krishna-chaitanya-assgn-3

September 20, 2023

[36]:
```python
# This Python 3 environment comes with many helpful analytics libraries␣
 ↪installed
# It is defined by the kaggle/python Docker image: https://github.com/kaggle/
 ↪docker-python
# For example, here's several helpful packages to load

import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)

# Input data files are available in the read-only "../input/" directory
# For example, running this (by clicking run or pressing Shift+Enter) will list␣
 ↪all files under the input directory

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))

# You can write up to 20GB to the current directory (/kaggle/working/) that␣
 ↪gets preserved as output when you create a version using "Save & Run All"
# You can also write temporary files to /kaggle/temp/, but they won't be saved␣
 ↪outside of the current session
```

```
/kaggle/input/titanic-dataset/Titanic-Dataset.csv
```

[37]:
```python
# Import the Libraries
# Importing necessary libraries like NumPy, pandas, matplotlib, seaborn, and␣
 ↪scikit-learn for data analysis and machine learning.
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
```

[38]:

```python
# Importing the dataset
# Reading the Titanic dataset into two DataFrames, one for training data and␣
↪the other for test data.
train_data = pd.read_csv("/kaggle/input/titanic-dataset/Titanic-Dataset.csv")
test_data = pd.read_csv("/kaggle/input/titanic-dataset/Titanic-Dataset.csv")

# Print summary information for the train_data DataFrame
print("Summary of train_data:")
print(train_data.info())

# Print summary information for the test_data DataFrame
print("\nSummary of test_data:")
print(test_data.info())

# Display the first few rows of the train_data DataFrame
print("\nFirst few rows of train_data:")
print(train_data.head())

# Display the first few rows of the test_data DataFrame
print("\nFirst few rows of test_data:")
print(test_data.head())
```

```
Summary of train_data:
<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
None

Summary of test_data:
<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
None

First few rows of train_data:
   PassengerId  Survived  Pclass  \
0            1         0       3
1            2         1       1
2            3         1       3
3            4         1       1
4            5         0       3

                                                Name     Sex   Age  SibSp  \
0                            Braund, Mr. Owen Harris    male  22.0      1
1  Cumings, Mrs. John Bradley (Florence Briggs Th…  female  38.0      1
2                             Heikkinen, Miss. Laina  female  26.0      0
3       Futrelle, Mrs. Jacques Heath (Lily May Peel)  female  35.0      1
4                           Allen, Mr. William Henry    male  35.0      0

   Parch            Ticket     Fare Cabin Embarked
0      0         A/5 21171   7.2500   NaN        S
1      0          PC 17599  71.2833   C85        C
2      0  STON/O2. 3101282   7.9250   NaN        S
3      0            113803  53.1000  C123        S
4      0            373450   8.0500   NaN        S

First few rows of test_data:
   PassengerId  Survived  Pclass  \
0            1         0       3
1            2         1       1
2            3         1       3
3            4         1       1
4            5         0       3
```

```
                                                Name     Sex   Age  SibSp  \
0                            Braund, Mr. Owen Harris    male  22.0      1
1  Cumings, Mrs. John Bradley (Florence Briggs Th…  female  38.0      1
2                             Heikkinen, Miss. Laina  female  26.0      0
3       Futrelle, Mrs. Jacques Heath (Lily May Peel)  female  35.0      1
4                           Allen, Mr. William Henry    male  35.0      0

   Parch            Ticket     Fare Cabin Embarked
0      0         A/5 21171   7.2500   NaN        S
1      0          PC 17599  71.2833   C85        C
2      0  STON/O2. 3101282   7.9250   NaN        S
3      0            113803  53.1000  C123        S
4      0            373450   8.0500   NaN        S
```

