Sheet

Regression Model in Keras

Building a Regression Model using Keras Library

Classification Model Using dataset from **Heart Data UCI**

Our Goal is to build a classification model to predict wheather a patient is likely or unlikely to have heart disease.

Importing Libraries and Dataset

```python
from io import StringIO
import itertools
import warnings
warnings.filterwarnings('ignore')

import pandas as pd
import numpy as np
import statistics as stats

import pydotplus

from sklearn import preprocessing
from sklearn import tree
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression
from sklearn.tree import DecisionTreeClassifier
from sklearn.metrics import mean_squared_error
from sklearn.metrics import f1_score
from sklearn.metrics import classification_report
from sklearn.metrics import confusion_matrix

import matplotlib.pyplot as plt
import matplotlib.gridspec as gd
import matplotlib.image as mpimg
import seaborn as sns
%matplotlib inline
```

```python
import tensorflow
print("TensorFlow = ", tensorflow.__version__)

import keras
print("keras = ", keras.__version__)

from keras.models import Sequential
from keras.layers import Dense
```

```
TensorFlow =  2.2.0
keras =  2.4.3
```

```python
df = pd.read_csv("heart.csv")
df.head()
```

	age	sex	cp	trestbps	chol	fbs	restecg	thalach	exang	oldpeak	slope	ca	thal	target
0	63	1	3	145	233	1	0	150	0	2.3	0	0	1	1
1	37	1	2	130	250	0	1	187	0	3.5	0	0	2	1
2	41	0	1	130	204	0	0	172	0	1.4	2	0	2	1
3	56	1	1	120	236	0	1	178	0	0.8	2	0	2	1
4	57	0	0	120	354	0	1	163	1	0.6	2	0	2	1

```
df.describe()
```

	age	sex	cp	trestbps	chol	fbs	restecg	thalach	exang	oldpe
count	303.000000	303.000000	303.000000	303.000000	303.000000	303.000000	303.000000	303.000000	303.000000	303.0
mean	54.366337	0.683168	0.966997	131.623762	246.264026	0.148515	0.528053	149.646865	0.326733	1.039
std	9.082101	0.466011	1.032052	17.538143	51.830751	0.356198	0.525860	22.905161	0.469794	1.161
min	29.000000	0.000000	0.000000	94.000000	126.000000	0.000000	0.000000	71.000000	0.000000	0.000
25%	47.500000	0.000000	0.000000	120.000000	211.000000	0.000000	0.000000	133.500000	0.000000	0.000
50%	55.000000	1.000000	1.000000	130.000000	240.000000	0.000000	1.000000	153.000000	0.000000	0.800
75%	61.000000	1.000000	2.000000	140.000000	274.500000	0.000000	1.000000	166.000000	1.000000	1.600
max	77.000000	1.000000	3.000000	200.000000	564.000000	1.000000	2.000000	202.000000	1.000000	6.200

Data Contains:

index	feature	description	datatype
1	**age**	in years	continuous
2	**sex**	1 = male and 0 = female	discrete
3	**cp**	chest pain type	discrete
4	**trestbps**	resting blood pressure (in mmHg on admission to the hospital)	continuous
5	**chol**	serum cholestoral in mg/dl	continuous
6	**fbs**	fasting blood sugar > 120 mg/dl (1 = true and 0 = false)	discrete
7	**restecg**	resting electrocardiographic results	discrete
8	**thalach**	maximum heart rate achieved	continuous
9	**exang**	exercise induced angina (1 = True and 0 = False)	discrete
10	**oldpeak**	ST depression induced by exercise relative to rest	continuous
11	**slope**	the slope of the peak exercise ST segment	discrete
12	**ca**	number of major vessels (0-3) colored by flourosopy	discrete
13	**thal**	(3 = normal; 6 = fixed defect; 7 = reversable defect)	discrete
14	**target**	with disease = 1 and without disease = 0	discrete

```
df.isnull().sum()
```

age   0

```
sex         0
cp          0
trestbps    0
chol        0
fbs         0
restecg     0
thalach     0
exang       0
oldpeak     0
slope       0
ca          0
thal        0
target      0
dtype: int64
```

The dataframe is clean and ready to be explored.

Data Exploration

```python
# Heart Disease Distribution

X1 = [round(len(df[df.target == 0])*100/len(df.target), 2), round(len(df[df.target == 1])*100/len(df.
Y1 = ['Without Heart Disease', 'With Heart Disease']
plot1 = sns.barplot(x = Y1, y = X1, palette = 'mako_r')
sns.set_theme(style = "white")
for bar in plot1.patches:
    plot1.annotate(format(bar.get_height(), '.2f'), (bar.get_x() + bar.get_width() / 2, bar.get_heigh
                   ha = 'center', va = 'center', size = 12, xytext=(0, 8), textcoords='offset points'
sns.despine(left=True, bottom=True)
plt.tick_params(labelleft=False, left=False)
plt.show()
```
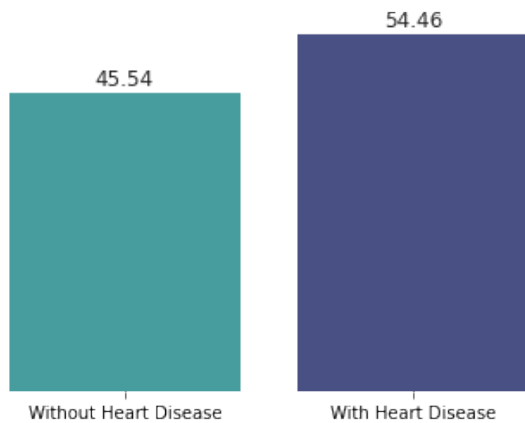

Observation:

Dataset contains a fairly balanced set between patient with and without heart disease

```python
# Heatmap

sns.set_theme(style = "white")

corr = df.corr()       # Correlation matrix
mask = np.triu(np.ones_like(corr, dtype = bool))       # Generate mask for upper triangle

f, ax = plt.subplots(figsize = (20, 20))       # Matplotlib figure
cmap = sns.diverging_palette(250, 0, as_cmap = True)
sns.heatmap(corr, mask = mask, cmap = cmap, vmax = .3, center = 0,
            square = True, linewidths = .5, cbar_kws = {"shrink": .5})
plt.show()
```
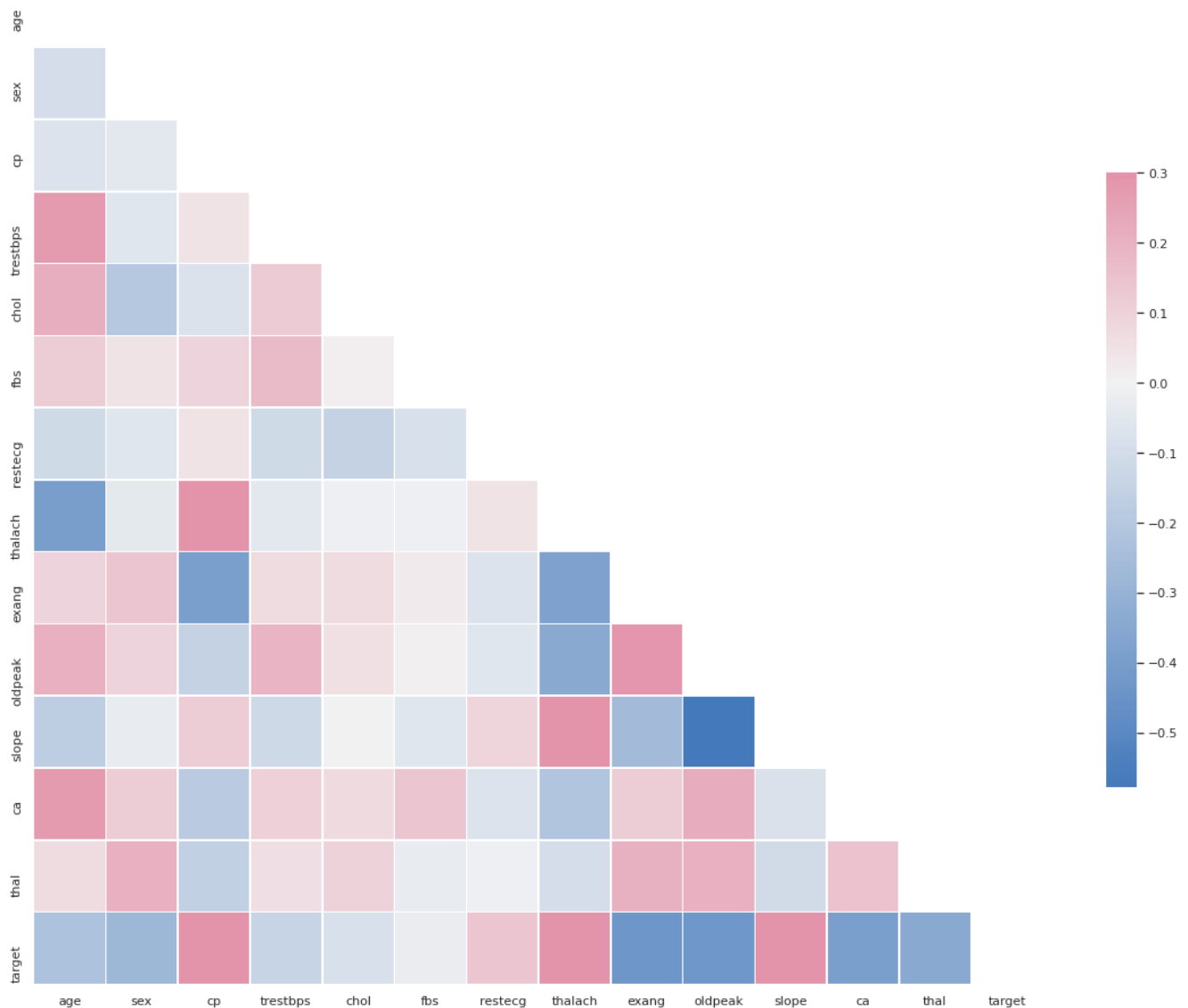

Observation:

1. 'fbs' and 'target' has least correlation.
2. 'thalach', 'exang', 'oldpeak' has more correlation with 'target'.

Numerical Data vs Target

```
# Numerical Data Distribution

viz = df[["age", "trestbps", "chol", "thalach", "oldpeak", "target"]]
g = sns.PairGrid(viz, hue = "target")
g = g.map_diag(sns.histplot)
g = g.map_lower(sns.scatterplot)
g = g.map_upper(sns.kdeplot)
```



```
# Numerical Data Distribution

viz = df[["age", "trestbps", "chol", "thalach", "oldpeak", "target"]]
g = sns.PairGrid(viz, hue = "target")
```
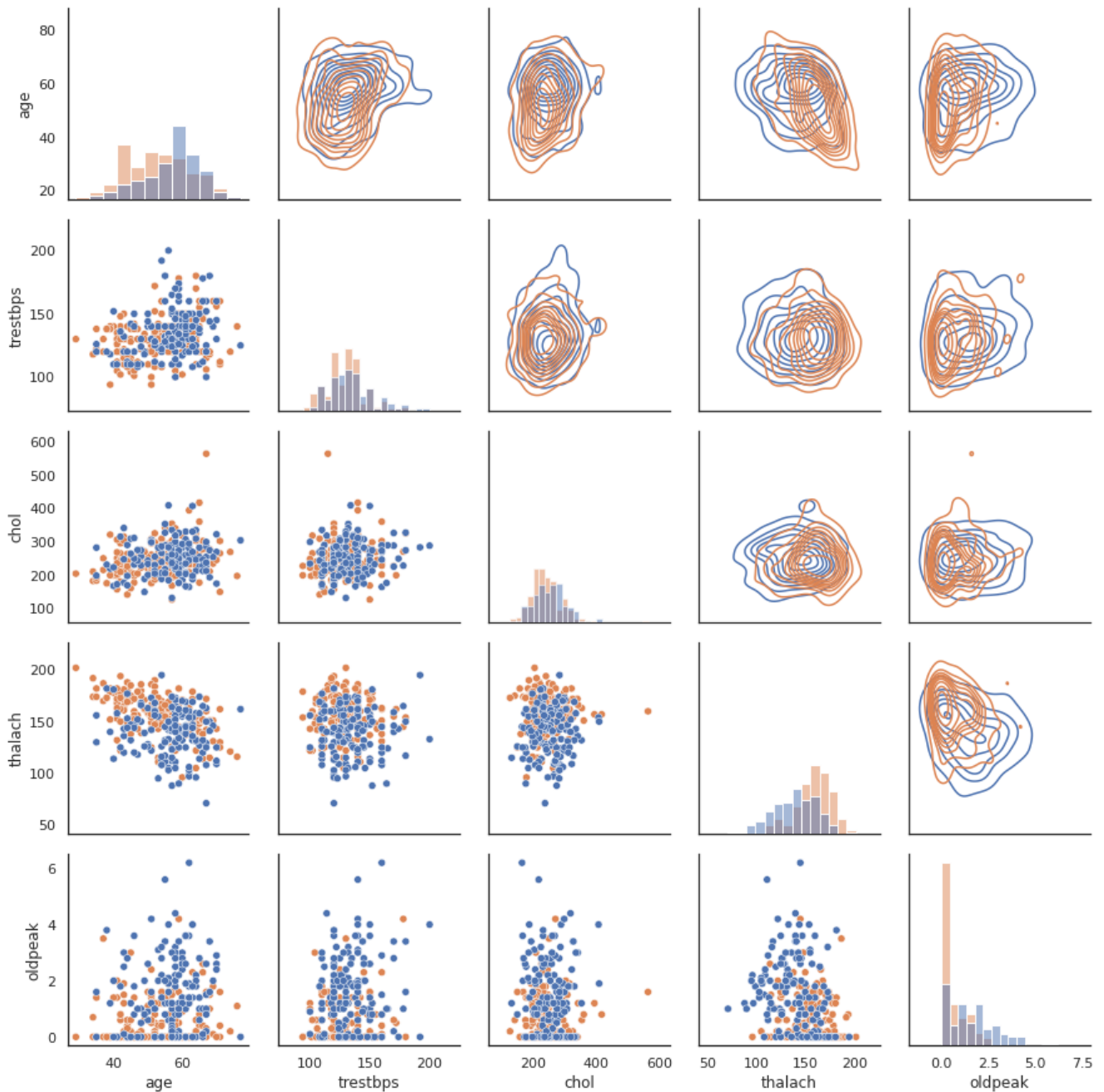
```python
# Boxplot of Numerical features

fig = plt.figure(constrained_layout = True, figsize = (18, 12))
grid = gd.GridSpec(ncols = 4, nrows = 3, figure = fig)
sns.set_theme(style = "darkgrid")

ax1 = fig.add_subplot(grid[0, :2])
ax1.set_title('Resting Blood Pressure Distribution')
sns.boxplot(x = 'target', y = 'trestbps', data = df, palette = ['#342D7E', '#E67451'], ax = ax1)
sns.swarmplot(x = 'target', y = 'trestbps', data = df, palette = ['#E67451', '#342D7E'], ax = ax1)

ax2 = fig.add_subplot(grid[0, 2:])
ax2.set_title('Cholesterol Distribution')
sns.boxplot(x = 'target', y = 'chol', data = df, palette = ['#342D7E', '#E67451'], ax = ax2)
sns.swarmplot(x ='target', y = 'chol', data = df, palette = ['#E67451', '#342D7E'], ax = ax2)

ax3 = fig.add_subplot(grid[1, :2])
ax3.set_title('Max Heart Rate Distribution')
sns.boxplot(x = 'target', y = 'thalach', data = df, palette = ['#342D7E', '#E67451'], ax = ax3)
sns.swarmplot(x = 'target', y = 'thalach', data = df, palette = ['#E67451', '#342D7E'], ax=ax3)

ax4 = fig.add_subplot(grid[1, 2:])
ax4.set_title('ST Depression Distribution')
sns.boxplot(x = 'target', y = 'oldpeak', data = df, palette = ['#342D7E', '#E67451'], ax = ax4)
sns.swarmplot(x = 'target', y = 'oldpeak', data = df, palette = ['#E67451', '#342D7E'], ax = ax4)

ax5 = fig.add_subplot(grid[2, :])
ax5.set_title('Age Distribution')
sns.boxplot(x = 'target', y = 'age', data = df, palette = ['#342D7E', '#E67451'], ax = ax5)
sns.swarmplot(x = 'target', y = 'age', data = df, palette = ['#E67451', '#342D7E'], ax = ax5)

plt.show()
```
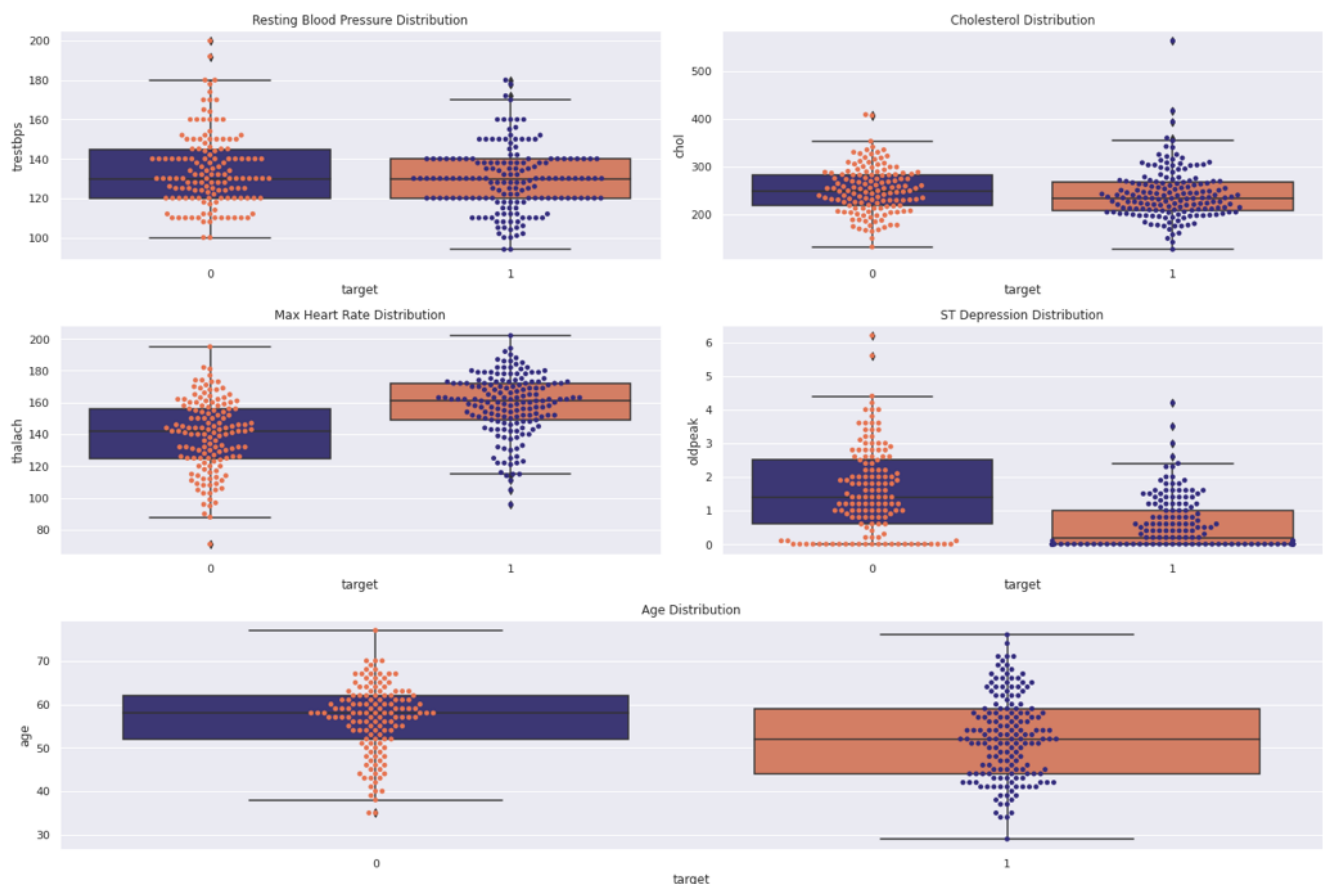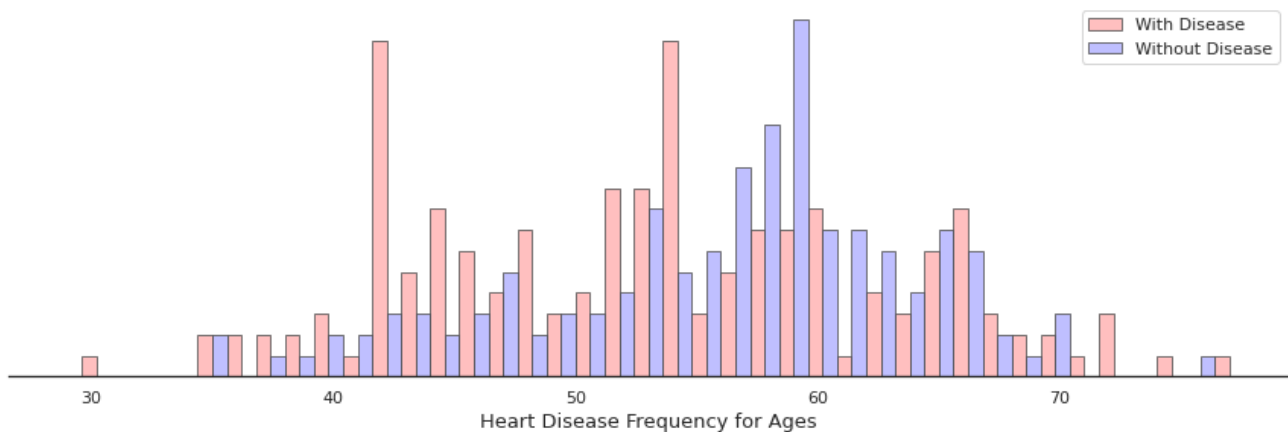

