1 |
| **6** | McCarthy, Mr. Timothy J | 54.000000 | 0 | 0 | 17463 | 51.8625 | E46 | S | 1 |
| **7** | Palsson, Master. Gosta Leonard | 2.000000 | 3 | 1 | 349909 | 21.0750 | B96 B98 | S | 1 |
| **8** | Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg) | 27.000000 | 0 | 2 | 347742 | 11.1333 | B96 B98 | S | 0 |
| **9** | Nasser, Mrs. Nicholas (Adele Achem) | 14.000000 | 1 | 0 | 237736 | 30.0708 | B96 B98 | C | 0 |
| **10** | Sandstrom, Miss. Marguerite Rut | 4.000000 | 1 | 1 | PP 9549 | 16.7000 | G6 | S | 0 |

```
x.shape
```

```
(775, 9)
```

## 7.splitting into training and testing set

```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.3,random_state=0)
```

```
print(x_train.shape)
print(x_test.shape)
print(y_train.shape)
print(y_test.shape)
```

```
(542, 9)
(233, 9)
(542, 0)
(233, 0)
```

```
a=[1,2,3,4,5,6]
b=[1,0,1,5,6,3]

for i in range(5):
    a_train,a_test,b_train,b_test=train_test_split(a,b,test_size=0.3,random_state=100)
    print("with random state",a_train)
```

```
with random state [5, 4, 6, 1]
with random state [5, 4, 6, 1]
with random state [5, 4, 6, 1]
with random state [5, 4, 6, 1]
with random state [5, 4, 6, 1]
```

```
a=[1,2,3,4,5,6]
b=[1,0,1,5,6,3]

for i in range(5):
    a_train,a_test,b_train,b_test=train_test_split(a,b,test_size=0.3)
    print("without random state",a_train)
```

```
without random state [5, 4, 3, 2]
without random state [2, 5, 6, 1]
without random state [6, 1, 3, 5]
without random state [6, 1, 2, 4]
without random state [3, 5, 1, 2]
```

## 8.Feature Scaling

```
scale = StandardScaler()
x[['Age', 'Fare']] = scale.fit_transform(x[['Age', 'Fare']])
```

```
x.head()
```

| | Name | Age | SibSp | Parch | Ticket | Fare | Cabin | Embarked | 1 |
|---|---|---|---|---|---|---|---|---|---|
| **0** | Braund, Mr. Owen Harris | -0.556219 | 1 | 0 | A/5 21171 | -0.779117 | B96 B98 | S | 1 |
| **2** | Heikkinen, Miss. Laina | -0.243027 | 0 | 0 | STON/O2. 3101282 | -0.729373 | B96 B98 | S | 0 |
| **3** | Futrelle, Mrs. Jacques Heath (Lily May Peel) | 0.461654 | 1 | 0 | 113803 | 2.599828 | C123 | S | 0 |
| **4** | Allen, Mr. William Henry | 0.461654 | 0 | 0 | 373450 | -0.720161 | B96 B98 | S | 1 |
| **5** | Moran, Mr. James | 0.046606 | 0 | 0 | 330877 | -0.690071 | B96 B98 | Q | 1 |

```
x_train
```