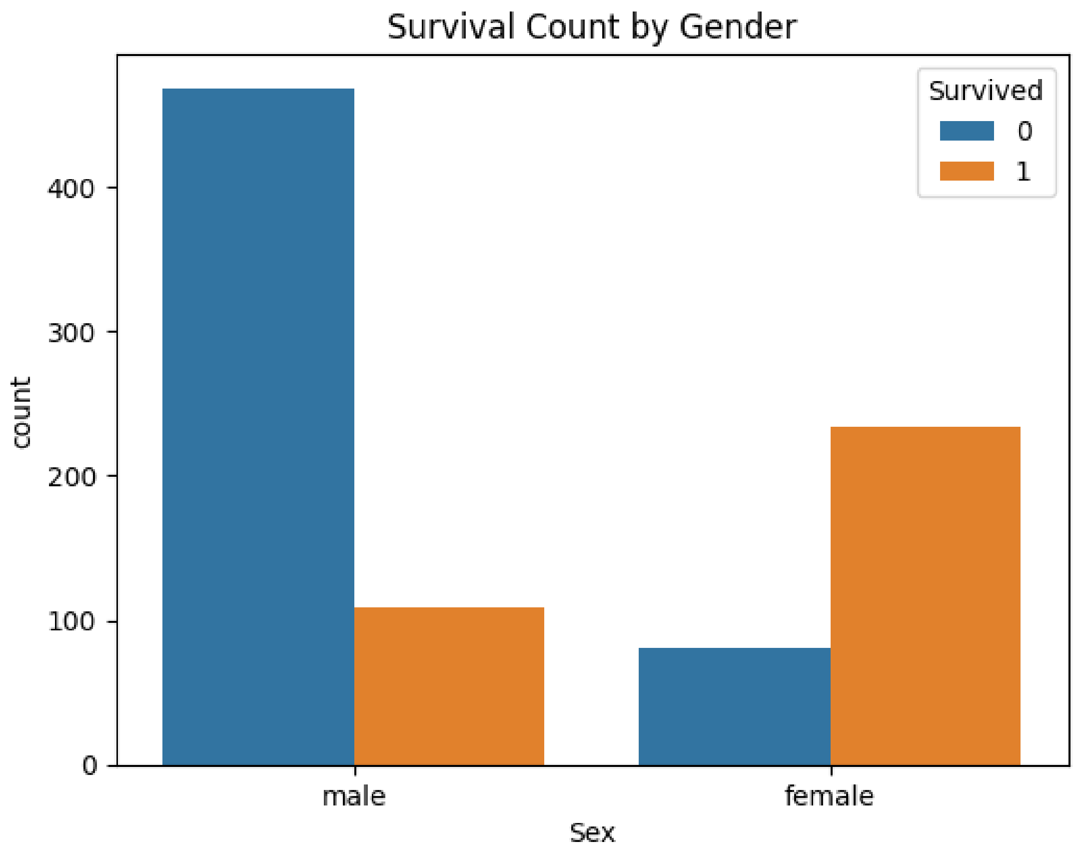
[39]:

```python
# Checking for Null Values
# Displaying the count of missing values in the training and test datasets to
 ↪identify data gaps.
print("Training Data Null Values:")
print(train_data.isnull().sum())

print("\nTest Data Null Values:")
print(test_data.isnull().sum())
```

```
Training Data Null Values:
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

Test Data Null Values:
PassengerId      0
Survived         0
Pclass           0
Name             0
Sex              0
Age            177
SibSp            0
Parch            0
```