Observation:

1. Having higher resting blood pressure is likely to cause heart disease.
2. Higher cholesterol leads to more heart disease.
3. Contrary to conventional wisdom, higher maximum heart rate during exercise is less likely to cause heart disease.
4. Heart disease likelihood increases with ST depression levels.
5. Older patients are more likely to have heart disease.

```python
# Age Distribution

fig = plt.figure(constrained_layout = True, figsize = (12, 4))
sns.set_theme(style = "white")
sns.histplot(x = 'age', data = df, hue = 'target',bins = 40, multiple = 'dodge', palette = 'bwr', edg
sns.despine(left = True)
plt.tick_params(labelleft=False, left=False)
plt.legend(["With Disease", "Without Disease"])
plt.ylabel(" ")
plt.xlabel("Heart Disease Frequency for Ages", fontsize = 13)
plt.show()
```


Observation:

Patients in their 40s are shown to becoming more prone to heart disease; whereas patients in their late 50s tends to be more resilient to disease. Although the model may require more data to predict accurately.

```python
fig = plt.figure(constrained_layout = True, figsize = (12, 5))
grid = gd.GridSpec(ncols = 2, nrows = 1, figure = fig)
sns.set_theme(style = "dark")

ax1 = fig.add_subplot(grid[0, :1])
sns.despine(fig, left = True, bottom = True, ax = ax1)
sns.scatterplot(x = "age", y = "thalach", hue = "target", linewidth = 0, sizes = (1, 8), data = df, a
plt.legend(["With Disease", "Without Disease"])
plt.xlabel("Age", fontsize = 12)
plt.ylabel("Maximum Heart Rate", fontsize = 12)
plt.tick_params(labelleft = False, left = False)
plt.tick_params(labelbottom = False, bottom = False)

ax2 = fig.add_subplot(grid[0, 1:])
sns.despine(fig, left = True, bottom = True)
sns.kdeplot(x = 'age', y = 'thalach', hue = 'target', data = df, ax = ax2)
plt.xlabel("Age", fontsize = 12)
plt.ylabel("Maximum Heart Rate", fontsize = 12)
plt.tick_params(labelleft = False, left = False)
plt.tick_params(labelbottom = False, bottom = False)

plt.show()
```
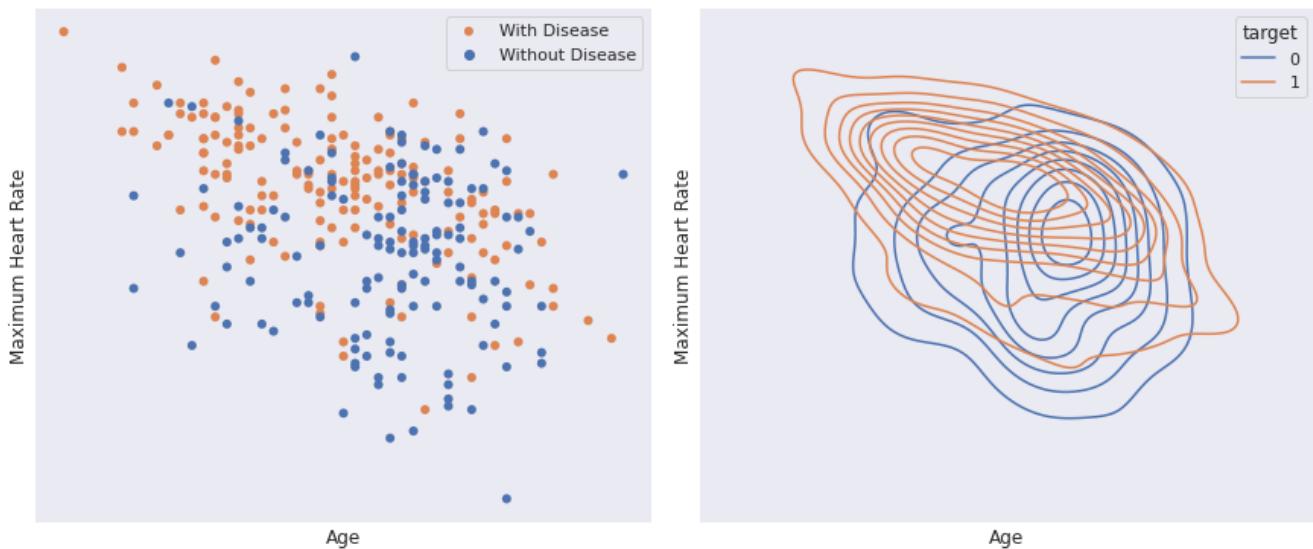
Observation:

Age and Maximum Heart Rate could be two major contributor in classifying heart diseases.

Note: This also suggests that a classification regression can be implemented for 'Age' and 'Max Heart Rate' feature.

Categorical Data vs Target

```python
def plotcategoricaldata(X, Y, m, n, text):
    fig = plt.figure(constrained_layout = True, figsize = (3 + n, 5))
    grid = gd.GridSpec(ncols = 2, nrows = 1, figure = fig)
    sns.set_theme(style = "dark")

    ax1 = fig.add_subplot(grid[0, :1])
    sns.despine(fig, left = True, bottom = True, ax = ax1)
    plot = sns.barplot(x = Y, y = X, palette = 'mako_r')
    for bar in plot.patches:
        plot.annotate(format(bar.get_height(), '.2f'), (bar.get_x() + bar.get_width() / 2, bar.get_he
                      ha = 'center', va = 'center', size = 12, xytext = (0, 8), textcoords = 'offse
    sns.despine(left = True, bottom = True)
    plt.tick_params(labelleft = False, left = False)
    plt.ylim([0, 100])

    ax2 = fig.add_subplot(grid[0, 1:])
    sns.despine(fig, left = True, bottom = True, ax = ax2)
    sns.histplot(x = m, data = df, hue = 'target', bins = n, multiple = 'fill', palette = 'mako_r', a
    plt.tick_params(labelleft = False, left = False)
    plt.tick_params(labelbottom = False, bottom = False)
    plt.legend(["With Disease", "Without Disease"])
    plt.ylabel(" ")
    plt.xlabel(text, fontsize = 13)

    plt.show()
```

```python
# Sex Distribution

X = [round(len(df[df.sex == 0])*100/len(df.sex), 2),
     round(len(df[df.sex == 1])*100/len(df.sex), 2)]
Y = ['female', 'male']
m = 'sex'
n = 3
text = 'female                            male\nHeart Disease Frequency for Sex'
plotcategoricaldata(X, Y, m, n, text)
```
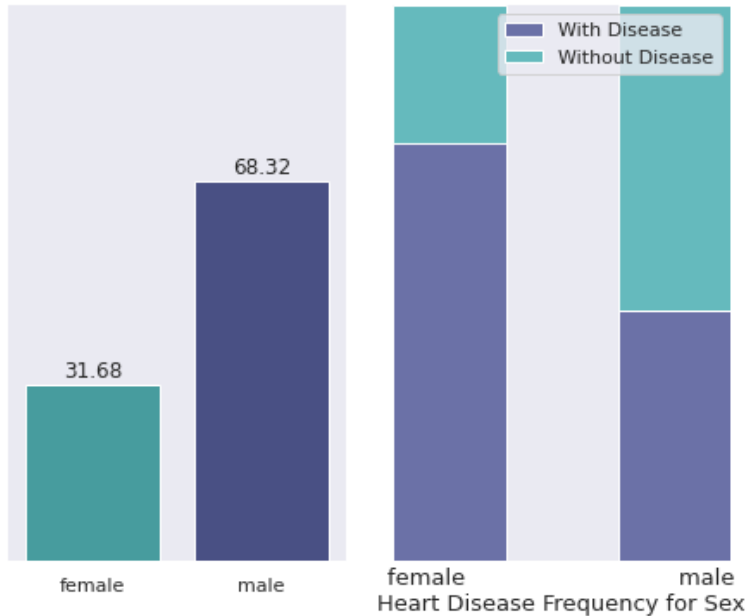

Observation:

The dataset consists of more male patients than female. If sex feature is major contributor to target, then we may have to use imbalanced metrics for analysis.

Female are more prone to heart diseases. Hence, sex is more likely to be a major contributor.

```python
# Chest Pain Type Distribution

X = [round(len(df[df.cp == 0])*100/len(df.cp), 2),
     round(len(df[df.cp == 1])*100/len(df.cp), 2),
     round(len(df[df.cp == 2])*100/len(df.cp), 2),
     round(len(df[df.cp == 3])*100/len(df.cp), 2)]
Y = ['Type 0', 'Type 1', 'Type 2', 'Type 3']
m = 'cp'
n = 7
text = 'Type 0              Type 1              Type 2              Type 3\nHeart Disease Frequ
plotcategoricaldata(X, Y, m, n, text)
```

Heart Disease Frequency for Chest Pain Type
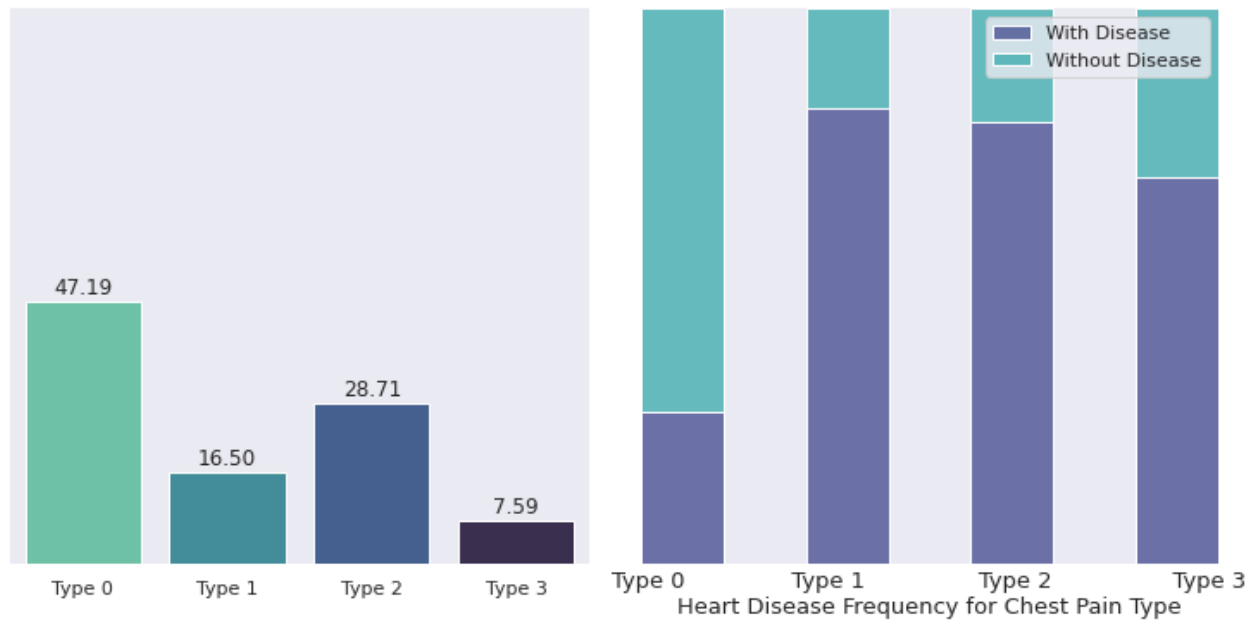
Observation:

~50% of dataset is Type 0 patients but Type 3 patients fills only 8% of dataset.

People with chest pain type of 0 are less likely to heart diseases. People with chest pain type 1, 2 and 3 are more likely to contract disease.

```
# Fasting Blood Sugar Distribution

X = [round(len(df[df.fbs == 0])*100/len(df.fbs), 2),
     round(len(df[df.fbs == 1])*100/len(df.fbs), 2)]
Y = ['False', 'True']
m = 'fbs'
n = 3
text = 'False            True\nHeart Disease Frequency for Fasting Blood Sugar\nfbs > 120mg/dl (0
plotcategoricaldata(X, Y, m, n, text)
```


Heart Disease Frequency for Fasting Blood Sugar
fbs > 120mg/dl (0 if False, 1 if True)
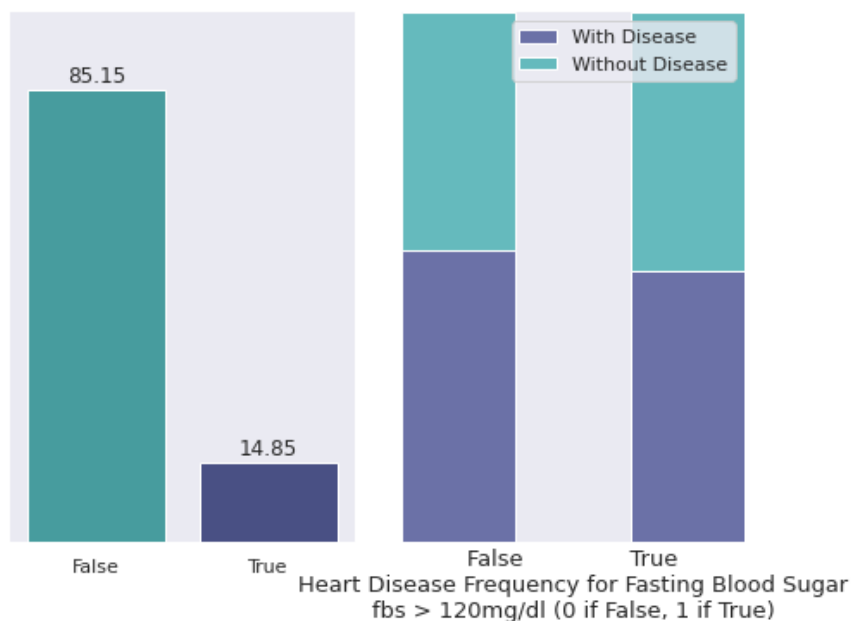
Observation:

Fasting Blood Sugar > 120 mg/dl is slightly less likely to get disease.

```python
# Resting Electrocardiographic Distribution

X = [round(len(df[df.restecg == 0])*100/len(df.restecg), 2),
     round(len(df[df.restecg == 1])*100/len(df.restecg), 2),
     round(len(df[df.restecg == 2])*100/len(df.restecg), 2)]
Y = ['0', '1', '2']
m = 'restecg'
n = 5
text = '0                        1                      2\nHeart Disease Frequency for Rest EC
plotcategoricaldata(X, Y, m, n, text)
```
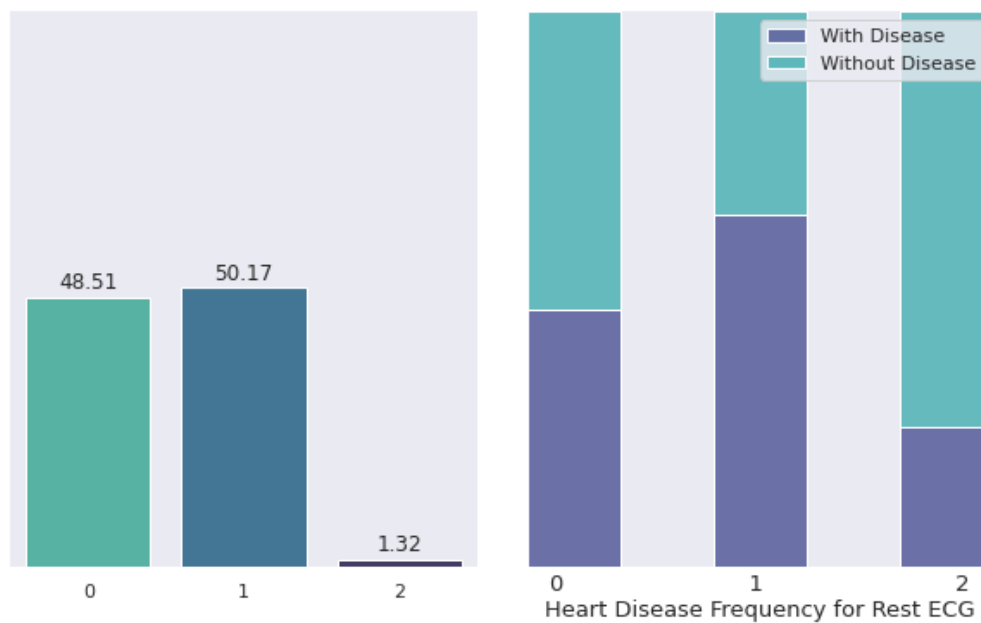

Observations:

Patients with type 1 Rest ECG are more likely to have heart disease.

```python
# Exercise Induced Angina Distribution

X = [round(len(df[df.exang == 0])*100/len(df.exang), 2),
     round(len(df[df.exang == 1])*100/len(df.exang), 2)]
Y = ['0', '1']
m = 'exang'
n = 3
text = '0                   1\nFrequency for Exercise Induced Angina'
plotcategoricaldata(X, Y, m, n, text)
```
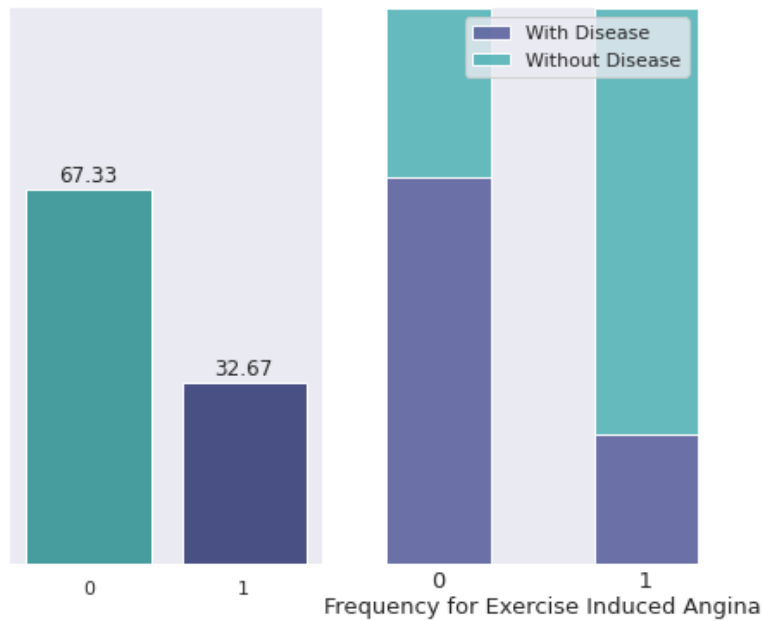
Observations:

Patients with exercise induced angina are less likely to have heart disease.

```
# Slope of ST egment DIstribution

X = [round(len(df[df.slope == 0])*100/len(df.slope), 2),
     round(len(df[df.slope == 1])*100/len(df.slope), 2),
     round(len(df[df.slope == 2])*100/len(df.slope), 2)]
Y = ['0', '1', '2']
m = 'slope'
n = 5
text = '0                    1                        2\nHeart Disease Frequency for Slope of Peak ST
plotcategoricaldata(X, Y, m, n, text)
```
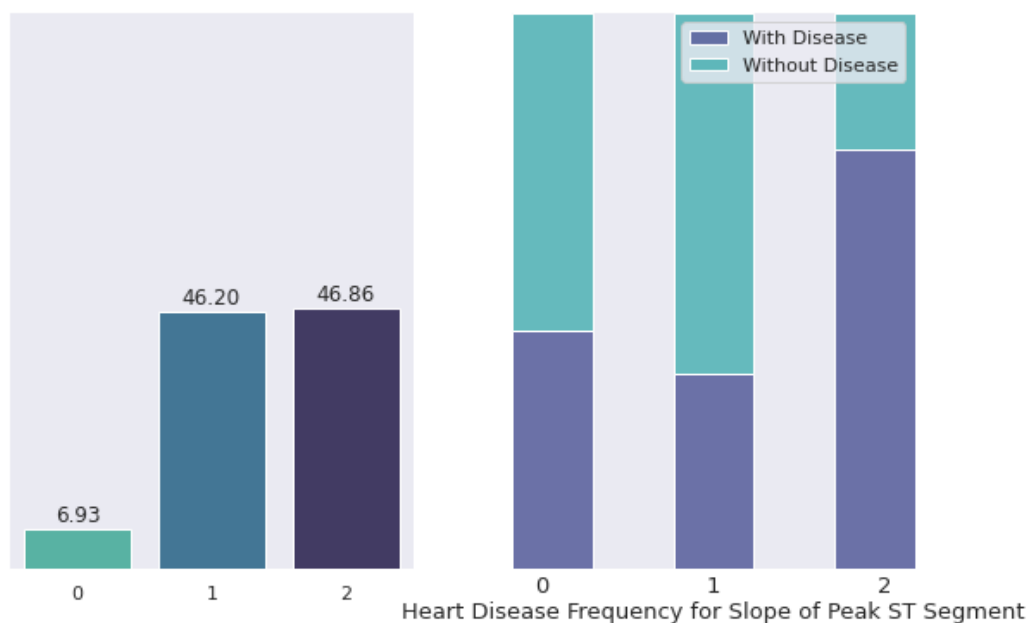

Observation:

Slope of the Peak Exercise ST Segmant is major contributor in disease.

```python
# Number of Major Vessels Distribution

X = [round(len(df[df.ca == 0])*100/len(df.ca), 2),
     round(len(df[df.ca == 1])*100/len(df.ca), 2),
     round(len(df[df.ca == 2])*100/len(df.ca), 2),
     round(len(df[df.ca == 3])*100/len(df.ca), 2),
     round(len(df[df.ca == 4])*100/len(df.ca), 2)]
Y = ['0', '1', '2', '3', '4']
m = 'ca'
n = 9
text = '0                    1                    2                    3'
plotcategoricaldata(X, Y, m, n, text)
```
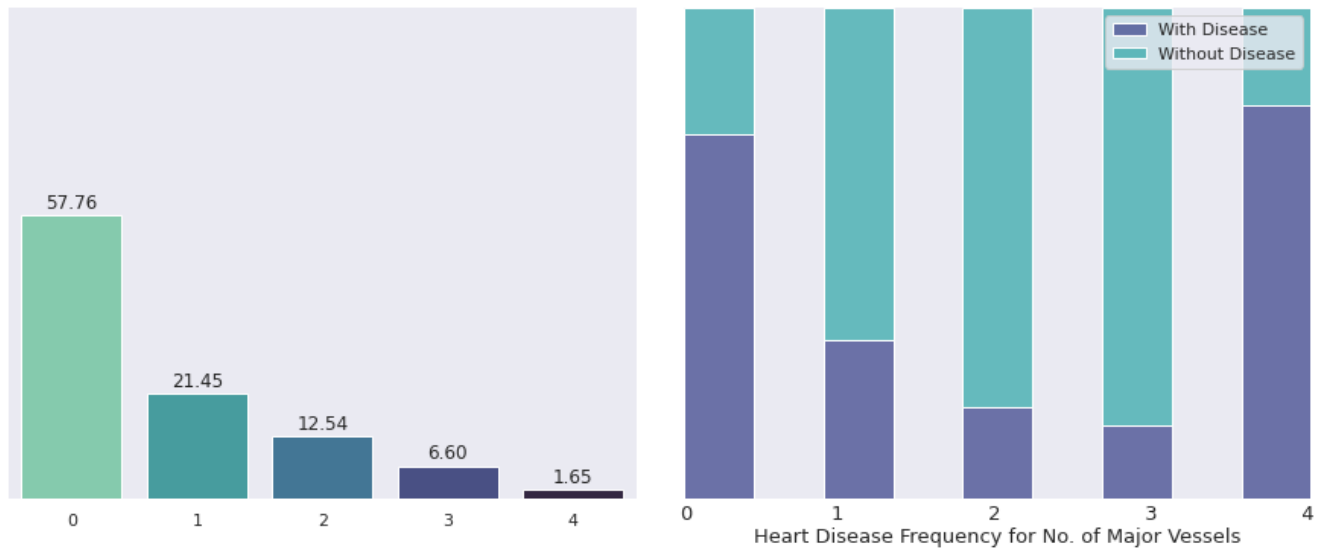

Observation:

Having 1, 2 or 3 major vessels leads less heart disease.

Model Building

Preprocessing

```python
y = df.target.values
X = df.drop(['target'], axis = 1)

X = preprocessing.StandardScaler().fit(X).transform(X)

x_train, x_test, y_train, y_test = train_test_split( X, y, test_size = 0.2, random_state = 4)

print ('Train set:', x_train.shape,  y_train.shape)
print ('Test set:', x_test.shape,  y_test.shape)
```

```
Train set: (242, 13) (242,)
Test set: (61, 13) (61,)
```

Logistic Regression

```python
# Fit Logistic Regression Object
LR = LogisticRegression(C = 0.01, solver = 'liblinear').fit(x_train,y_train)
print(LR)
```

LogisticRegression(C=0.01, solver='liblinear')

```python
# Predict Model
yhat_LR = LR.predict(x_test)
yhat_LR
```

array([1, 0, 1, 1, 1, 0, 0, 1, 1, 1, 1, 1, 1, 0, 1, 0, 1, 1, 0, 1, 1, 1,
*   0, 1, 1, 0, 0, 1, 1, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 1,*
*   1, 1, 0, 0, 0, 1, 0, 1, 0, 0, 1, 1, 1, 1, 0, 0, 1])*

Evaluation

```python
# Mean Squared Error
y_1 = mean_squared_error(y_test, yhat_LR)

print("\nMean Squared Error of Logistic Regression Model = ", y_1)
```

Mean Squared Error of Logistic Regression Model = 0.11475409836065574

```python
def plot_confusion_matrix(cm, classes, normalize = False, title = 'Confusion matrix', cmap = plt.cm.B

    if normalize:
        cm = cm.astype('float') / cm.sum(axis = 1)[:, np.newaxis]
        print("Normalized confusion matrix")
    else:
        print('Confusion matrix, without normalization')

    print(cm)

    plt.imshow(cm, interpolation = 'nearest', cmap = cmap)
    plt.title(title)
    plt.colorbar()
    tick_marks = np.arange(len(classes))
    plt.xticks(tick_marks, classes, rotation = 45)
    plt.yticks(tick_marks, classes)

    fmt = '.2f' if normalize else 'd'
    thresh = cm.max() / 2.
    for i, j in itertools.product(range(cm.shape[0]), range(cm.shape[1])):
        plt.text(j, i, format(cm[i, j], fmt),
                 horizontalalignment = "center",
                 color = "white" if cm[i, j] > thresh else "black")

    plt.tight_layout()
    plt.ylabel('True label')
    plt.xlabel('Predicted label')
```

```python
# Compute confusion matrix
cnf_matrix_LR = confusion_matrix(y_test, yhat_LR, labels = [1,0])
np.set_printoptions(precision = 2)

# Plot non-normalized confusion matrix
plt.figure()
plot_confusion_matrix(cnf_matrix_LR, classes = ['heart disease', 'without heart disease'],
                      normalize = False,  title = 'Confusion matrix for Logistic Regression')

print (classification_report(y_test, yhat_LR))
```

```
Confusion matrix, without normalization
[[33  3]
 [ 4 21]]
              precision    recall  f1-score   support

           0       0.88      0.84      0.86        25
           1       0.89      0.92      0.90        36

    accuracy                           0.89        61
   macro avg       0.88      0.88      0.88        61
weighted avg       0.88      0.89      0.88        61
```


Confusion matrix for Logistic Regression
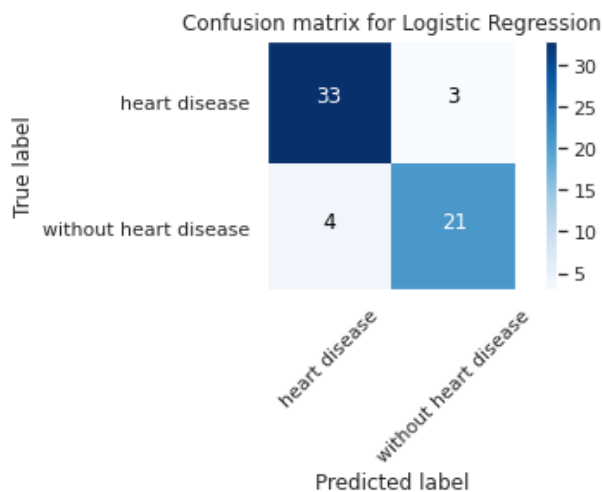
Dicision Tree

```python
# Fit Decision Tree Object
Tree = DecisionTreeClassifier(criterion="entropy", max_depth = 4)
Tree

Tree.fit(x_train, y_train)
```

```
DecisionTreeClassifier(criterion='entropy', max_depth=4)
```

```python
# Model Predict
predTree = Tree.predict(x_test)
predTree
```

```
array([0, 0, 1, 1, 1, 0, 1, 1, 1, 1, 1, 1, 1, 0, 1, 0, 1, 1, 0, 1, 1, 0,
       0, 1, 1, 0, 0, 1, 1, 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 1,
       1, 1, 0, 0, 1, 1, 0, 1, 1, 0, 1, 1, 1, 1, 0, 0, 1])
```

Evaluation

```python
# Mean Squared Error
y_2 = mean_squared_error(y_test, predTree)

print("\nMean Squared Error of Decision Tree Model = ", y_2)
```

Mean Squared Error of Decision Tree Model = 0.14754098360655737

```python
# Compute confusion matrix
cnf_matrix_tree = confusion_matrix(y_test, predTree, labels = [1,0])
np.set_printoptions(precision = 2)

# Plot non-normalized confusion matrix
plt.figure()
plot_confusion_matrix(cnf_matrix_tree, classes = ['heart disease', 'without heart disease'],
                      normalize = False,  title = 'Confusion matrix for Decision Tree')

print (classification_report(y_test, predTree))
```

```
Confusion matrix, without normalization
[[33  3]
 [ 6 19]]
              precision    recall  f1-score   support

           0       0.86      0.76      0.81        25
           1       0.85      0.92      0.88        36

    accuracy                           0.85        61
   macro avg       0.85      0.84      0.84        61
weighted avg       0.85      0.85      0.85        61
```


Confusion matrix for Decision Tree
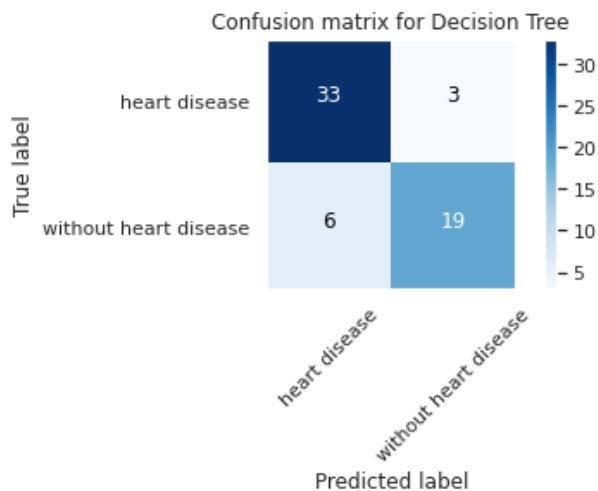
Visualisation

```
dot_data = StringIO()
filename = "tree.png"
featureNames = df.columns[0:13]
targetNames = df["target"].unique().tolist()

out = tree.export_graphviz(Tree,feature_names = featureNames, out_file = dot_data,
                           class_names =  (["With Disease", "Without Disease"]), filled = True,
                           special_characters = True, rotate = False)

graph = pydotplus.graph_from_dot_data(dot_data.getvalue())
graph.write_png(filename)
img = mpimg.imread(filename)
plt.figure(figsize = (200, 400))
plt.imshow(img, interpolation = 'nearest')
plt.show()
```

InvocationException: GraphViz's executables not found

Neural Network Model Building

Building Neural Network with Keras

In this model we will implement the entire dataset in a Neural Network to target heart disease. The model contains:

1. Feature vector with 22 units
2. Input layer with 10 nodes
3. 1 hidden layer with 10 nodes
4. 1 output node

The model will use **'relu'** activator; **'adam'** optimizer and **'mean_squared_error'** loss function in 100 epochs.

```
model = Sequential()
model.add(Dense(10, activation = 'relu', input_shape = (x_train.shape[1],)))
model.add(Dense(10, activation = 'relu'))
model.add(Dense(1, activation = 'sigmoid'))

model.compile(optimizer = 'adam', loss = 'mean_squared_error', metrics = ["mean_squared_error"])

model.summary()
```

```
Model: "sequential"
_____
Layer (type)                 Output Shape              Param #
===============================================================
dense (Dense)                (None, 10)                140
_____
dense_1 (Dense)              (None, 10)                110
_____
dense_2 (Dense)              (None, 1)                 11
===============================================================
Total params: 261
Trainable params: 261
Non-trainable params: 0
_____
```