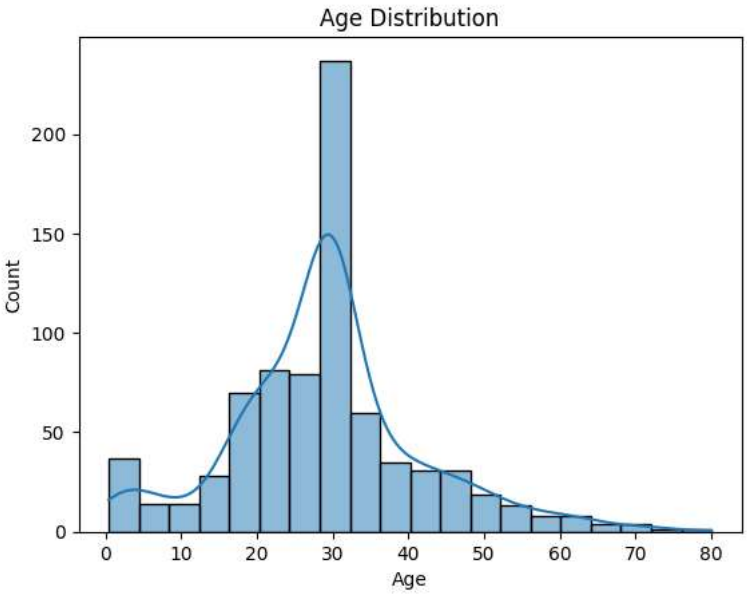
| | Name | Age | SibSp | Parch | Ticket | Fare | Cabin | Embarked | 1 |
|---|---|---|---|---|---|---|---|---|---|
| **654** | Hegarty, Miss. Hanora "Nora" | 18.000000 | 0 | 0 | 365226 | 6.7500 | B96 B98 | Q | 0 |
| **38** | Vander Planke, Miss. Augusta Maria | 18.000000 | 2 | 0 | 345764 | 18.0000 | B96 B98 | S | 0 |
| **646** | Cor, Mr. Liudevit | 19.000000 | 0 | 0 | 349231 | 7.8958 | B96 B98 | S | 1 |
| **727** | Mannion, Miss. Margareth | 29.699118 | 0 | 0 | 36866 | 7.7375 | B96 B98 | Q | 0 |
| **887** | Graham, Miss. Margaret Edith | 19.000000 | 0 | 0 | 112053 | 30.0000 | B42 | S | 0 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **878** | Laleff, Mr. Kristo | 29.699118 | 0 | 0 | 349217 | 7.8958 | B96 B98 | S | 1 |
| **211** | Cameron, Miss. Clear Annie | 35.000000 | 0 | 0 | F.C.C. 13528 | 21.0000 | B96 B98 | S | 0 |
| **725** | Oreskovic, Mr. Luka | 20.000000 | 0 | 0 | 315094 | 8.6625 | B96 B98 | S | 1 |
| **643** | Foo, Mr. Choong | 29.699118 | 0 | 0 | 1601 | 56.4958 | B96 B98 | S | 1 |
| **790** | Keane, Mr. Andrew "Andy" | 29.699118 | 0 | 0 | 12460 | 7.7500 | B96 B98 | Q | 1 |

542 rows × 9 columns

# DATA VISUALIZATION

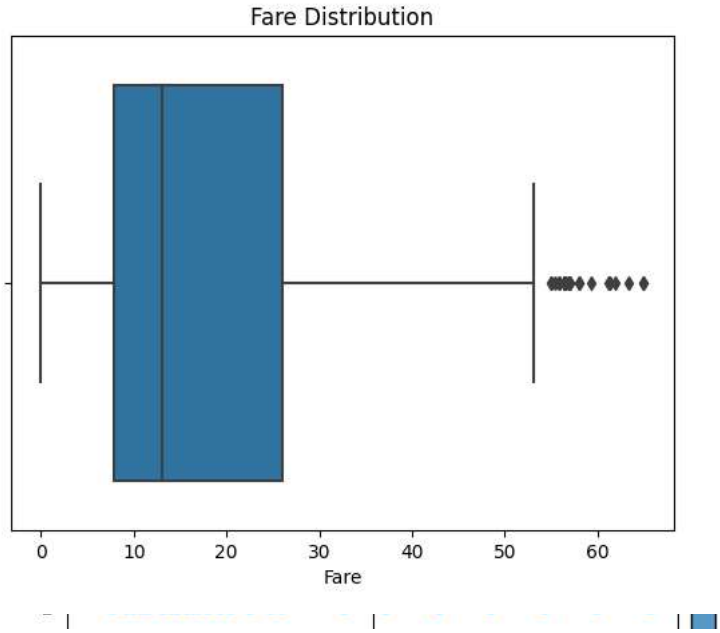
```
sns.countplot(data=dataset, x='Survived')
plt.title('Survival Count')
plt.xlabel('Survived')
plt.ylabel('Count')
plt.show()
```


```
sns.histplot(data=dataset, x='Age', bins=20, kde=True)
plt.title('Age Distribution')
plt.xlabel('Age')
plt.ylabel('Count')
plt.show()
```




```
sns.pairplot(data=dataset[['Fare', 'SibSp', 'Parch']])
plt.title('Pair Plot')
plt.show()
```


```
sns.boxplot(data=dataset, x='Fare')
plt.title('Fare Distribution')
plt.xlabel('Fare')
plt.show()
```




```
corr_matrix = dataset.corr()
sns.heatmap(corr_matrix, annot=True,cmap='coolwarm')
plt.title('Correlation Heatmap')
plt.show()
```

```
<ipython-input-168-6ddef7c4acad>:1: FutureWarning: The default value of numeric_only in DataFrame.corr is deprecated. In a future versio
  corr_matrix = dataset.corr()
```