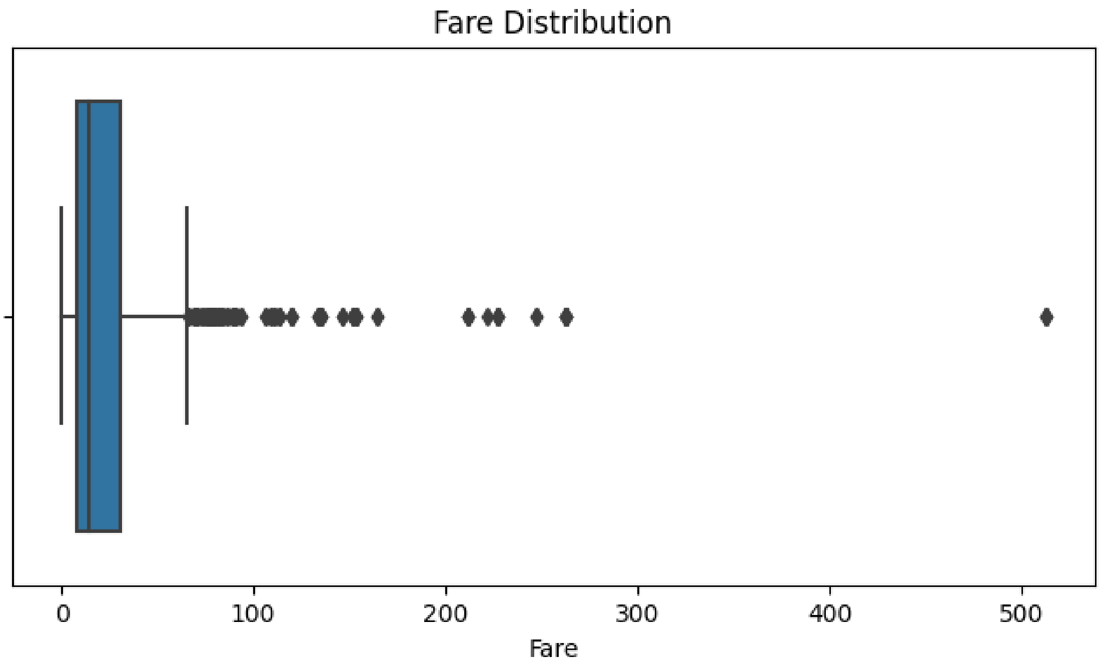
```
Ticket           0
Fare             0
Cabin          687
Embarked         2
dtype: int64
```

[40]:
```
# Data Visualization
# Creating a count plot to visualize the survival count by gender (Sex) and␣
↪displaying a boxplot to detect outliers in the Fare distribution.
sns.countplot(data=train_data, x='Sex', hue='Survived')
plt.title('Survival Count by Gender')
plt.show()
```



[41]:
```
# Outlier Detection (Example: Fare)
# The boxplot provides a visual summary of the distribution of fare prices in␣
↪the Titanic dataset, including information about the median, quartiles, and␣
↪potential outliers. It can help you identify any extreme values or anomalies␣
↪in the fare data.
plt.figure(figsize=(8, 4))
sns.boxplot(data=train_data, x='Fare')
```

```
plt.title('Fare Distribution')
plt.show()
```



[42]:
```
# Splitting Dependent and Independent Variables
# Separating the target variable "Survived" (y) from the input features (X),
↪and applying one-hot encoding to categorical variable "Sex."
# Perform Encoding (Already done with pd.get_dummies())
y = train_data["Survived"]
features = ["Pclass", "Sex", "SibSp", "Parch"]
X = pd.get_dummies(train_data[features])
X_test = pd.get_dummies(test_data[features])

# Print the dependent variable (y)
print("Dependent Variable (y):")
print(y)

# Print the independent variables (X)
print("\nIndependent Variables (X):")
print(X)

# Print the independent variables for the test data (X_test)
print("\nIndependent Variables for Test Data (X_test):")
print(X_test)
```

```
Dependent Variable (y):
```

```
0      0
1      1
2      1
3      1
4      0
      ..
886    0
887    1
888    0
889    1
890    0
Name: Survived, Length: 891, dtype: int64

Independent Variables (X):
     Pclass  SibSp  Parch  Sex_female  Sex_male
0         3      1      0       False      True
1         1      1      0        True     False
2         3      0      0        True     False
3         1      1      0        True     False
4         3      0      0       False      True
..      …    …    …         …       …
886       2      0      0       False      True
887       1      0      0        True     False
888       3      1      2        True     False
889       1      0      0       False      True
890       3      0      0       False      True

[891 rows x 5 columns]

Independent Variables for Test Data (X_test):
     Pclass  SibSp  Parch  Sex_female  Sex_male
0         3      1      0       False      True
1         1      1      0        True     False
2         3      0      0        True     False
3         1      1      0        True     False
4         3      0      0       False      True
..      …    …    …         …       …
886       2      0      0       False      True
887       1      0      0        True     False
888       3      1      2        True     False
889       1      0      0       False      True
890       3      0      0       False      True

[891 rows x 5 columns]
```