Fit Regression Model

```
history = model.fit(x_train, y_train, validation_split = 0.3, epochs = 150)
```

```
Epoch 1/150
1/6 [====>.........................] – ETA: 0s – loss: 0.2556 – mean_squared_error: 0.25566/6 [======
Epoch 2/150
1/6 [====>.........................] – ETA: 0s – loss: 0.2385 – mean_squared_error: 0.23856/6 [======
Epoch 3/150
1/6 [====>.........................] – ETA: 0s – loss: 0.2383 – mean_squared_error: 0.23836/6 [======
Epoch 4/150
1/6 [====>.........................] – ETA: 0s – loss: 0.2691 – mean_squared_error: 0.26916/6 [======
Epoch 5/150
1/6 [====>.........................] – ETA: 0s – loss: 0.2195 – mean_squared_error: 0.21956/6 [======
Epoch 6/150
1/6 [====>.........................] – ETA: 0s – loss: 0.2315 – mean_squared_error: 0.23156/6 [======
Epoch 7/150
1/6 [====>.........................] – ETA: 0s – loss: 0.2186 – mean_squared_error: 0.21866/6 [======
Epoch 8/150
1/6 [====>.........................] – ETA: 0s – loss: 0.2031 – mean_squared_error: 0.20316/6 [======
Epoch 9/150
1/6 [====>.........................] – ETA: 0s – loss: 0.2036 – mean_squared_error: 0.20366/6 [======
Epoch 10/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1991 – mean_squared_error: 0.19916/6 [======
Epoch 11/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1838 – mean_squared_error: 0.18386/6 [======
Epoch 12/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1789 – mean_squared_error: 0.17896/6 [======
Epoch 13/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1876 – mean_squared_error: 0.18766/6 [======
Epoch 14/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1920 – mean_squared_error: 0.19206/6 [======
Epoch 15/150
1/6 [====>.........................] – ETA: 0s – loss: 0.2064 – mean_squared_error: 0.20646/6 [======
Epoch 16/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1764 – mean_squared_error: 0.17646/6 [======
Epoch 17/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1880 – mean_squared_error: 0.18806/6 [======
Epoch 18/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1696 – mean_squared_error: 0.16966/6 [======
Epoch 19/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1624 – mean_squared_error: 0.16246/6 [======
Epoch 20/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1852 – mean_squared_error: 0.18526/6 [======
Epoch 21/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1237 – mean_squared_error: 0.12376/6 [======
Epoch 22/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1422 – mean_squared_error: 0.14226/6 [======
Epoch 23/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1421 – mean_squared_error: 0.14216/6 [======
Epoch 24/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1224 – mean_squared_error: 0.12246/6 [======
Epoch 25/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1369 – mean_squared_error: 0.13696/6 [======
Epoch 26/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1715 – mean_squared_error: 0.17156/6 [======
Epoch 27/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1565 – mean_squared_error: 0.15656/6 [======
Epoch 28/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1700 – mean_squared_error: 0.17006/6 [======
Epoch 29/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1741 – mean_squared_error: 0.17416/6 [======
Epoch 30/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0747 – mean_squared_error: 0.07476/6 [======
Epoch 31/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1483 – mean_squared_error: 0.14836/6 [======
Epoch 32/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1194 – mean_squared_error: 0.11946/6 [======
Epoch 33/150
1/6 [===>..........................] – ETA: 0s – loss: 0.1194 – mean_squared_error: 0.11946/6 [======
Epoch 34/150
1/6 [===>..........................] – ETA: 0s – loss: 0.1332 – mean_squared_error: 0.13326/6 [======
```

```
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1021 - mean_squared_error: 0.10216/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1146 - mean_squared_error: 0.11466/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1112 - mean_squared_error: 0.11126/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1218 - mean_squared_error: 0.12186/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1595 - mean_squared_error: 0.15956/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1578 - mean_squared_error: 0.15786/6 [======
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1091 - mean_squared_error: 0.10916/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1031 - mean_squared_error: 0.10316/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1105 - mean_squared_error: 0.11056/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1005 - mean_squared_error: 0.10056/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0907 - mean_squared_error: 0.09076/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1196 - mean_squared_error: 0.11966/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1394 - mean_squared_error: 0.13946/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1245 - mean_squared_error: 0.12456/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1324 - mean_squared_error: 0.13246/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1263 - mean_squared_error: 0.12636/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1102 - mean_squared_error: 0.11026/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1127 - mean_squared_error: 0.11276/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0867 - mean_squared_error: 0.08676/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0975 - mean_squared_error: 0.09756/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1311 - mean_squared_error: 0.13116/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1304 - mean_squared_error: 0.13046/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1145 - mean_squared_error: 0.11456/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0928 - mean_squared_error: 0.09286/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0990 - mean_squared_error: 0.09906/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1287 - mean_squared_error: 0.12876/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0902 - mean_squared_error: 0.09026/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0700 - mean_squared_error: 0.07006/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0893 - mean_squared_error: 0.08936/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0896 - mean_squared_error: 0.08966/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0970 - mean_squared_error: 0.09706/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1204 - mean_squared_error: 0.12046/6 [======
Epoch 67/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0708 - mean_squared_error: 0.07086/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0612 - mean_squared_error: 0.06126/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1046 - mean_squared_error: 0.10466/6 [======
Epoch 70/150
```

```
1/6 [====>........................] - ETA: 0s - loss: 0.0984 - mean_squared_error: 0.09846/6 [======
Epoch 71/150
1/6 [====>........................] - ETA: 0s - loss: 0.0861 - mean_squared_error: 0.08616/6 [======
Epoch 72/150
1/6 [====>........................] - ETA: 0s - loss: 0.1095 - mean_squared_error: 0.10956/6 [======
Epoch 73/150
1/6 [====>........................] - ETA: 0s - loss: 0.1071 - mean_squared_error: 0.10716/6 [======
Epoch 74/150
1/6 [====>........................] - ETA: 0s - loss: 0.1025 - mean_squared_error: 0.10256/6 [======
Epoch 75/150
1/6 [====>........................] - ETA: 0s - loss: 0.1154 - mean_squared_error: 0.11546/6 [======
Epoch 76/150
1/6 [====>........................] - ETA: 0s - loss: 0.0868 - mean_squared_error: 0.08686/6 [======
Epoch 77/150
1/6 [====>........................] - ETA: 0s - loss: 0.0709 - mean_squared_error: 0.07096/6 [======
Epoch 78/150
1/6 [====>........................] - ETA: 0s - loss: 0.0875 - mean_squared_error: 0.08756/6 [======
Epoch 79/150
1/6 [====>........................] - ETA: 0s - loss: 0.1273 - mean_squared_error: 0.12736/6 [======
Epoch 80/150
1/6 [====>........................] - ETA: 0s - loss: 0.0834 - mean_squared_error: 0.08346/6 [======
Epoch 81/150
1/6 [====>........................] - ETA: 0s - loss: 0.0901 - mean_squared_error: 0.09016/6 [======
Epoch 82/150
1/6 [====>........................] - ETA: 0s - loss: 0.0978 - mean_squared_error: 0.09786/6 [======
Epoch 83/150
1/6 [====>........................] - ETA: 0s - loss: 0.0931 - mean_squared_error: 0.09316/6 [======
Epoch 84/150
1/6 [====>........................] - ETA: 0s - loss: 0.0780 - mean_squared_error: 0.07806/6 [======
Epoch 85/150
1/6 [====>........................] - ETA: 0s - loss: 0.0618 - mean_squared_error: 0.06186/6 [======
Epoch 86/150
1/6 [====>........................] - ETA: 0s - loss: 0.0637 - mean_squared_error: 0.06376/6 [======
Epoch 87/150
1/6 [====>........................] - ETA: 0s - loss: 0.0664 - mean_squared_error: 0.06646/6 [======
Epoch 88/150
1/6 [====>........................] - ETA: 0s - loss: 0.1176 - mean_squared_error: 0.11766/6 [======
Epoch 89/150
1/6 [====>........................] - ETA: 0s - loss: 0.0873 - mean_squared_error: 0.08736/6 [======
Epoch 90/150
1/6 [====>........................] - ETA: 0s - loss: 0.1028 - mean_squared_error: 0.10286/6 [======
Epoch 91/150
1/6 [====>........................] - ETA: 0s - loss: 0.0871 - mean_squared_error: 0.08716/6 [======
Epoch 92/150
1/6 [====>........................] - ETA: 0s - loss: 0.0586 - mean_squared_error: 0.05866/6 [======
Epoch 93/150
1/6 [====>........................] - ETA: 0s - loss: 0.1226 - mean_squared_error: 0.12266/6 [======
Epoch 94/150
1/6 [====>........................] - ETA: 0s - loss: 0.0890 - mean_squared_error: 0.08906/6 [======
Epoch 95/150
1/6 [====>........................] - ETA: 0s - loss: 0.0757 - mean_squared_error: 0.07576/6 [======
Epoch 96/150
1/6 [====>........................] - ETA: 0s - loss: 0.0754 - mean_squared_error: 0.07546/6 [======
Epoch 97/150
1/6 [====>........................] - ETA: 0s - loss: 0.1039 - mean_squared_error: 0.10396/6 [======
Epoch 98/150
1/6 [====>........................] - ETA: 0s - loss: 0.1105 - mean_squared_error: 0.11056/6 [======
Epoch 99/150
1/6 [====>........................] - ETA: 0s - loss: 0.0541 - mean_squared_error: 0.05416/6 [======
Epoch 100/150
1/6 [====>........................] - ETA: 0s - loss: 0.0288 - mean_squared_error: 0.02886/6 [======
Epoch 101/150
1/6 [====>........................] - ETA: 0s - loss: 0.0912 - mean_squared_error: 0.09126/6 [======
Epoch 102/150
1/6 [====>........................] - ETA: 0s - loss: 0.0618 - mean_squared_error: 0.06186/6 [======
Epoch 103/150
1/6 [====>........................] - ETA: 0s - loss: 0.1018 - mean_squared_error: 0.10186/6 [======
Epoch 104/150
1/6 [====>........................] - ETA: 0s - loss: 0.0541 - mean_squared_error: 0.05416/6 [======
Epoch 105/150
1/6 [====>........................] - ETA: 0s - loss: 0.1022 - mean_squared_error: 0.10226/6 [======
```

```
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0648 - mean_squared_error: 0.06486/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0951 - mean_squared_error: 0.09516/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0701 - mean_squared_error: 0.07016/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0820 - mean_squared_error: 0.08206/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0836 - mean_squared_error: 0.08366/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0962 - mean_squared_error: 0.09626/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0758 - mean_squared_error: 0.07586/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0909 - mean_squared_error: 0.09096/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0503 - mean_squared_error: 0.05036/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0730 - mean_squared_error: 0.07306/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0698 - mean_squared_error: 0.06986/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0422 - mean_squared_error: 0.04226/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1083 - mean_squared_error: 0.10836/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1037 - mean_squared_error: 0.10376/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1139 - mean_squared_error: 0.11396/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1206 - mean_squared_error: 0.12066/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0649 - mean_squared_error: 0.06496/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0733 - mean_squared_error: 0.07336/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1075 - mean_squared_error: 0.10756/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0996 - mean_squared_error: 0.09966/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0983 - mean_squared_error: 0.09836/6 [======
Epoch 127/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0447 - mean_squared_error: 0.04476/6 [======
Epoch 128/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0572 - mean_squared_error: 0.05726/6 [======
Epoch 129/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0684 - mean_squared_error: 0.06846/6 [======
Epoch 130/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0824 - mean_squared_error: 0.08246/6 [======
Epoch 131/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0744 - mean_squared_error: 0.07446/6 [======
Epoch 132/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1053 - mean_squared_error: 0.10536/6 [======
Epoch 133/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0707 - mean_squared_error: 0.07076/6 [======
Epoch 134/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0719 - mean_squared_error: 0.07196/6 [======
Epoch 135/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0371 - mean_squared_error: 0.03716/6 [======
Epoch 136/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0693 - mean_squared_error: 0.06936/6 [======
Epoch 137/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0820 - mean_squared_error: 0.08206/6 [======
Epoch 138/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0469 - mean_squared_error: 0.04696/6 [======
Epoch 139/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0946 - mean_squared_error: 0.09466/6 [======
Epoch 140/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0614 - mean_squared_error: 0.06146/6 [======
Epoch 141/150
```

```
1/6 [===>..........................] – ETA: 0s – loss: 0.1028 – mean_squared_error: 0.10286/6 [======
Epoch 142/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1055 – mean_squared_error: 0.10556/6 [======
Epoch 143/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0921 – mean_squared_error: 0.09216/6 [======
Epoch 144/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1692 – mean_squared_error: 0.16926/6 [======
Epoch 145/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0433 – mean_squared_error: 0.04336/6 [======
Epoch 146/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0806 – mean_squared_error: 0.08066/6 [======
Epoch 147/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0446 – mean_squared_error: 0.04466/6 [======
Epoch 148/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0752 – mean_squared_error: 0.07526/6 [======
Epoch 149/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0920 – mean_squared_error: 0.09206/6 [======
Epoch 150/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0426 – mean_squared_error: 0.04266/6 [======
```

Model Evaluation

```python
f1 = f1_score(y_train, np.around(model.predict(x_train)))
y_3 = f1_score(y_test, np.around(model.predict(x_test)))

print("F1 score on trainset = ", f1)
print("F1 score on testset = ", y_3)
```

```
F1 score on trainset =  0.9056603773584906
F1 score on testset =  0.8985507246376813
```

```python
plt.plot(history.history['mean_squared_error'])
sns.despine(left = True, bottom = True)
sns.set_theme(style = "dark")
plt.tick_params(labelleft=False, left=False)
plt.title('Root Mean Squared Error', fontsize = 14)
plt.ylabel('rmse')
plt.xlabel('epoch')
plt.ylabel(' ')
plt.show()
```
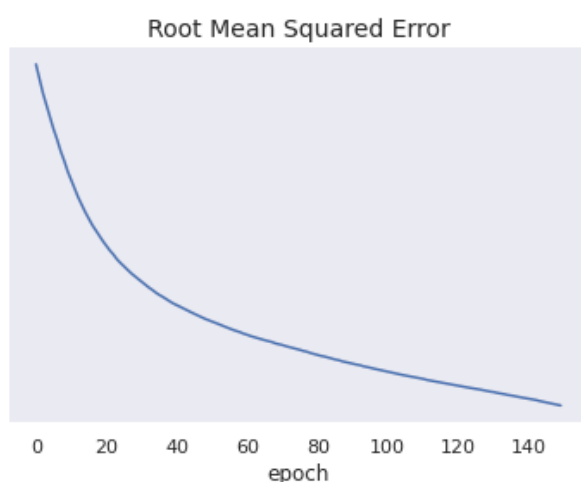

Observation: Model is highly optimised in 20 epochs

Test Accuracy

```python
mse_train = mean_squared_error(y_train, model.predict(x_train))
mse_test = mean_squared_error(y_test, model.predict(x_test))

print("Training Set Accuracy = ", 100 - mse_train*100)
print("Testing Set Accuracy = ", 100 - mse_test*100)
```

Training Set Accuracy = 91.06055010449597
Testing Set Accuracy = 90.06260560516301

```python
# Convert test data
y_pred_test = np.around(model.predict(x_test))

# Compute confusion matrix
cnf_matrix_nn = confusion_matrix(y_test, y_pred_test, labels = [1,0])
np.set_printoptions(precision = 2)

# Plot non-normalized confusion matrix
plt.figure()
plot_confusion_matrix(cnf_matrix_nn, classes = ['heart disease', 'without heart disease'],
                      normalize = False,  title = 'Confusion matrix for Neural Network')

print (classification_report(y_test, y_pred_test))
```

```
Confusion matrix, without normalization
[[31  5]
 [ 2 23]]
              precision    recall  f1-score   support

           0       0.82      0.92      0.87        25
           1       0.94      0.86      0.90        36

    accuracy                           0.89        61
   macro avg       0.88      0.89      0.88        61
weighted avg       0.89      0.89      0.89        61
```


Confusion matrix for Neural Network
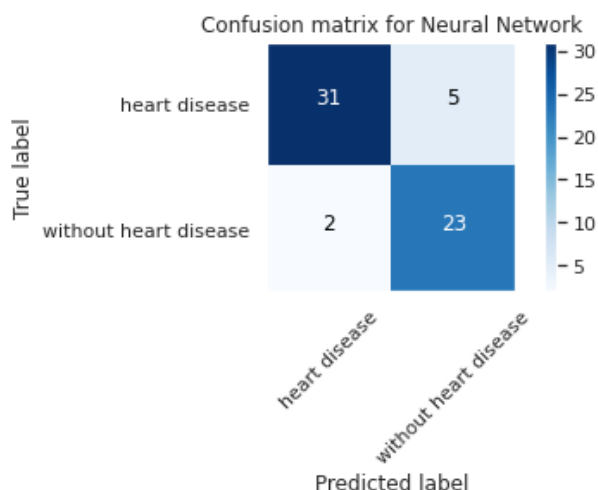
Learning Curves

```python
history_dict = history.history
loss_values = history_dict['loss']
val_loss_values = history_dict['val_loss']
accuracy_ = history_dict['mean_squared_error']
val_accuracy_ = history_dict['val_mean_squared_error']

accuracy = []
val_accuracy = []
for i in range(len(accuracy_)):
    accuracy.append(1 - accuracy_[i])
    val_accuracy.append(1 - val_accuracy_[i])

epochs = range(1, len(loss_values) + 1)
```

Plot the model Accuracy-vs-Epochs and Loss-vs-Epoch

```python
fig, ax = plt.subplots(1, 2, figsize = (15, 6))
sns.set_theme(style = "dark")
x_dot = [0, 150]
y_dot_accuracy = [max(val_accuracy), max(val_accuracy)]
y_dot_loss = [min(val_loss_values), min(val_loss_values)]

ax[0].plot(epochs, accuracy, 'r', label = 'Training accuracy', linewidth = 2)
ax[0].plot(epochs, val_accuracy, 'b', label = 'Validation accuracy', linewidth = 2)
ax[0].plot(x_dot, y_dot_accuracy, linestyle = (0,(0.1,2)), dash_capstyle = 'round', linewidth = 2, cc
ax[0].set_title('Training - Validation Accuracy', fontsize=12)
ax[0].set_xlabel('Epochs', fontsize = 10)
ax[0].set_ylabel('Accuracy', fontsize = 10)
ax[0].spines['right'].set_visible(False)
ax[0].spines['top'].set_visible(False)
ax[0].spines['left'].set_visible(False)
ax[0].legend()

ax[1].plot(epochs, loss_values, 'r', label = 'Training loss', linewidth = 2)
ax[1].plot(epochs, val_loss_values, 'b', label = 'Validation loss', linewidth = 2)
ax[1].plot(x_dot, y_dot_loss, linestyle = (0,(0.1,2)), dash_capstyle = 'round', linewidth = 2, color
ax[1].set_title('Training - Validation Loss', fontsize = 12)
ax[1].set_xlabel('Epochs', fontsize = 10)
ax[1].set_ylabel('Loss', fontsize = 10)
ax[1].spines['right'].set_visible(False)
ax[1].spines['top'].set_visible(False)
ax[1].spines['left'].set_visible(False)
ax[1].legend()

plt.show()
```
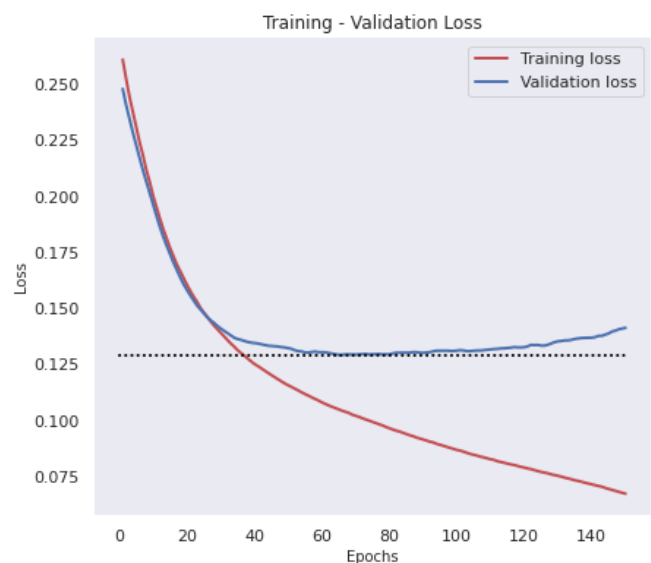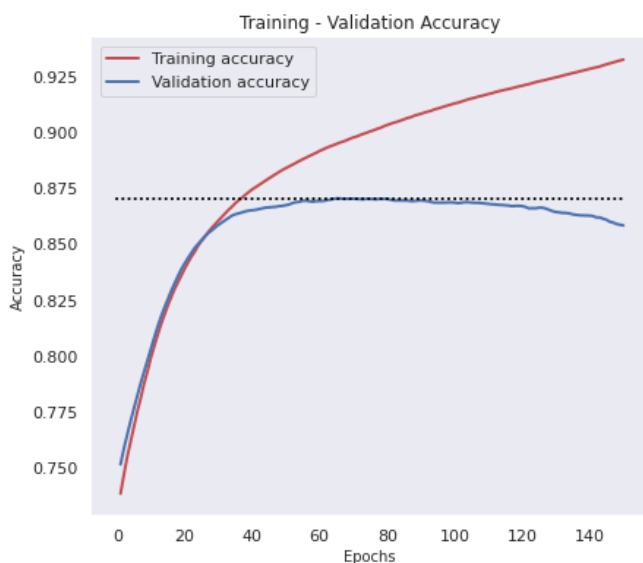
Observation:

This Neural Network suffers from high varience although rate of decay of accuracy in low. Stoping at 60 epochs results better accuracy.

Most noticable problem is lack of training examples. Which can be overcome by training 50 models and taking average metrics.

```
model.save('heart_disease_trained.h5')

print("...model saved")
```
...model saved

Model Training with 50 models

Train 50 models

To iterate model training 50 times and to calculate mean (μ) and standard deviation (σ) :

1. Create empty list *mse_list* to store the mse values obtained after every iteration
2. Loop through the model 50 times:

- Randomly split x_data and y into train test dataset
- Use train dataset to train model
- Use test dataset to predict y
- Calculate mse for each iteration and populate *mse_list*

3. Calculate mean (μ) and standard deviation (σ) from *mse_list*

```
def regression_model():
    model_m = Sequential()
    model_m.add(Dense(10, activation = 'relu', input_shape = (x_train.shape[1],)))
    model_m.add(Dense(10, activation = 'relu'))
    model_m.add(Dense(1, activation = 'sigmoid'))

    model_m.compile(optimizer = 'adam', loss = 'mean_squared_error', metrics = ["mean_squared_error"]

    return model_m
```

```python
mse_list_train = []
mse_list_test = []

for i in range(50):
    x_train, x_test, y_train, y_test = train_test_split( X, y, test_size = 0.2, random_state = 4)

    # Train and fit model
    model_m = regression_model()
    print('\n\n\nTraining Model # ' , i+1 , '\n\n')
    model_m.fit(x_train, y_train, validation_split = 0.3, epochs = 150)
    print('\n')

    # Prediction and evaluation
    mse_train = mean_squared_error(y_train, model_m.predict(x_train))
    mse_test = mean_squared_error(y_test, model_m.predict(x_test))
    print('\nMSE on Train Set for Training Model #', i+1 , ' = ', mse_train)
    print('\nMSE on Test Set for Training Model #', i+1 , ' = ', mse_test)

    print("\n", classification_report(y_test, np.around(model_m.predict(x_test))))

    # Append mse to mse_list
    mse_list_train.append(mse_train)
    mse_list_test.append(mse_test)
```

```
Epoch 109/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0963 – mean_squared_error: 0.09636/6 [======
Epoch 110/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1389 – mean_squared_error: 0.13896/6 [======
Epoch 111/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0793 – mean_squared_error: 0.07936/6 [======
Epoch 112/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0824 – mean_squared_error: 0.08246/6 [======
Epoch 113/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0773 – mean_squared_error: 0.07736/6 [======
Epoch 114/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1425 – mean_squared_error: 0.14256/6 [======
Epoch 115/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0697 – mean_squared_error: 0.06976/6 [======
Epoch 116/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0632 – mean_squared_error: 0.06326/6 [======
Epoch 117/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0850 – mean_squared_error: 0.08506/6 [======
Epoch 118/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1283 – mean_squared_error: 0.12836/6 [======
Epoch 119/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0979 – mean_squared_error: 0.09796/6 [======
Epoch 120/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0608 – mean_squared_error: 0.06086/6 [======
Epoch 121/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0997 – mean_squared_error: 0.09976/6 [======
Epoch 122/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0836 – mean_squared_error: 0.08366/6 [======
Epoch 123/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0577 – mean_squared_error: 0.05776/6 [======
Epoch 124/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1020 – mean_squared_error: 0.10206/6 [======
Epoch 125/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1196 – mean_squared_error: 0.11966/6 [======
Epoch 126/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0717 – mean_squared_error: 0.07176/6 [======
Epoch 127/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0624 – mean_squared_error: 0.06246/6 [======
Epoch 128/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0891 – mean_squared_error: 0.08916/6 [======
Epoch 129/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0890 – mean_squared_error: 0.08906/6 [======
Epoch 130/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0834 – mean_squared_error: 0.08346/6 [======
Epoch 131/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0585 – mean_squared_error: 0.05856/6 [======
```

```
Epoch 132/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0475 - mean_squared_error: 0.04756/6 [======
Epoch 133/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0658 - mean_squared_error: 0.06586/6 [======
Epoch 134/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0704 - mean_squared_error: 0.07046/6 [======
Epoch 135/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1180 - mean_squared_error: 0.11806/6 [======
Epoch 136/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1669 - mean_squared_error: 0.16696/6 [======
Epoch 137/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0580 - mean_squared_error: 0.05806/6 [======
Epoch 138/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0890 - mean_squared_error: 0.08906/6 [======
Epoch 139/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0780 - mean_squared_error: 0.07806/6 [======
Epoch 140/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0926 - mean_squared_error: 0.09266/6 [======
Epoch 141/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1352 - mean_squared_error: 0.13526/6 [======
Epoch 142/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0956 - mean_squared_error: 0.09566/6 [======
Epoch 143/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0673 - mean_squared_error: 0.06736/6 [======
Epoch 144/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0915 - mean_squared_error: 0.09156/6 [======
Epoch 145/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0921 - mean_squared_error: 0.09216/6 [======
Epoch 146/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0614 - mean_squared_error: 0.06146/6 [======
Epoch 147/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1127 - mean_squared_error: 0.11276/6 [======
Epoch 148/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0731 - mean_squared_error: 0.07316/6 [======
Epoch 149/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0784 - mean_squared_error: 0.07846/6 [======
Epoch 150/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0555 - mean_squared_error: 0.05556/6 [======
```

```
MSE on Train Set for Training Model # 31  =  0.10176757446686406

MSE on Test Set for Training Model # 31  =  0.09497273122386636
```

```
              precision    recall  f1-score   support

           0       0.81      0.84      0.82        25
           1       0.89      0.86      0.87        36

    accuracy                           0.85        61
   macro avg       0.85      0.85      0.85        61
weighted avg       0.85      0.85      0.85        61
```

```
Training Model #  32


Epoch 1/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2427 - mean_squared_error: 0.24276/6 [======
Epoch 2/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2349 - mean_squared_error: 0.23496/6 [======
Epoch 3/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2228 - mean_squared_error: 0.22286/6 [======
Epoch 4/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2348 - mean_squared_error: 0.23486/6 [======
Epoch 5/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2367 - mean_squared_error: 0.23676/6 [======
Epoch 6/150
```

```
1/6 [====>........................] - ETA: 0s - loss: 0.2215 - mean_squared_error: 0.22156/6 [======
Epoch 7/150
1/6 [====>........................] - ETA: 0s - loss: 0.2466 - mean_squared_error: 0.24666/6 [======
Epoch 8/150
1/6 [====>........................] - ETA: 0s - loss: 0.2283 - mean_squared_error: 0.22836/6 [======
Epoch 9/150
1/6 [====>........................] - ETA: 0s - loss: 0.2309 - mean_squared_error: 0.23096/6 [======
Epoch 10/150
1/6 [====>........................] - ETA: 0s - loss: 0.2068 - mean_squared_error: 0.20686/6 [======
Epoch 11/150
1/6 [====>........................] - ETA: 0s - loss: 0.2216 - mean_squared_error: 0.22166/6 [======
Epoch 12/150
1/6 [====>........................] - ETA: 0s - loss: 0.1860 - mean_squared_error: 0.18606/6 [======
Epoch 13/150
1/6 [====>........................] - ETA: 0s - loss: 0.1989 - mean_squared_error: 0.19896/6 [======
Epoch 14/150
1/6 [====>........................] - ETA: 0s - loss: 0.2038 - mean_squared_error: 0.20386/6 [======
Epoch 15/150
1/6 [====>........................] - ETA: 0s - loss: 0.1914 - mean_squared_error: 0.19146/6 [======
Epoch 16/150
1/6 [====>........................] - ETA: 0s - loss: 0.2136 - mean_squared_error: 0.21366/6 [======
Epoch 17/150
1/6 [====>........................] - ETA: 0s - loss: 0.1934 - mean_squared_error: 0.19346/6 [======
Epoch 18/150
1/6 [====>........................] - ETA: 0s - loss: 0.1797 - mean_squared_error: 0.17976/6 [======
Epoch 19/150
1/6 [====>........................] - ETA: 0s - loss: 0.1730 - mean_squared_error: 0.17306/6 [======
Epoch 20/150
1/6 [====>........................] - ETA: 0s - loss: 0.1648 - mean_squared_error: 0.16486/6 [======
Epoch 21/150
1/6 [====>........................] - ETA: 0s - loss: 0.1964 - mean_squared_error: 0.19646/6 [======
Epoch 22/150
1/6 [====>........................] - ETA: 0s - loss: 0.1934 - mean_squared_error: 0.19346/6 [======
Epoch 23/150
1/6 [====>........................] - ETA: 0s - loss: 0.1448 - mean_squared_error: 0.14486/6 [======
Epoch 24/150
1/6 [====>........................] - ETA: 0s - loss: 0.1329 - mean_squared_error: 0.13296/6 [======
Epoch 25/150
1/6 [====>........................] - ETA: 0s - loss: 0.1792 - mean_squared_error: 0.17926/6 [======
Epoch 26/150
1/6 [====>........................] - ETA: 0s - loss: 0.1554 - mean_squared_error: 0.15546/6 [======
Epoch 27/150
1/6 [====>........................] - ETA: 0s - loss: 0.1482 - mean_squared_error: 0.14826/6 [======
Epoch 28/150
1/6 [====>........................] - ETA: 0s - loss: 0.1392 - mean_squared_error: 0.13926/6 [======
Epoch 29/150
1/6 [====>........................] - ETA: 0s - loss: 0.1358 - mean_squared_error: 0.13586/6 [======
Epoch 30/150
1/6 [====>........................] - ETA: 0s - loss: 0.1405 - mean_squared_error: 0.14056/6 [======
Epoch 31/150
1/6 [====>........................] - ETA: 0s - loss: 0.1763 - mean_squared_error: 0.17636/6 [======
Epoch 32/150
1/6 [====>........................] - ETA: 0s - loss: 0.1572 - mean_squared_error: 0.15726/6 [======
Epoch 33/150
1/6 [====>........................] - ETA: 0s - loss: 0.1181 - mean_squared_error: 0.11816/6 [======
Epoch 34/150
1/6 [====>........................] - ETA: 0s - loss: 0.1731 - mean_squared_error: 0.17316/6 [======
Epoch 35/150
1/6 [====>........................] - ETA: 0s - loss: 0.1322 - mean_squared_error: 0.13226/6 [======
Epoch 36/150
1/6 [====>........................] - ETA: 0s - loss: 0.1183 - mean_squared_error: 0.11836/6 [======
Epoch 37/150
1/6 [====>........................] - ETA: 0s - loss: 0.1741 - mean_squared_error: 0.17416/6 [======
Epoch 38/150
1/6 [====>........................] - ETA: 0s - loss: 0.1658 - mean_squared_error: 0.16586/6 [======
Epoch 39/150
1/6 [====>........................] - ETA: 0s - loss: 0.0808 - mean_squared_error: 0.08086/6 [======
Epoch 40/150
1/6 [====>........................] - ETA: 0s - loss: 0.1614 - mean_squared_error: 0.16146/6 [======
Epoch 41/150
1/6 [====>........................] - ETA: 0s - loss: 0.1249 - mean_squared_error: 0.12496/6 [======
```

```
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1865 - mean_squared_error: 0.18656/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0812 - mean_squared_error: 0.08126/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0821 - mean_squared_error: 0.08216/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1121 - mean_squared_error: 0.11216/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1349 - mean_squared_error: 0.13496/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1490 - mean_squared_error: 0.14906/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1626 - mean_squared_error: 0.16266/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1418 - mean_squared_error: 0.14186/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0893 - mean_squared_error: 0.08936/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0885 - mean_squared_error: 0.08856/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0929 - mean_squared_error: 0.09296/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1229 - mean_squared_error: 0.12296/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0941 - mean_squared_error: 0.09416/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0672 - mean_squared_error: 0.06726/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0856 - mean_squared_error: 0.08566/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1676 - mean_squared_error: 0.16766/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0908 - mean_squared_error: 0.09086/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1229 - mean_squared_error: 0.12296/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1612 - mean_squared_error: 0.16126/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0694 - mean_squared_error: 0.06946/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0877 - mean_squared_error: 0.08776/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1153 - mean_squared_error: 0.11536/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0916 - mean_squared_error: 0.09166/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0760 - mean_squared_error: 0.07606/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0923 - mean_squared_error: 0.09236/6 [======
Epoch 67/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0853 - mean_squared_error: 0.08536/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1684 - mean_squared_error: 0.16846/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1160 - mean_squared_error: 0.11606/6 [======
Epoch 70/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0677 - mean_squared_error: 0.06776/6 [======
Epoch 71/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1038 - mean_squared_error: 0.10386/6 [======
Epoch 72/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0650 - mean_squared_error: 0.06506/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1371 - mean_squared_error: 0.13716/6 [======
Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1102 - mean_squared_error: 0.11026/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1225 - mean_squared_error: 0.12256/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1359 - mean_squared_error: 0.13596/6 [======
Epoch 77/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.1064 - mean_squared_error: 0.10646/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1798 - mean_squared_error: 0.17986/6 [======
Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0453 - mean_squared_error: 0.04536/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0825 - mean_squared_error: 0.08256/6 [======
Epoch 81/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0736 - mean_squared_error: 0.07366/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0683 - mean_squared_error: 0.06836/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1223 - mean_squared_error: 0.12236/6 [======
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0919 - mean_squared_error: 0.09196/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1059 - mean_squared_error: 0.10596/6 [======
Epoch 86/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0948 - mean_squared_error: 0.09486/6 [======
Epoch 87/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0621 - mean_squared_error: 0.06216/6 [======
Epoch 88/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0897 - mean_squared_error: 0.08976/6 [======
Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0824 - mean_squared_error: 0.08246/6 [======
Epoch 90/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0690 - mean_squared_error: 0.06906/6 [======
Epoch 91/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0917 - mean_squared_error: 0.09176/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1187 - mean_squared_error: 0.11876/6 [======
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1338 - mean_squared_error: 0.13386/6 [======
Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0538 - mean_squared_error: 0.05386/6 [======
Epoch 95/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0767 - mean_squared_error: 0.07676/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0657 - mean_squared_error: 0.06576/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1284 - mean_squared_error: 0.12846/6 [======
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0545 - mean_squared_error: 0.05456/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0637 - mean_squared_error: 0.06376/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1048 - mean_squared_error: 0.10486/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0635 - mean_squared_error: 0.06356/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0902 - mean_squared_error: 0.09026/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0555 - mean_squared_error: 0.05556/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0629 - mean_squared_error: 0.06296/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0473 - mean_squared_error: 0.04736/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0388 - mean_squared_error: 0.03886/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0775 - mean_squared_error: 0.07756/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0990 - mean_squared_error: 0.09906/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0579 - mean_squared_error: 0.05796/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1092 - mean_squared_error: 0.10926/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0924 - mean_squared_error: 0.09246/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0748 - mean_squared_error: 0.07486/6 [======
```

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Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1394 - mean_squared_error: 0.13946/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0890 - mean_squared_error: 0.08906/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0626 - mean_squared_error: 0.06266/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1108 - mean_squared_error: 0.11086/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0717 - mean_squared_error: 0.07176/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1165 - mean_squared_error: 0.11656/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0673 - mean_squared_error: 0.06736/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0870 - mean_squared_error: 0.08706/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1395 - mean_squared_error: 0.13956/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1451 - mean_squared_error: 0.14516/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0814 - mean_squared_error: 0.08146/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0850 - mean_squared_error: 0.08506/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0202 - mean_squared_error: 0.02026/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0165 - mean_squared_error: 0.01656/6 [======
Epoch 127/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0952 - mean_squared_error: 0.09526/6 [======
Epoch 128/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0966 - mean_squared_error: 0.09666/6 [======
Epoch 129/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0518 - mean_squared_error: 0.05186/6 [======
Epoch 130/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0784 - mean_squared_error: 0.07846/6 [======
Epoch 131/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0493 - mean_squared_error: 0.04936/6 [======
Epoch 132/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0544 - mean_squared_error: 0.05446/6 [======
Epoch 133/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1027 - mean_squared_error: 0.10276/6 [======
Epoch 134/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0253 - mean_squared_error: 0.02536/6 [======
Epoch 135/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0511 - mean_squared_error: 0.05116/6 [======
Epoch 136/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0777 - mean_squared_error: 0.07776/6 [======
Epoch 137/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0578 - mean_squared_error: 0.05786/6 [======
Epoch 138/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0544 - mean_squared_error: 0.05446/6 [======
Epoch 139/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0586 - mean_squared_error: 0.05866/6 [======
Epoch 140/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0643 - mean_squared_error: 0.06436/6 [======
Epoch 141/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0631 - mean_squared_error: 0.06316/6 [======
Epoch 142/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0223 - mean_squared_error: 0.02236/6 [======
Epoch 143/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0923 - mean_squared_error: 0.09236/6 [======
Epoch 144/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1025 - mean_squared_error: 0.10256/6 [======
Epoch 145/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0425 - mean_squared_error: 0.04256/6 [======
Epoch 146/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0511 - mean_squared_error: 0.05116/6 [======
Epoch 147/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0425 - mean_squared_error: 0.04256/6 [======
Epoch 148/150
```

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1/6 [====>.........................] - ETA: 0s - loss: 0.0735 - mean_squared_error: 0.07356/6 [======
Epoch 149/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0627 - mean_squared_error: 0.06276/6 [======
Epoch 150/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0551 - mean_squared_error: 0.05516/6 [======


MSE on Train Set for Training Model # 32  =  0.07834824333389694

MSE on Test Set for Training Model # 32  =  0.08697152199509382

              precision    recall  f1-score   support

           0       0.91      0.84      0.87        25
           1       0.89      0.94      0.92        36

    accuracy                           0.90        61
   macro avg       0.90      0.89      0.90        61
weighted avg       0.90      0.90      0.90        61



Training Model #  33


Epoch 1/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2432 - mean_squared_error: 0.24326/6 [======
Epoch 2/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2518 - mean_squared_error: 0.25186/6 [======
Epoch 3/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2579 - mean_squared_error: 0.25796/6 [======
Epoch 4/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2434 - mean_squared_error: 0.24346/6 [======
Epoch 5/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1996 - mean_squared_error: 0.19966/6 [======
Epoch 6/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2308 - mean_squared_error: 0.23086/6 [======
Epoch 7/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2341 - mean_squared_error: 0.23416/6 [======
Epoch 8/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2190 - mean_squared_error: 0.21906/6 [======
Epoch 9/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2129 - mean_squared_error: 0.21296/6 [======
Epoch 10/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2308 - mean_squared_error: 0.23086/6 [======
Epoch 11/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2057 - mean_squared_error: 0.20576/6 [======
Epoch 12/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1988 - mean_squared_error: 0.19886/6 [======
Epoch 13/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2095 - mean_squared_error: 0.20956/6 [======
Epoch 14/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2117 - mean_squared_error: 0.21176/6 [======
Epoch 15/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2019 - mean_squared_error: 0.20196/6 [======
Epoch 16/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1903 - mean_squared_error: 0.19036/6 [======
Epoch 17/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1722 - mean_squared_error: 0.17226/6 [======
Epoch 18/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2023 - mean_squared_error: 0.20236/6 [======
Epoch 19/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1850 - mean_squared_error: 0.18506/6 [======
Epoch 20/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1939 - mean_squared_error: 0.19396/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1861 - mean_squared_error: 0.18616/6 [======
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1952 - mean_squared_error: 0.19526/6 [======
```