[43]:
```
# Feature Scaling
```

```
# Standardizing the feature values using StandardScaler to ensure that␣
↪different features have similar scales.
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)
X_test_scaled = scaler.transform(X_test)
print("X_scaled (Training Data):")
print(X_scaled)

print("\nX_test_scaled (Test Data):")
print(X_test_scaled)
```

```
X_scaled (Training Data):
[[ 0.82737724  0.43279337 -0.47367361 -0.73769513  0.73769513]
 [-1.56610693  0.43279337 -0.47367361  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 …
 [ 0.82737724  0.43279337  2.00893337  1.35557354 -1.35557354]
 [-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]]

X_test_scaled (Test Data):
[[ 0.82737724  0.43279337 -0.47367361 -0.73769513  0.73769513]
 [-1.56610693  0.43279337 -0.47367361  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 …
 [ 0.82737724  0.43279337  2.00893337  1.35557354 -1.35557354]
 [-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]]
```

[44]:
```
# Splitting Data into Train and Test
#  Dividing the dataset into training and validation sets for model training␣
↪and evaluation, respectively, with an 80-20 split and a specified random␣
↪seed.
X_train, X_val, y_train, y_val = train_test_split(X_scaled, y, test_size=0.2,␣
↪random_state=1)
print("X_train:")
print(X_train)

print("\nX_val:")
print(X_val)

print("\ny_train:")
print(y_train)

print("\ny_val:")
print(y_val)
```

```
X_train:
[[ 0.82737724  1.34013193 -0.47367361 -0.73769513  0.73769513]
 [-1.56610693 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [-0.36936484 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 …
 [-0.36936484 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]]

X_val:
[[-1.56610693 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [-0.36936484 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [-0.36936484 -0.4745452   2.00893337  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [-0.36936484 -0.4745452   2.00893337 -0.73769513  0.73769513]
 [-1.56610693  0.43279337 -0.47367361  1.35557354 -1.35557354]
 [-1.56610693  0.43279337 -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724  0.43279337 -0.47367361  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [-0.36936484 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724  2.24747049  2.00893337 -0.73769513  0.73769513]
 [ 0.82737724  0.43279337 -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [-0.36936484  1.34013193  3.25023685  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724  0.43279337 -0.47367361 -0.73769513  0.73769513]
 [-1.56610693 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [-0.36936484 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724  0.43279337 -0.47367361  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [-1.56610693  1.34013193  2.00893337  1.35557354 -1.35557354]
 [-0.36936484 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [-0.36936484 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [-1.56610693 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724  0.43279337  5.73284383  1.35557354 -1.35557354]
 [ 0.82737724  0.43279337 -0.47367361  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724  3.15480905  2.00893337  1.35557354 -1.35557354]
 [-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
```

```
[-1.56610693  0.43279337 -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361  1.35557354 -1.35557354]
[ 0.82737724 -0.4745452   2.00893337  1.35557354 -1.35557354]
[-1.56610693  0.43279337  0.76762988  1.35557354 -1.35557354]
[-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-0.36936484 -0.4745452   2.00893337 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724  4.06214761  2.00893337 -0.73769513  0.73769513]
[-0.36936484 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-0.36936484 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-0.36936484 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-0.36936484 -0.4745452  -0.47367361  1.35557354 -1.35557354]
[-0.36936484 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-0.36936484 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724  0.43279337 -0.47367361  1.35557354 -1.35557354]
[-0.36936484 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724  0.43279337  5.73284383 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361  1.35557354 -1.35557354]
[ 0.82737724  6.7841633   2.00893337  1.35557354 -1.35557354]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-0.36936484 -0.4745452   0.76762988 -0.73769513  0.73769513]
[-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-1.56610693  0.43279337 -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452   2.00893337  1.35557354 -1.35557354]
[ 0.82737724  0.43279337  0.76762988 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452   0.76762988  1.35557354 -1.35557354]
[-0.36936484  0.43279337  0.76762988 -0.73769513  0.73769513]
[ 0.82737724  1.34013193 -0.47367361 -0.73769513  0.73769513]
[ 0.82737724  3.15480905  0.76762988 -0.73769513  0.73769513]
[-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-0.36936484 -0.4745452  -0.47367361  1.35557354 -1.35557354]
[-0.36936484  0.43279337  0.76762988 -0.73769513  0.73769513]
[-1.56610693  0.43279337 -0.47367361  1.35557354 -1.35557354]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-1.56610693 -0.4745452  -0.47367361  1.35557354 -1.35557354]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724  6.7841633   2.00893337 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-0.36936484 -0.4745452  -0.47367361  1.35557354 -1.35557354]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
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[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724  3.15480905  2.00893337  1.35557354 -1.35557354]
[-0.36936484  2.24747049 -0.47367361  1.35557354 -1.35557354]
[-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361  1.35557354 -1.35557354]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361  1.35557354 -1.35557354]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724  0.43279337  0.76762988 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452   0.76762988  1.35557354 -1.35557354]
[-1.56610693 -0.4745452   0.76762988  1.35557354 -1.35557354]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724  3.15480905  0.76762988 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-1.56610693  0.43279337 -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-0.36936484 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724  0.43279337 -0.47367361 -0.73769513  0.73769513]
[-0.36936484 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-0.36936484  0.43279337 -0.47367361 -0.73769513  0.73769513]
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[-0.36936484  0.43279337 -0.47367361  1.35557354 -1.35557354]
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[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[-0.36936484 -0.4745452  -0.47367361 -0.73769513  0.73769513]
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[-1.56610693 -0.4745452  -0.47367361  1.35557354 -1.35557354]
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[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
[ 0.82737724  1.34013193  0.76762988  1.35557354 -1.35557354]
[-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
```

```
 [ 0.82737724  2.24747049 -0.47367361  1.35557354 -1.35557354]
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 [-1.56610693 -0.4745452   2.00893337  1.35557354 -1.35557354]
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 [ 0.82737724  0.43279337 -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [-1.56610693  0.43279337  2.00893337  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [-1.56610693  0.43279337  2.00893337  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724  0.43279337 -0.47367361  1.35557354 -1.35557354]
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 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452   5.73284383  1.35557354 -1.35557354]
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 [ 0.82737724 -0.4745452   0.76762988  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724  3.15480905  0.76762988 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [-0.36936484  0.43279337 -0.47367361  1.35557354 -1.35557354]
 [-0.36936484 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [-0.36936484  0.43279337 -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724  1.34013193 -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724  0.43279337 -0.47367361  1.35557354 -1.35557354]
 [-0.36936484  1.34013193  0.76762988  1.35557354 -1.35557354]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [-1.56610693 -0.4745452   2.00893337 -0.73769513  0.73769513]
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 [ 0.82737724  0.43279337  0.76762988 -0.73769513  0.73769513]
 [-1.56610693 -0.4745452  -0.47367361  1.35557354 -1.35557354]
 [-1.56610693 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724 -0.4745452  -0.47367361 -0.73769513  0.73769513]
 [ 0.82737724  1.34013193  0.76762988  1.35557354 -1.35557354]]

y_train:
301    1
```

```
309    1
516    1
120    0
570    1
      ..
715    0
767    0
72     0
235    0
37     0
Name: Survived, Length: 712, dtype: int64

y_val:
862    1
223    0
84     1
680    0
535    1
      ..
796    1
815    0
629    0
421    0
448    1
Name: Survived, Length: 179, dtype: int64
```

[ ]:

```

```