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Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1369 - mean_squared_error: 0.13696/6 [======
Epoch 24/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1606 - mean_squared_error: 0.16066/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1837 - mean_squared_error: 0.18376/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1734 - mean_squared_error: 0.17346/6 [======
Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1799 - mean_squared_error: 0.17996/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1445 - mean_squared_error: 0.14456/6 [======
Epoch 29/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1588 - mean_squared_error: 0.15886/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0979 - mean_squared_error: 0.09796/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1668 - mean_squared_error: 0.16686/6 [======
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1340 - mean_squared_error: 0.13406/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1466 - mean_squared_error: 0.14666/6 [======
Epoch 34/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1406 - mean_squared_error: 0.14066/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1626 - mean_squared_error: 0.16266/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1686 - mean_squared_error: 0.16866/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1597 - mean_squared_error: 0.15976/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1442 - mean_squared_error: 0.14426/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1454 - mean_squared_error: 0.14546/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1421 - mean_squared_error: 0.14216/6 [======
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0934 - mean_squared_error: 0.09346/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1330 - mean_squared_error: 0.13306/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1127 - mean_squared_error: 0.11276/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1696 - mean_squared_error: 0.16966/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1476 - mean_squared_error: 0.14766/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1183 - mean_squared_error: 0.11836/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1247 - mean_squared_error: 0.12476/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1536 - mean_squared_error: 0.15366/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1245 - mean_squared_error: 0.12456/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1332 - mean_squared_error: 0.13326/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1025 - mean_squared_error: 0.10256/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0820 - mean_squared_error: 0.08206/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1591 - mean_squared_error: 0.15916/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1275 - mean_squared_error: 0.12756/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0867 - mean_squared_error: 0.08676/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0870 - mean_squared_error: 0.08706/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1433 - mean_squared_error: 0.14336/6 [======
Epoch 58/150
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1/6 [====>.........................] - ETA: 0s - loss: 0.1135 - mean_squared_error: 0.11356/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1325 - mean_squared_error: 0.13256/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0957 - mean_squared_error: 0.09576/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0606 - mean_squared_error: 0.06066/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0777 - mean_squared_error: 0.07776/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0910 - mean_squared_error: 0.09106/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0873 - mean_squared_error: 0.08736/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0587 - mean_squared_error: 0.05876/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0791 - mean_squared_error: 0.07916/6 [======
Epoch 67/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0897 - mean_squared_error: 0.08976/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1139 - mean_squared_error: 0.11396/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0646 - mean_squared_error: 0.06466/6 [======
Epoch 70/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0749 - mean_squared_error: 0.07496/6 [======
Epoch 71/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0897 - mean_squared_error: 0.08976/6 [======
Epoch 72/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0931 - mean_squared_error: 0.09316/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0774 - mean_squared_error: 0.07746/6 [======
Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0404 - mean_squared_error: 0.04046/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1402 - mean_squared_error: 0.14026/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0917 - mean_squared_error: 0.09176/6 [======
Epoch 77/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1360 - mean_squared_error: 0.13606/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0740 - mean_squared_error: 0.07406/6 [======
Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0503 - mean_squared_error: 0.05036/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0956 - mean_squared_error: 0.09566/6 [======
Epoch 81/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0765 - mean_squared_error: 0.07656/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0856 - mean_squared_error: 0.08566/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0802 - mean_squared_error: 0.08026/6 [======
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1148 - mean_squared_error: 0.11486/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0724 - mean_squared_error: 0.07246/6 [======
Epoch 86/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0649 - mean_squared_error: 0.06496/6 [======
Epoch 87/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0969 - mean_squared_error: 0.09696/6 [======
Epoch 88/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0647 - mean_squared_error: 0.06476/6 [======
Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0604 - mean_squared_error: 0.06046/6 [======
Epoch 90/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0660 - mean_squared_error: 0.06606/6 [======
Epoch 91/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0449 - mean_squared_error: 0.04496/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1214 - mean_squared_error: 0.12146/6 [======
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0521 - mean_squared_error: 0.05216/6 [======
```

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Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0458 - mean_squared_error: 0.04586/6 [======
Epoch 95/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0641 - mean_squared_error: 0.06416/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0448 - mean_squared_error: 0.04486/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1164 - mean_squared_error: 0.11646/6 [======
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0956 - mean_squared_error: 0.09566/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0224 - mean_squared_error: 0.02246/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0888 - mean_squared_error: 0.08886/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0362 - mean_squared_error: 0.03626/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1296 - mean_squared_error: 0.12966/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0953 - mean_squared_error: 0.09536/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0349 - mean_squared_error: 0.03496/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0441 - mean_squared_error: 0.04416/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0647 - mean_squared_error: 0.06476/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0671 - mean_squared_error: 0.06716/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0691 - mean_squared_error: 0.06916/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0775 - mean_squared_error: 0.07756/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0429 - mean_squared_error: 0.04296/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0805 - mean_squared_error: 0.08056/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0662 - mean_squared_error: 0.06626/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0549 - mean_squared_error: 0.05496/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0890 - mean_squared_error: 0.08906/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0175 - mean_squared_error: 0.01756/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0624 - mean_squared_error: 0.06246/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1351 - mean_squared_error: 0.13516/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0903 - mean_squared_error: 0.09036/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0802 - mean_squared_error: 0.08026/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0709 - mean_squared_error: 0.07096/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0697 - mean_squared_error: 0.06976/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0538 - mean_squared_error: 0.05386/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0309 - mean_squared_error: 0.03096/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0579 - mean_squared_error: 0.05796/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0875 - mean_squared_error: 0.08756/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0423 - mean_squared_error: 0.04236/6 [======
Epoch 127/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0595 - mean_squared_error: 0.05956/6 [======
Epoch 128/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1260 - mean_squared_error: 0.12606/6 [======
Epoch 129/150
```

```
1/6 [====>........................] - ETA: 0s - loss: 0.0705 - mean_squared_error: 0.07056/6 [======
Epoch 130/150
1/6 [====>........................] - ETA: 0s - loss: 0.0466 - mean_squared_error: 0.04666/6 [======
Epoch 131/150
1/6 [====>........................] - ETA: 0s - loss: 0.0641 - mean_squared_error: 0.06416/6 [======
Epoch 132/150
1/6 [====>........................] - ETA: 0s - loss: 0.0384 - mean_squared_error: 0.03846/6 [======
Epoch 133/150
1/6 [====>........................] - ETA: 0s - loss: 0.0594 - mean_squared_error: 0.05946/6 [======
Epoch 134/150
1/6 [====>........................] - ETA: 0s - loss: 0.1149 - mean_squared_error: 0.11496/6 [======
Epoch 135/150
1/6 [====>........................] - ETA: 0s - loss: 0.0584 - mean_squared_error: 0.05846/6 [======
Epoch 136/150
1/6 [====>........................] - ETA: 0s - loss: 0.0402 - mean_squared_error: 0.04026/6 [======
Epoch 137/150
1/6 [====>........................] - ETA: 0s - loss: 0.0979 - mean_squared_error: 0.09796/6 [======
Epoch 138/150
1/6 [====>........................] - ETA: 0s - loss: 0.0370 - mean_squared_error: 0.03706/6 [======
Epoch 139/150
1/6 [====>........................] - ETA: 0s - loss: 0.1025 - mean_squared_error: 0.10256/6 [======
Epoch 140/150
1/6 [====>........................] - ETA: 0s - loss: 0.0369 - mean_squared_error: 0.03696/6 [======
Epoch 141/150
1/6 [====>........................] - ETA: 0s - loss: 0.0435 - mean_squared_error: 0.04356/6 [======
Epoch 142/150
1/6 [====>........................] - ETA: 0s - loss: 0.0509 - mean_squared_error: 0.05096/6 [======
Epoch 143/150
1/6 [====>........................] - ETA: 0s - loss: 0.0442 - mean_squared_error: 0.04426/6 [======
Epoch 144/150
1/6 [====>........................] - ETA: 0s - loss: 0.0343 - mean_squared_error: 0.03436/6 [======
Epoch 145/150
1/6 [====>........................] - ETA: 0s - loss: 0.0374 - mean_squared_error: 0.03746/6 [======
Epoch 146/150
1/6 [====>........................] - ETA: 0s - loss: 0.0199 - mean_squared_error: 0.01996/6 [======
Epoch 147/150
1/6 [====>........................] - ETA: 0s - loss: 0.0281 - mean_squared_error: 0.02816/6 [======
Epoch 148/150
1/6 [====>........................] - ETA: 0s - loss: 0.0485 - mean_squared_error: 0.04856/6 [======
Epoch 149/150
1/6 [====>........................] - ETA: 0s - loss: 0.0449 - mean_squared_error: 0.04496/6 [======
Epoch 150/150
1/6 [====>........................] - ETA: 0s - loss: 0.0242 - mean_squared_error: 0.02426/6 [======
```

MSE on Train Set for Training Model # 33 = 0.07843111335768553

MSE on Test Set for Training Model # 33 = 0.07173068259421415

```
              precision    recall  f1-score   support

           0       0.88      0.88      0.88        25
           1       0.92      0.92      0.92        36

    accuracy                           0.90        61
   macro avg       0.90      0.90      0.90        61
weighted avg       0.90      0.90      0.90        61
```

Training Model # 34

```
Epoch 1/150
1/6 [====>........................] - ETA: 0s - loss: 0.2525 - mean_squared_error: 0.25256/6 [======
Epoch 2/150
1/6 [====>........................] - ETA: 0s - loss: 0.2039 - mean_squared_error: 0.20396/6 [======
Epoch 3/150
1/6 [====>........................] - ETA: 0s - loss: 0.2495 - mean_squared_error: 0.24956/6 [======
```

```
Epoch 4/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2021 - mean_squared_error: 0.20216/6 [======
Epoch 5/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1711 - mean_squared_error: 0.17116/6 [======
Epoch 6/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2015 - mean_squared_error: 0.20156/6 [======
Epoch 7/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2293 - mean_squared_error: 0.22936/6 [======
Epoch 8/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1901 - mean_squared_error: 0.19016/6 [======
Epoch 9/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1848 - mean_squared_error: 0.18486/6 [======
Epoch 10/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1704 - mean_squared_error: 0.17046/6 [======
Epoch 11/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1912 - mean_squared_error: 0.19126/6 [======
Epoch 12/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2066 - mean_squared_error: 0.20666/6 [======
Epoch 13/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1984 - mean_squared_error: 0.19846/6 [======
Epoch 14/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1770 - mean_squared_error: 0.17706/6 [======
Epoch 15/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2004 - mean_squared_error: 0.20046/6 [======
Epoch 16/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1446 - mean_squared_error: 0.14466/6 [======
Epoch 17/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1366 - mean_squared_error: 0.13666/6 [======
Epoch 18/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1827 - mean_squared_error: 0.18276/6 [======
Epoch 19/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1797 - mean_squared_error: 0.17976/6 [======
Epoch 20/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1582 - mean_squared_error: 0.15826/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1411 - mean_squared_error: 0.14116/6 [======
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1364 - mean_squared_error: 0.13646/6 [======
Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1408 - mean_squared_error: 0.14086/6 [======
Epoch 24/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1449 - mean_squared_error: 0.14496/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1120 - mean_squared_error: 0.11206/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1448 - mean_squared_error: 0.14486/6 [======
Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1116 - mean_squared_error: 0.11166/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1485 - mean_squared_error: 0.14856/6 [======
Epoch 29/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1508 - mean_squared_error: 0.15086/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1108 - mean_squared_error: 0.11086/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1798 - mean_squared_error: 0.17986/6 [======
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1153 - mean_squared_error: 0.11536/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1273 - mean_squared_error: 0.12736/6 [======
Epoch 34/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1582 - mean_squared_error: 0.15826/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1049 - mean_squared_error: 0.10496/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0868 - mean_squared_error: 0.08686/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1134 - mean_squared_error: 0.11346/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1458 - mean_squared_error: 0.14586/6 [======
Epoch 39/150
```

```
1/6 [====>........................] - ETA: 0s - loss: 0.1161 - mean_squared_error: 0.11616/6 [======
Epoch 40/150
1/6 [====>........................] - ETA: 0s - loss: 0.1113 - mean_squared_error: 0.11136/6 [======
Epoch 41/150
1/6 [====>........................] - ETA: 0s - loss: 0.1350 - mean_squared_error: 0.13506/6 [======
Epoch 42/150
1/6 [====>........................] - ETA: 0s - loss: 0.0992 - mean_squared_error: 0.09926/6 [======
Epoch 43/150
1/6 [====>........................] - ETA: 0s - loss: 0.1607 - mean_squared_error: 0.16076/6 [======
Epoch 44/150
1/6 [====>........................] - ETA: 0s - loss: 0.1445 - mean_squared_error: 0.14456/6 [======
Epoch 45/150
1/6 [====>........................] - ETA: 0s - loss: 0.1055 - mean_squared_error: 0.10556/6 [======
Epoch 46/150
1/6 [====>........................] - ETA: 0s - loss: 0.1508 - mean_squared_error: 0.15086/6 [======
Epoch 47/150
1/6 [====>........................] - ETA: 0s - loss: 0.0936 - mean_squared_error: 0.09366/6 [======
Epoch 48/150
1/6 [====>........................] - ETA: 0s - loss: 0.0903 - mean_squared_error: 0.09036/6 [======
Epoch 49/150
1/6 [====>........................] - ETA: 0s - loss: 0.0770 - mean_squared_error: 0.07706/6 [======
Epoch 50/150
1/6 [====>........................] - ETA: 0s - loss: 0.1139 - mean_squared_error: 0.11396/6 [======
Epoch 51/150
1/6 [====>........................] - ETA: 0s - loss: 0.1071 - mean_squared_error: 0.10716/6 [======
Epoch 52/150
1/6 [====>........................] - ETA: 0s - loss: 0.1496 - mean_squared_error: 0.14966/6 [======
Epoch 53/150
1/6 [====>........................] - ETA: 0s - loss: 0.0974 - mean_squared_error: 0.09746/6 [======
Epoch 54/150
1/6 [====>........................] - ETA: 0s - loss: 0.1355 - mean_squared_error: 0.13556/6 [======
Epoch 55/150
1/6 [====>........................] - ETA: 0s - loss: 0.0979 - mean_squared_error: 0.09796/6 [======
Epoch 56/150
1/6 [====>........................] - ETA: 0s - loss: 0.1356 - mean_squared_error: 0.13566/6 [======
Epoch 57/150
1/6 [====>........................] - ETA: 0s - loss: 0.0898 - mean_squared_error: 0.08986/6 [======
Epoch 58/150
1/6 [====>........................] - ETA: 0s - loss: 0.0659 - mean_squared_error: 0.06596/6 [======
Epoch 59/150
1/6 [====>........................] - ETA: 0s - loss: 0.0867 - mean_squared_error: 0.08676/6 [======
Epoch 60/150
1/6 [====>........................] - ETA: 0s - loss: 0.1201 - mean_squared_error: 0.12016/6 [======
Epoch 61/150
1/6 [====>........................] - ETA: 0s - loss: 0.0780 - mean_squared_error: 0.07806/6 [======
Epoch 62/150
1/6 [====>........................] - ETA: 0s - loss: 0.0718 - mean_squared_error: 0.07186/6 [======
Epoch 63/150
1/6 [====>........................] - ETA: 0s - loss: 0.1303 - mean_squared_error: 0.13036/6 [======
Epoch 64/150
1/6 [====>........................] - ETA: 0s - loss: 0.0680 - mean_squared_error: 0.06806/6 [======
Epoch 65/150
1/6 [====>........................] - ETA: 0s - loss: 0.1289 - mean_squared_error: 0.12896/6 [======
Epoch 66/150
1/6 [====>........................] - ETA: 0s - loss: 0.1241 - mean_squared_error: 0.12416/6 [======
Epoch 67/150
1/6 [====>........................] - ETA: 0s - loss: 0.1067 - mean_squared_error: 0.10676/6 [======
Epoch 68/150
1/6 [====>........................] - ETA: 0s - loss: 0.1103 - mean_squared_error: 0.11036/6 [======
Epoch 69/150
1/6 [====>........................] - ETA: 0s - loss: 0.1289 - mean_squared_error: 0.12896/6 [======
Epoch 70/150
1/6 [====>........................] - ETA: 0s - loss: 0.0610 - mean_squared_error: 0.06106/6 [======
Epoch 71/150
1/6 [====>........................] - ETA: 0s - loss: 0.0786 - mean_squared_error: 0.07866/6 [======
Epoch 72/150
1/6 [====>........................] - ETA: 0s - loss: 0.0813 - mean_squared_error: 0.08136/6 [======
Epoch 73/150
1/6 [====>........................] - ETA: 0s - loss: 0.1031 - mean_squared_error: 0.10316/6 [======
Epoch 74/150
1/6 [====>........................] - ETA: 0s - loss: 0.1067 - mean_squared_error: 0.10676/6 [======
```

```
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0720 - mean_squared_error: 0.07206/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1189 - mean_squared_error: 0.11896/6 [======
Epoch 77/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1150 - mean_squared_error: 0.11506/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0970 - mean_squared_error: 0.09706/6 [======
Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1187 - mean_squared_error: 0.11876/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0562 - mean_squared_error: 0.05626/6 [======
Epoch 81/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0900 - mean_squared_error: 0.09006/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0878 - mean_squared_error: 0.08786/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0813 - mean_squared_error: 0.08136/6 [======
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1166 - mean_squared_error: 0.11666/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0652 - mean_squared_error: 0.06526/6 [======
Epoch 86/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1067 - mean_squared_error: 0.10676/6 [======
Epoch 87/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0801 - mean_squared_error: 0.08016/6 [======
Epoch 88/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1493 - mean_squared_error: 0.14936/6 [======
Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0675 - mean_squared_error: 0.06756/6 [======
Epoch 90/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0915 - mean_squared_error: 0.09156/6 [======
Epoch 91/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1130 - mean_squared_error: 0.11306/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0969 - mean_squared_error: 0.09696/6 [======
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0881 - mean_squared_error: 0.08816/6 [======
Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1069 - mean_squared_error: 0.10696/6 [======
Epoch 95/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0618 - mean_squared_error: 0.06186/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0930 - mean_squared_error: 0.09306/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1206 - mean_squared_error: 0.12066/6 [======
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1337 - mean_squared_error: 0.13376/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0957 - mean_squared_error: 0.09576/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0890 - mean_squared_error: 0.08906/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0663 - mean_squared_error: 0.06636/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0654 - mean_squared_error: 0.06546/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0538 - mean_squared_error: 0.05386/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1161 - mean_squared_error: 0.11616/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0606 - mean_squared_error: 0.06066/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0931 - mean_squared_error: 0.09316/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0768 - mean_squared_error: 0.07686/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0927 - mean_squared_error: 0.09276/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0617 - mean_squared_error: 0.06176/6 [======
Epoch 110/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.0880 - mean_squared_error: 0.08806/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1125 - mean_squared_error: 0.11256/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0736 - mean_squared_error: 0.07366/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0952 - mean_squared_error: 0.09526/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0716 - mean_squared_error: 0.07166/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0876 - mean_squared_error: 0.08766/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0966 - mean_squared_error: 0.09666/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0720 - mean_squared_error: 0.07206/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0567 - mean_squared_error: 0.05676/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0438 - mean_squared_error: 0.04386/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0233 - mean_squared_error: 0.02336/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0816 - mean_squared_error: 0.08166/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0998 - mean_squared_error: 0.09986/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0525 - mean_squared_error: 0.05256/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0571 - mean_squared_error: 0.05716/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0658 - mean_squared_error: 0.06586/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1018 - mean_squared_error: 0.10186/6 [======
Epoch 127/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0692 - mean_squared_error: 0.06926/6 [======
Epoch 128/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0552 - mean_squared_error: 0.05526/6 [======
Epoch 129/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0665 - mean_squared_error: 0.06656/6 [======
Epoch 130/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0861 - mean_squared_error: 0.08616/6 [======
Epoch 131/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0666 - mean_squared_error: 0.06666/6 [======
Epoch 132/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0955 - mean_squared_error: 0.09556/6 [======
Epoch 133/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0550 - mean_squared_error: 0.05506/6 [======
Epoch 134/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1034 - mean_squared_error: 0.10346/6 [======
Epoch 135/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1680 - mean_squared_error: 0.16806/6 [======
Epoch 136/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0353 - mean_squared_error: 0.03536/6 [======
Epoch 137/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0899 - mean_squared_error: 0.08996/6 [======
Epoch 138/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0552 - mean_squared_error: 0.05526/6 [======
Epoch 139/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1115 - mean_squared_error: 0.11156/6 [======
Epoch 140/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0515 - mean_squared_error: 0.05156/6 [======
Epoch 141/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1187 - mean_squared_error: 0.11876/6 [======
Epoch 142/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0707 - mean_squared_error: 0.07076/6 [======
Epoch 143/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0831 - mean_squared_error: 0.08316/6 [======
Epoch 144/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0822 - mean_squared_error: 0.08226/6 [======
Epoch 145/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0670 - mean_squared_error: 0.06706/6 [======
```

```
Epoch 146/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0330 - mean_squared_error: 0.03306/6 [======
Epoch 147/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0729 - mean_squared_error: 0.07296/6 [======
Epoch 148/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0604 - mean_squared_error: 0.06046/6 [======
Epoch 149/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0902 - mean_squared_error: 0.09026/6 [======
Epoch 150/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0800 - mean_squared_error: 0.08006/6 [======
```

```
MSE on Train Set for Training Model # 34  =  0.08469216600912136

MSE on Test Set for Training Model # 34  =  0.10434705025323822

              precision    recall  f1-score   support

          0       0.79      0.88      0.83        25
          1       0.91      0.83      0.87        36

   accuracy                           0.85        61
  macro avg       0.85      0.86      0.85        61
weighted avg      0.86      0.85      0.85        61
```

```
Training Model #  35
```

```
Epoch 1/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2681 - mean_squared_error: 0.26816/6 [======
Epoch 2/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2567 - mean_squared_error: 0.25676/6 [======
Epoch 3/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2551 - mean_squared_error: 0.25516/6 [======
Epoch 4/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2448 - mean_squared_error: 0.24486/6 [======
Epoch 5/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2519 - mean_squared_error: 0.25196/6 [======
Epoch 6/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2569 - mean_squared_error: 0.25696/6 [======
Epoch 7/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2538 - mean_squared_error: 0.25386/6 [======
Epoch 8/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2474 - mean_squared_error: 0.24746/6 [======
Epoch 9/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2439 - mean_squared_error: 0.24396/6 [======
Epoch 10/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2369 - mean_squared_error: 0.23696/6 [======
Epoch 11/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2223 - mean_squared_error: 0.22236/6 [======
Epoch 12/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2205 - mean_squared_error: 0.22056/6 [======
Epoch 13/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2173 - mean_squared_error: 0.21736/6 [======
Epoch 14/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2054 - mean_squared_error: 0.20546/6 [======
Epoch 15/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2070 - mean_squared_error: 0.20706/6 [======
Epoch 16/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1969 - mean_squared_error: 0.19696/6 [======
Epoch 17/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1924 - mean_squared_error: 0.19246/6 [======
Epoch 18/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1982 - mean_squared_error: 0.19826/6 [======
Epoch 19/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1985 - mean_squared_error: 0.19856/6 [======
Epoch 20/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.1851 - mean_squared_error: 0.18516/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1942 - mean_squared_error: 0.19426/6 [======
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1812 - mean_squared_error: 0.18126/6 [======
Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2108 - mean_squared_error: 0.21086/6 [======
Epoch 24/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1567 - mean_squared_error: 0.15676/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1595 - mean_squared_error: 0.15956/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1555 - mean_squared_error: 0.15556/6 [======
Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1810 - mean_squared_error: 0.18106/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1391 - mean_squared_error: 0.13916/6 [======
Epoch 29/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1857 - mean_squared_error: 0.18576/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1670 - mean_squared_error: 0.16706/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1431 - mean_squared_error: 0.14316/6 [======
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1962 - mean_squared_error: 0.19626/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1202 - mean_squared_error: 0.12026/6 [======
Epoch 34/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1591 - mean_squared_error: 0.15916/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1206 - mean_squared_error: 0.12066/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1446 - mean_squared_error: 0.14466/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1553 - mean_squared_error: 0.15536/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0854 - mean_squared_error: 0.08546/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1191 - mean_squared_error: 0.11916/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1048 - mean_squared_error: 0.10486/6 [======
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0866 - mean_squared_error: 0.08666/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1450 - mean_squared_error: 0.14506/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1192 - mean_squared_error: 0.11926/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1040 - mean_squared_error: 0.10406/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1496 - mean_squared_error: 0.14966/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1456 - mean_squared_error: 0.14566/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1247 - mean_squared_error: 0.12476/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1280 - mean_squared_error: 0.12806/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1018 - mean_squared_error: 0.10186/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0928 - mean_squared_error: 0.09286/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0942 - mean_squared_error: 0.09426/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0869 - mean_squared_error: 0.08696/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1106 - mean_squared_error: 0.11066/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1396 - mean_squared_error: 0.13966/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1058 - mean_squared_error: 0.10586/6 [======
```

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Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1270 - mean_squared_error: 0.12706/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0865 - mean_squared_error: 0.08656/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1556 - mean_squared_error: 0.15566/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0956 - mean_squared_error: 0.09566/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1009 - mean_squared_error: 0.10096/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1617 - mean_squared_error: 0.16176/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1971 - mean_squared_error: 0.19716/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1007 - mean_squared_error: 0.10076/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0751 - mean_squared_error: 0.07516/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1359 - mean_squared_error: 0.13596/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1162 - mean_squared_error: 0.11626/6 [======
Epoch 67/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1124 - mean_squared_error: 0.11246/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1092 - mean_squared_error: 0.10926/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0859 - mean_squared_error: 0.08596/6 [======
Epoch 70/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1046 - mean_squared_error: 0.10466/6 [======
Epoch 71/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0818 - mean_squared_error: 0.08186/6 [======
Epoch 72/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0959 - mean_squared_error: 0.09596/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1187 - mean_squared_error: 0.11876/6 [======
Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0539 - mean_squared_error: 0.05396/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0731 - mean_squared_error: 0.07316/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0930 - mean_squared_error: 0.09306/6 [======
Epoch 77/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1024 - mean_squared_error: 0.10246/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1788 - mean_squared_error: 0.17886/6 [======
Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1174 - mean_squared_error: 0.11746/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1068 - mean_squared_error: 0.10686/6 [======
Epoch 81/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0686 - mean_squared_error: 0.06866/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0962 - mean_squared_error: 0.09626/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1052 - mean_squared_error: 0.10526/6 [======
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1392 - mean_squared_error: 0.13926/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0842 - mean_squared_error: 0.08426/6 [======
Epoch 86/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1325 - mean_squared_error: 0.13256/6 [======
Epoch 87/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1196 - mean_squared_error: 0.11966/6 [======
Epoch 88/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1248 - mean_squared_error: 0.12486/6 [======
Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0358 - mean_squared_error: 0.03586/6 [======
Epoch 90/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0558 - mean_squared_error: 0.05586/6 [======
Epoch 91/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.0694 - mean_squared_error: 0.06946/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1327 - mean_squared_error: 0.13276/6 [======
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0873 - mean_squared_error: 0.08736/6 [======
Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0900 - mean_squared_error: 0.09006/6 [======
Epoch 95/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0891 - mean_squared_error: 0.08916/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1069 - mean_squared_error: 0.10696/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0731 - mean_squared_error: 0.07316/6 [======
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0838 - mean_squared_error: 0.08386/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0742 - mean_squared_error: 0.07426/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0939 - mean_squared_error: 0.09396/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0616 - mean_squared_error: 0.06166/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0554 - mean_squared_error: 0.05546/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0824 - mean_squared_error: 0.08246/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0986 - mean_squared_error: 0.09866/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0839 - mean_squared_error: 0.08396/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1388 - mean_squared_error: 0.13886/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0933 - mean_squared_error: 0.09336/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0484 - mean_squared_error: 0.04846/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1387 - mean_squared_error: 0.13876/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0646 - mean_squared_error: 0.06466/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0614 - mean_squared_error: 0.06146/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0928 - mean_squared_error: 0.09286/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1029 - mean_squared_error: 0.10296/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0450 - mean_squared_error: 0.04506/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1009 - mean_squared_error: 0.10096/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0632 - mean_squared_error: 0.06326/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0732 - mean_squared_error: 0.07326/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0328 - mean_squared_error: 0.03286/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0802 - mean_squared_error: 0.08026/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0923 - mean_squared_error: 0.09236/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0982 - mean_squared_error: 0.09826/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0617 - mean_squared_error: 0.06176/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0430 - mean_squared_error: 0.04306/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1258 - mean_squared_error: 0.12586/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0558 - mean_squared_error: 0.05586/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0948 - mean_squared_error: 0.09486/6 [======
```

```
Epoch 127/150
1/6 [====>......................] - ETA: 0s - loss: 0.0745 - mean_squared_error: 0.07456/6 [======
Epoch 128/150
1/6 [====>......................] - ETA: 0s - loss: 0.0887 - mean_squared_error: 0.08876/6 [======
Epoch 129/150
1/6 [====>......................] - ETA: 0s - loss: 0.1289 - mean_squared_error: 0.12896/6 [======
Epoch 130/150
1/6 [====>......................] - ETA: 0s - loss: 0.0250 - mean_squared_error: 0.02506/6 [======
Epoch 131/150
1/6 [====>......................] - ETA: 0s - loss: 0.1096 - mean_squared_error: 0.10966/6 [======
Epoch 132/150
1/6 [====>......................] - ETA: 0s - loss: 0.1041 - mean_squared_error: 0.10416/6 [======
Epoch 133/150
1/6 [====>......................] - ETA: 0s - loss: 0.1016 - mean_squared_error: 0.10166/6 [======
Epoch 134/150
1/6 [====>......................] - ETA: 0s - loss: 0.1280 - mean_squared_error: 0.12806/6 [======
Epoch 135/150
1/6 [====>......................] - ETA: 0s - loss: 0.1165 - mean_squared_error: 0.11656/6 [======
Epoch 136/150
1/6 [====>......................] - ETA: 0s - loss: 0.0994 - mean_squared_error: 0.09946/6 [======
Epoch 137/150
1/6 [====>......................] - ETA: 0s - loss: 0.0745 - mean_squared_error: 0.07456/6 [======
Epoch 138/150
1/6 [====>......................] - ETA: 0s - loss: 0.0665 - mean_squared_error: 0.06656/6 [======
Epoch 139/150
1/6 [====>......................] - ETA: 0s - loss: 0.1155 - mean_squared_error: 0.11556/6 [======
Epoch 140/150
1/6 [====>......................] - ETA: 0s - loss: 0.0467 - mean_squared_error: 0.04676/6 [======
Epoch 141/150
1/6 [====>......................] - ETA: 0s - loss: 0.0757 - mean_squared_error: 0.07576/6 [======
Epoch 142/150
1/6 [====>......................] - ETA: 0s - loss: 0.0666 - mean_squared_error: 0.06666/6 [======
Epoch 143/150
1/6 [====>......................] - ETA: 0s - loss: 0.0827 - mean_squared_error: 0.08276/6 [======
Epoch 144/150
1/6 [====>......................] - ETA: 0s - loss: 0.0369 - mean_squared_error: 0.03696/6 [======
Epoch 145/150
1/6 [====>......................] - ETA: 0s - loss: 0.0546 - mean_squared_error: 0.05466/6 [======
Epoch 146/150
1/6 [====>......................] - ETA: 0s - loss: 0.0926 - mean_squared_error: 0.09266/6 [======
Epoch 147/150
1/6 [====>......................] - ETA: 0s - loss: 0.1085 - mean_squared_error: 0.10856/6 [======
Epoch 148/150
1/6 [====>......................] - ETA: 0s - loss: 0.0430 - mean_squared_error: 0.04306/6 [======
Epoch 149/150
1/6 [====>......................] - ETA: 0s - loss: 0.0771 - mean_squared_error: 0.07716/6 [======
Epoch 150/150
1/6 [====>......................] - ETA: 0s - loss: 0.0147 - mean_squared_error: 0.01476/6 [======
```

```
MSE on Train Set for Training Model # 35  =  0.08970497414279296

MSE on Test Set for Training Model # 35  =  0.09942784996721613

           precision    recall  f1-score   support

        0       0.82      0.92      0.87        25
        1       0.94      0.86      0.90        36

 accuracy                           0.89        61
macro avg       0.88      0.89      0.88        61
weighted avg       0.89      0.89      0.89        61




Training Model #  36


Epoch 1/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.2371 - mean_squared_error: 0.23716/6 [======
Epoch 2/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2529 - mean_squared_error: 0.25296/6 [======
Epoch 3/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2307 - mean_squared_error: 0.23076/6 [======
Epoch 4/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2406 - mean_squared_error: 0.24066/6 [======
Epoch 5/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2436 - mean_squared_error: 0.24366/6 [======
Epoch 6/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1918 - mean_squared_error: 0.19186/6 [======
Epoch 7/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2066 - mean_squared_error: 0.20666/6 [======
Epoch 8/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2162 - mean_squared_error: 0.21626/6 [======
Epoch 9/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2104 - mean_squared_error: 0.21046/6 [======
Epoch 10/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1902 - mean_squared_error: 0.19026/6 [======
Epoch 11/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1919 - mean_squared_error: 0.19196/6 [======
Epoch 12/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2058 - mean_squared_error: 0.20586/6 [======
Epoch 13/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1869 - mean_squared_error: 0.18696/6 [======
Epoch 14/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1901 - mean_squared_error: 0.19016/6 [======
Epoch 15/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2019 - mean_squared_error: 0.20196/6 [======
Epoch 16/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1498 - mean_squared_error: 0.14986/6 [======
Epoch 17/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1745 - mean_squared_error: 0.17456/6 [======
Epoch 18/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1619 - mean_squared_error: 0.16196/6 [======
Epoch 19/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1701 - mean_squared_error: 0.17016/6 [======
Epoch 20/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1575 - mean_squared_error: 0.15756/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1368 - mean_squared_error: 0.13686/6 [======
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1324 - mean_squared_error: 0.13246/6 [======
Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1272 - mean_squared_error: 0.12726/6 [======
Epoch 24/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1231 - mean_squared_error: 0.12316/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1358 - mean_squared_error: 0.13586/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1437 - mean_squared_error: 0.14376/6 [======
Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1529 - mean_squared_error: 0.15296/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1661 - mean_squared_error: 0.16616/6 [======
Epoch 29/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1335 - mean_squared_error: 0.13356/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1399 - mean_squared_error: 0.13996/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1134 - mean_squared_error: 0.11346/6 [======
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1254 - mean_squared_error: 0.12546/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1604 - mean_squared_error: 0.16046/6 [======
Epoch 34/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1960 - mean_squared_error: 0.19606/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1490 - mean_squared_error: 0.14906/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1213 - mean_squared_error: 0.12136/6 [======
```

```
Epoch 37/150
1/6 [====>........................] - ETA: 0s - loss: 0.1710 - mean_squared_error: 0.17106/6 [======
Epoch 38/150
1/6 [====>........................] - ETA: 0s - loss: 0.1416 - mean_squared_error: 0.14166/6 [======
Epoch 39/150
1/6 [====>........................] - ETA: 0s - loss: 0.1429 - mean_squared_error: 0.14296/6 [======
Epoch 40/150
1/6 [====>........................] - ETA: 0s - loss: 0.1150 - mean_squared_error: 0.11506/6 [======
Epoch 41/150
1/6 [====>........................] - ETA: 0s - loss: 0.0904 - mean_squared_error: 0.09046/6 [======
Epoch 42/150
1/6 [====>........................] - ETA: 0s - loss: 0.0931 - mean_squared_error: 0.09316/6 [======
Epoch 43/150
1/6 [====>........................] - ETA: 0s - loss: 0.1379 - mean_squared_error: 0.13796/6 [======
Epoch 44/150
1/6 [====>........................] - ETA: 0s - loss: 0.1453 - mean_squared_error: 0.14536/6 [======
Epoch 45/150
1/6 [====>........................] - ETA: 0s - loss: 0.1151 - mean_squared_error: 0.11516/6 [======
Epoch 46/150
1/6 [====>........................] - ETA: 0s - loss: 0.1536 - mean_squared_error: 0.15366/6 [======
Epoch 47/150
1/6 [====>........................] - ETA: 0s - loss: 0.0864 - mean_squared_error: 0.08646/6 [======
Epoch 48/150
1/6 [====>........................] - ETA: 0s - loss: 0.1061 - mean_squared_error: 0.10616/6 [======
Epoch 49/150
1/6 [====>........................] - ETA: 0s - loss: 0.1103 - mean_squared_error: 0.11036/6 [======
Epoch 50/150
1/6 [====>........................] - ETA: 0s - loss: 0.1033 - mean_squared_error: 0.10336/6 [======
Epoch 51/150
1/6 [====>........................] - ETA: 0s - loss: 0.0926 - mean_squared_error: 0.09266/6 [======
Epoch 52/150
1/6 [====>........................] - ETA: 0s - loss: 0.1410 - mean_squared_error: 0.14106/6 [======
Epoch 53/150
1/6 [====>........................] - ETA: 0s - loss: 0.0970 - mean_squared_error: 0.09706/6 [======
Epoch 54/150
1/6 [====>........................] - ETA: 0s - loss: 0.1163 - mean_squared_error: 0.11636/6 [======
Epoch 55/150
1/6 [====>........................] - ETA: 0s - loss: 0.0963 - mean_squared_error: 0.09636/6 [======
Epoch 56/150
1/6 [====>........................] - ETA: 0s - loss: 0.0753 - mean_squared_error: 0.07536/6 [======
Epoch 57/150
1/6 [====>........................] - ETA: 0s - loss: 0.1584 - mean_squared_error: 0.15846/6 [======
Epoch 58/150
1/6 [====>........................] - ETA: 0s - loss: 0.1053 - mean_squared_error: 0.10536/6 [======
Epoch 59/150
1/6 [====>........................] - ETA: 0s - loss: 0.0925 - mean_squared_error: 0.09256/6 [======
Epoch 60/150
1/6 [====>........................] - ETA: 0s - loss: 0.1193 - mean_squared_error: 0.11936/6 [======
Epoch 61/150
1/6 [====>........................] - ETA: 0s - loss: 0.0795 - mean_squared_error: 0.07956/6 [======
Epoch 62/150
1/6 [====>........................] - ETA: 0s - loss: 0.1445 - mean_squared_error: 0.14456/6 [======
Epoch 63/150
1/6 [====>........................] - ETA: 0s - loss: 0.1374 - mean_squared_error: 0.13746/6 [======
Epoch 64/150
1/6 [====>........................] - ETA: 0s - loss: 0.1464 - mean_squared_error: 0.14646/6 [======
Epoch 65/150
1/6 [====>........................] - ETA: 0s - loss: 0.1067 - mean_squared_error: 0.10676/6 [======
Epoch 66/150
1/6 [====>........................] - ETA: 0s - loss: 0.1025 - mean_squared_error: 0.10256/6 [======
Epoch 67/150
1/6 [====>........................] - ETA: 0s - loss: 0.1168 - mean_squared_error: 0.11686/6 [======
Epoch 68/150
1/6 [====>........................] - ETA: 0s - loss: 0.0545 - mean_squared_error: 0.05456/6 [======
Epoch 69/150
1/6 [====>........................] - ETA: 0s - loss: 0.0977 - mean_squared_error: 0.09776/6 [======
Epoch 70/150
1/6 [====>........................] - ETA: 0s - loss: 0.0547 - mean_squared_error: 0.05476/6 [======
Epoch 71/150
1/6 [====>........................] - ETA: 0s - loss: 0.0653 - mean_squared_error: 0.06536/6 [======
Epoch 72/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.1133 - mean_squared_error: 0.11336/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1093 - mean_squared_error: 0.10936/6 [======
Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1111 - mean_squared_error: 0.11116/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0730 - mean_squared_error: 0.07306/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0969 - mean_squared_error: 0.09696/6 [======
Epoch 77/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1196 - mean_squared_error: 0.11966/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1240 - mean_squared_error: 0.12406/6 [======
Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0856 - mean_squared_error: 0.08566/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1283 - mean_squared_error: 0.12836/6 [======
Epoch 81/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0541 - mean_squared_error: 0.05416/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0645 - mean_squared_error: 0.06456/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0880 - mean_squared_error: 0.08806/6 [======
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0783 - mean_squared_error: 0.07836/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0830 - mean_squared_error: 0.08306/6 [======
Epoch 86/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0664 - mean_squared_error: 0.06646/6 [======
Epoch 87/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0957 - mean_squared_error: 0.09576/6 [======
Epoch 88/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0376 - mean_squared_error: 0.03766/6 [======
Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1029 - mean_squared_error: 0.10296/6 [======
Epoch 90/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0883 - mean_squared_error: 0.08836/6 [======
Epoch 91/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0295 - mean_squared_error: 0.02956/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0962 - mean_squared_error: 0.09626/6 [======
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0917 - mean_squared_error: 0.09176/6 [======
Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0886 - mean_squared_error: 0.08866/6 [======
Epoch 95/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0813 - mean_squared_error: 0.08136/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0819 - mean_squared_error: 0.08196/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0451 - mean_squared_error: 0.04516/6 [======
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0856 - mean_squared_error: 0.08566/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0244 - mean_squared_error: 0.02446/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1662 - mean_squared_error: 0.16626/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0752 - mean_squared_error: 0.07526/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0997 - mean_squared_error: 0.09976/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1222 - mean_squared_error: 0.12226/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0549 - mean_squared_error: 0.05496/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0786 - mean_squared_error: 0.07866/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0942 - mean_squared_error: 0.09426/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0992 - mean_squared_error: 0.09926/6 [======
```

```
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1066 - mean_squared_error: 0.10666/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0684 - mean_squared_error: 0.06846/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0310 - mean_squared_error: 0.03106/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0652 - mean_squared_error: 0.06526/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0881 - mean_squared_error: 0.08816/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0572 - mean_squared_error: 0.05726/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0834 - mean_squared_error: 0.08346/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0982 - mean_squared_error: 0.09826/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0870 - mean_squared_error: 0.08706/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0761 - mean_squared_error: 0.07616/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0619 - mean_squared_error: 0.06196/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0827 - mean_squared_error: 0.08276/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1019 - mean_squared_error: 0.10196/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0543 - mean_squared_error: 0.05436/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0570 - mean_squared_error: 0.05706/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0935 - mean_squared_error: 0.09356/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0817 - mean_squared_error: 0.08176/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1419 - mean_squared_error: 0.14196/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0883 - mean_squared_error: 0.08836/6 [======
Epoch 127/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0764 - mean_squared_error: 0.07646/6 [======
Epoch 128/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1047 - mean_squared_error: 0.10476/6 [======
Epoch 129/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0463 - mean_squared_error: 0.04636/6 [======
Epoch 130/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0642 - mean_squared_error: 0.06426/6 [======
Epoch 131/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0362 - mean_squared_error: 0.03626/6 [======
Epoch 132/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0954 - mean_squared_error: 0.09546/6 [======
Epoch 133/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0490 - mean_squared_error: 0.04906/6 [======
Epoch 134/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0948 - mean_squared_error: 0.09486/6 [======
Epoch 135/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0649 - mean_squared_error: 0.06496/6 [======
Epoch 136/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0520 - mean_squared_error: 0.05206/6 [======
Epoch 137/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0887 - mean_squared_error: 0.08876/6 [======
Epoch 138/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0519 - mean_squared_error: 0.05196/6 [======
Epoch 139/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0634 - mean_squared_error: 0.06346/6 [======
Epoch 140/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0396 - mean_squared_error: 0.03966/6 [======
Epoch 141/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0858 - mean_squared_error: 0.08586/6 [======
Epoch 142/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0454 - mean_squared_error: 0.04546/6 [======
Epoch 143/150
```

```
1/6 [====>........................] - ETA: 0s - loss: 0.0433 - mean_squared_error: 0.04336/6 [======
Epoch 144/150
1/6 [====>........................] - ETA: 0s - loss: 0.0706 - mean_squared_error: 0.07066/6 [======
Epoch 145/150
1/6 [====>........................] - ETA: 0s - loss: 0.0867 - mean_squared_error: 0.08676/6 [======
Epoch 146/150
1/6 [====>........................] - ETA: 0s - loss: 0.0445 - mean_squared_error: 0.04456/6 [======
Epoch 147/150
1/6 [====>........................] - ETA: 0s - loss: 0.0639 - mean_squared_error: 0.06396/6 [======
Epoch 148/150
1/6 [====>........................] - ETA: 0s - loss: 0.0202 - mean_squared_error: 0.02026/6 [======
Epoch 149/150
1/6 [====>........................] - ETA: 0s - loss: 0.0313 - mean_squared_error: 0.03136/6 [======
Epoch 150/150
1/6 [====>........................] - ETA: 0s - loss: 0.0310 - mean_squared_error: 0.03106/6 [======
```

```
MSE on Train Set for Training Model # 36  =  0.0821419827025262

MSE on Test Set for Training Model # 36  =  0.08642848970182092
```

```
              precision    recall  f1-score   support

         0       0.91      0.84      0.87        25
         1       0.89      0.94      0.92        36

  accuracy                           0.90        61
 macro avg       0.90      0.89      0.90        61
weighted avg     0.90      0.90      0.90        61
```

```
Training Model #  37


Epoch 1/150
1/6 [====>........................] - ETA: 0s - loss: 0.2550 - mean_squared_error: 0.25506/6 [======
Epoch 2/150
1/6 [====>........................] - ETA: 0s - loss: 0.2495 - mean_squared_error: 0.24956/6 [======
Epoch 3/150
1/6 [====>........................] - ETA: 0s - loss: 0.2610 - mean_squared_error: 0.26106/6 [======
Epoch 4/150
1/6 [====>........................] - ETA: 0s - loss: 0.2132 - mean_squared_error: 0.21326/6 [======
Epoch 5/150
1/6 [====>........................] - ETA: 0s - loss: 0.2196 - mean_squared_error: 0.21966/6 [======
Epoch 6/150
1/6 [====>........................] - ETA: 0s - loss: 0.2167 - mean_squared_error: 0.21676/6 [======
Epoch 7/150
1/6 [====>........................] - ETA: 0s - loss: 0.2073 - mean_squared_error: 0.20736/6 [======
Epoch 8/150
1/6 [====>........................] - ETA: 0s - loss: 0.1632 - mean_squared_error: 0.16326/6 [======
Epoch 9/150
1/6 [====>........................] - ETA: 0s - loss: 0.1870 - mean_squared_error: 0.18706/6 [======
Epoch 10/150
1/6 [====>........................] - ETA: 0s - loss: 0.1779 - mean_squared_error: 0.17796/6 [======
Epoch 11/150
1/6 [====>........................] - ETA: 0s - loss: 0.1518 - mean_squared_error: 0.15186/6 [======
Epoch 12/150
1/6 [====>........................] - ETA: 0s - loss: 0.1813 - mean_squared_error: 0.18136/6 [======
Epoch 13/150
1/6 [====>........................] - ETA: 0s - loss: 0.1812 - mean_squared_error: 0.18126/6 [======
Epoch 14/150
1/6 [====>........................] - ETA: 0s - loss: 0.2030 - mean_squared_error: 0.20306/6 [======
Epoch 15/150
1/6 [====>........................] - ETA: 0s - loss: 0.1804 - mean_squared_error: 0.18046/6 [======
Epoch 16/150
1/6 [====>........................] - ETA: 0s - loss: 0.1556 - mean_squared_error: 0.15566/6 [======
Epoch 17/150
1/6 [====>........................] - ETA: 0s - loss: 0.1512 - mean_squared_error: 0.15126/6 [======
```

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Epoch 18/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1760 - mean_squared_error: 0.17606/6 [======
Epoch 19/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1472 - mean_squared_error: 0.14726/6 [======
Epoch 20/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1753 - mean_squared_error: 0.17536/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1619 - mean_squared_error: 0.16196/6 [======
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1412 - mean_squared_error: 0.14126/6 [======
Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1959 - mean_squared_error: 0.19596/6 [======
Epoch 24/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1696 - mean_squared_error: 0.16966/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1084 - mean_squared_error: 0.10846/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1613 - mean_squared_error: 0.16136/6 [======
Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1570 - mean_squared_error: 0.15706/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1757 - mean_squared_error: 0.17576/6 [======
Epoch 29/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1241 - mean_squared_error: 0.12416/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1505 - mean_squared_error: 0.15056/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1166 - mean_squared_error: 0.11666/6 [======
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1348 - mean_squared_error: 0.13486/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0952 - mean_squared_error: 0.09526/6 [======
Epoch 34/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1185 - mean_squared_error: 0.11856/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1165 - mean_squared_error: 0.11656/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1403 - mean_squared_error: 0.14036/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1416 - mean_squared_error: 0.14166/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1122 - mean_squared_error: 0.11226/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1163 - mean_squared_error: 0.11636/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1172 - mean_squared_error: 0.11726/6 [======
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1235 - mean_squared_error: 0.12356/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0935 - mean_squared_error: 0.09356/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1713 - mean_squared_error: 0.17136/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1123 - mean_squared_error: 0.11236/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1324 - mean_squared_error: 0.13246/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0888 - mean_squared_error: 0.08886/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0726 - mean_squared_error: 0.07266/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1606 - mean_squared_error: 0.16066/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1294 - mean_squared_error: 0.12946/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0922 - mean_squared_error: 0.09226/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1520 - mean_squared_error: 0.15206/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1020 - mean_squared_error: 0.10206/6 [======
Epoch 53/150
```

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1/6 [====>........................] - ETA: 0s - loss: 0.1717 - mean_squared_error: 0.17176/6 [======
Epoch 54/150
1/6 [====>........................] - ETA: 0s - loss: 0.1301 - mean_squared_error: 0.13016/6 [======
Epoch 55/150
1/6 [====>........................] - ETA: 0s - loss: 0.1027 - mean_squared_error: 0.10276/6 [======
Epoch 56/150
1/6 [====>........................] - ETA: 0s - loss: 0.1394 - mean_squared_error: 0.13946/6 [======
Epoch 57/150
1/6 [====>........................] - ETA: 0s - loss: 0.1276 - mean_squared_error: 0.12766/6 [======
Epoch 58/150
1/6 [====>........................] - ETA: 0s - loss: 0.1434 - mean_squared_error: 0.14346/6 [======
Epoch 59/150
1/6 [====>........................] - ETA: 0s - loss: 0.1525 - mean_squared_error: 0.15256/6 [======
Epoch 60/150
1/6 [====>........................] - ETA: 0s - loss: 0.1551 - mean_squared_error: 0.15516/6 [======
Epoch 61/150
1/6 [====>........................] - ETA: 0s - loss: 0.0956 - mean_squared_error: 0.09566/6 [======
Epoch 62/150
1/6 [====>........................] - ETA: 0s - loss: 0.1189 - mean_squared_error: 0.11896/6 [======
Epoch 63/150
1/6 [====>........................] - ETA: 0s - loss: 0.1117 - mean_squared_error: 0.11176/6 [======
Epoch 64/150
1/6 [====>........................] - ETA: 0s - loss: 0.0755 - mean_squared_error: 0.07556/6 [======
Epoch 65/150
1/6 [====>........................] - ETA: 0s - loss: 0.1546 - mean_squared_error: 0.15466/6 [======
Epoch 66/150
1/6 [====>........................] - ETA: 0s - loss: 0.0794 - mean_squared_error: 0.07946/6 [======
Epoch 67/150
1/6 [====>........................] - ETA: 0s - loss: 0.0982 - mean_squared_error: 0.09826/6 [======
Epoch 68/150
1/6 [====>........................] - ETA: 0s - loss: 0.1122 - mean_squared_error: 0.11226/6 [======
Epoch 69/150
1/6 [====>........................] - ETA: 0s - loss: 0.1083 - mean_squared_error: 0.10836/6 [======
Epoch 70/150
1/6 [====>........................] - ETA: 0s - loss: 0.1187 - mean_squared_error: 0.11876/6 [======
Epoch 71/150
1/6 [====>........................] - ETA: 0s - loss: 0.1071 - mean_squared_error: 0.10716/6 [======
Epoch 72/150
1/6 [====>........................] - ETA: 0s - loss: 0.1035 - mean_squared_error: 0.10356/6 [======
Epoch 73/150
1/6 [====>........................] - ETA: 0s - loss: 0.0851 - mean_squared_error: 0.08516/6 [======
Epoch 74/150
1/6 [====>........................] - ETA: 0s - loss: 0.1388 - mean_squared_error: 0.13886/6 [======
Epoch 75/150
1/6 [====>........................] - ETA: 0s - loss: 0.0867 - mean_squared_error: 0.08676/6 [======
Epoch 76/150
1/6 [====>........................] - ETA: 0s - loss: 0.0444 - mean_squared_error: 0.04446/6 [======
Epoch 77/150
1/6 [====>........................] - ETA: 0s - loss: 0.0664 - mean_squared_error: 0.06646/6 [======
Epoch 78/150
1/6 [====>........................] - ETA: 0s - loss: 0.1173 - mean_squared_error: 0.11736/6 [======
Epoch 79/150
1/6 [====>........................] - ETA: 0s - loss: 0.1472 - mean_squared_error: 0.14726/6 [======
Epoch 80/150
1/6 [====>........................] - ETA: 0s - loss: 0.1207 - mean_squared_error: 0.12076/6 [======
Epoch 81/150
1/6 [====>........................] - ETA: 0s - loss: 0.1147 - mean_squared_error: 0.11476/6 [======
Epoch 82/150
1/6 [====>........................] - ETA: 0s - loss: 0.1201 - mean_squared_error: 0.12016/6 [======
Epoch 83/150
1/6 [====>........................] - ETA: 0s - loss: 0.0872 - mean_squared_error: 0.08726/6 [======
Epoch 84/150
1/6 [====>........................] - ETA: 0s - loss: 0.0576 - mean_squared_error: 0.05766/6 [======
Epoch 85/150
1/6 [====>........................] - ETA: 0s - loss: 0.0721 - mean_squared_error: 0.07216/6 [======
Epoch 86/150
1/6 [====>........................] - ETA: 0s - loss: 0.1268 - mean_squared_error: 0.12686/6 [======
Epoch 87/150
1/6 [====>........................] - ETA: 0s - loss: 0.1100 - mean_squared_error: 0.11006/6 [======
Epoch 88/150
1/6 [====>........................] - ETA: 0s - loss: 0.0940 - mean_squared_error: 0.09406/6 [======
```

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Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0628 - mean_squared_error: 0.06286/6 [======
Epoch 90/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1130 - mean_squared_error: 0.11306/6 [======
Epoch 91/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0879 - mean_squared_error: 0.08796/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0855 - mean_squared_error: 0.08556/6 [======
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1225 - mean_squared_error: 0.12256/6 [======
Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0858 - mean_squared_error: 0.08586/6 [======
Epoch 95/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0662 - mean_squared_error: 0.06626/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1451 - mean_squared_error: 0.14516/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0692 - mean_squared_error: 0.06926/6 [======
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0476 - mean_squared_error: 0.04766/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1408 - mean_squared_error: 0.14086/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0465 - mean_squared_error: 0.04656/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0503 - mean_squared_error: 0.05036/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1147 - mean_squared_error: 0.11476/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0859 - mean_squared_error: 0.08596/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1065 - mean_squared_error: 0.10656/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0575 - mean_squared_error: 0.05756/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0844 - mean_squared_error: 0.08446/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0709 - mean_squared_error: 0.07096/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1278 - mean_squared_error: 0.12786/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0725 - mean_squared_error: 0.07256/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0381 - mean_squared_error: 0.03816/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0611 - mean_squared_error: 0.06116/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0311 - mean_squared_error: 0.03116/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0786 - mean_squared_error: 0.07866/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0592 - mean_squared_error: 0.05926/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0579 - mean_squared_error: 0.05796/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0652 - mean_squared_error: 0.06526/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0743 - mean_squared_error: 0.07436/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0435 - mean_squared_error: 0.04356/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0733 - mean_squared_error: 0.07336/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0699 - mean_squared_error: 0.06996/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1159 - mean_squared_error: 0.11596/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0460 - mean_squared_error: 0.04606/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0891 - mean_squared_error: 0.08916/6 [======
Epoch 124/150
```

```
1/6 [===>........................] - ETA: 0s - loss: 0.1024 - mean_squared_error: 0.10246/6 [======
Epoch 125/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0799 - mean_squared_error: 0.07996/6 [======
Epoch 126/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0866 - mean_squared_error: 0.08666/6 [======
Epoch 127/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0750 - mean_squared_error: 0.07506/6 [======
Epoch 128/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0525 - mean_squared_error: 0.05256/6 [======
Epoch 129/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0459 - mean_squared_error: 0.04596/6 [======
Epoch 130/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0402 - mean_squared_error: 0.04026/6 [======
Epoch 131/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0611 - mean_squared_error: 0.06116/6 [======
Epoch 132/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0450 - mean_squared_error: 0.04506/6 [======
Epoch 133/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0556 - mean_squared_error: 0.05566/6 [======
Epoch 134/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0386 - mean_squared_error: 0.03866/6 [======
Epoch 135/150
1/6 [====>.......................] - ETA: 0s - loss: 0.1258 - mean_squared_error: 0.12586/6 [======
Epoch 136/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0348 - mean_squared_error: 0.03486/6 [======
Epoch 137/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0986 - mean_squared_error: 0.09866/6 [======
Epoch 138/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0917 - mean_squared_error: 0.09176/6 [======
Epoch 139/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0463 - mean_squared_error: 0.04636/6 [======
Epoch 140/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0715 - mean_squared_error: 0.07156/6 [======
Epoch 141/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0626 - mean_squared_error: 0.06266/6 [======
Epoch 142/150
1/6 [====>.......................] - ETA: 0s - loss: 0.1138 - mean_squared_error: 0.11386/6 [======
Epoch 143/150
1/6 [====>.......................] - ETA: 0s - loss: 0.1110 - mean_squared_error: 0.11106/6 [======
Epoch 144/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0756 - mean_squared_error: 0.07566/6 [======
Epoch 145/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0550 - mean_squared_error: 0.05506/6 [======
Epoch 146/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0236 - mean_squared_error: 0.02366/6 [======
Epoch 147/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0604 - mean_squared_error: 0.06046/6 [======
Epoch 148/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0786 - mean_squared_error: 0.07866/6 [======
Epoch 149/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0686 - mean_squared_error: 0.06866/6 [======
Epoch 150/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0977 - mean_squared_error: 0.09776/6 [======
```

```
MSE on Train Set for Training Model # 37  =  0.0890897951483019

MSE on Test Set for Training Model # 37  =  0.12120844311157097

             precision    recall  f1-score   support

          0       0.75      0.84      0.79        25
          1       0.88      0.81      0.84        36

   accuracy                           0.82        61
  macro avg       0.81      0.82      0.82        61
weighted avg       0.83      0.82      0.82        61
```

```
Training Model #  38


Epoch 1/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2714 - mean_squared_error: 0.27146/6 [======
Epoch 2/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2703 - mean_squared_error: 0.27036/6 [======
Epoch 3/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2465 - mean_squared_error: 0.24656/6 [======
Epoch 4/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2710 - mean_squared_error: 0.27106/6 [======
Epoch 5/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2420 - mean_squared_error: 0.24206/6 [======
Epoch 6/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2485 - mean_squared_error: 0.24856/6 [======
Epoch 7/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2505 - mean_squared_error: 0.25056/6 [======
Epoch 8/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2444 - mean_squared_error: 0.24446/6 [======
Epoch 9/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2197 - mean_squared_error: 0.21976/6 [======
Epoch 10/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2422 - mean_squared_error: 0.24226/6 [======
Epoch 11/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2431 - mean_squared_error: 0.24316/6 [======
Epoch 12/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2171 - mean_squared_error: 0.21716/6 [======
Epoch 13/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2090 - mean_squared_error: 0.20906/6 [======
Epoch 14/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2079 - mean_squared_error: 0.20796/6 [======
Epoch 15/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2066 - mean_squared_error: 0.20666/6 [======
Epoch 16/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1802 - mean_squared_error: 0.18026/6 [======
Epoch 17/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2069 - mean_squared_error: 0.20696/6 [======
Epoch 18/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1973 - mean_squared_error: 0.19736/6 [======
Epoch 19/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1877 - mean_squared_error: 0.18776/6 [======
Epoch 20/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1868 - mean_squared_error: 0.18686/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2001 - mean_squared_error: 0.20016/6 [======
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1733 - mean_squared_error: 0.17336/6 [======
Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1529 - mean_squared_error: 0.15296/6 [======
Epoch 24/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1583 - mean_squared_error: 0.15836/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1504 - mean_squared_error: 0.15046/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2027 - mean_squared_error: 0.20276/6 [======
Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1635 - mean_squared_error: 0.16356/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1464 - mean_squared_error: 0.14646/6 [======
Epoch 29/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1414 - mean_squared_error: 0.14146/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1349 - mean_squared_error: 0.13496/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1237 - mean_squared_error: 0.12376/6 [======
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1474 - mean_squared_error: 0.14746/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1204 - mean_squared_error: 0.12046/6 [======
Epoch 34/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.0875 - mean_squared_error: 0.08756/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1291 - mean_squared_error: 0.12916/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1098 - mean_squared_error: 0.10986/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1265 - mean_squared_error: 0.12656/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1354 - mean_squared_error: 0.13546/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1293 - mean_squared_error: 0.12936/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1513 - mean_squared_error: 0.15136/6 [======
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1262 - mean_squared_error: 0.12626/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1016 - mean_squared_error: 0.10166/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0947 - mean_squared_error: 0.09476/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1078 - mean_squared_error: 0.10786/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1060 - mean_squared_error: 0.10606/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1106 - mean_squared_error: 0.11066/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1188 - mean_squared_error: 0.11886/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0936 - mean_squared_error: 0.09366/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1285 - mean_squared_error: 0.12856/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0958 - mean_squared_error: 0.09586/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1216 - mean_squared_error: 0.12166/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0806 - mean_squared_error: 0.08066/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1210 - mean_squared_error: 0.12106/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1000 - mean_squared_error: 0.10006/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1297 - mean_squared_error: 0.12976/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0741 - mean_squared_error: 0.07416/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1161 - mean_squared_error: 0.11616/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0998 - mean_squared_error: 0.09986/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1186 - mean_squared_error: 0.11866/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1222 - mean_squared_error: 0.12226/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1941 - mean_squared_error: 0.19416/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0986 - mean_squared_error: 0.09866/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0721 - mean_squared_error: 0.07216/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1093 - mean_squared_error: 0.10936/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1498 - mean_squared_error: 0.14986/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1049 - mean_squared_error: 0.10496/6 [======
Epoch 67/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1394 - mean_squared_error: 0.13946/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1116 - mean_squared_error: 0.11166/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0836 - mean_squared_error: 0.08366/6 [======
```

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Epoch 70/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0900 - mean_squared_error: 0.09006/6 [======
Epoch 71/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0681 - mean_squared_error: 0.06816/6 [======
Epoch 72/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0655 - mean_squared_error: 0.06556/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1635 - mean_squared_error: 0.16356/6 [======
Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1152 - mean_squared_error: 0.11526/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0672 - mean_squared_error: 0.06726/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1655 - mean_squared_error: 0.16556/6 [======
Epoch 77/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0862 - mean_squared_error: 0.08626/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1086 - mean_squared_error: 0.10866/6 [======
Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0852 - mean_squared_error: 0.08526/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1046 - mean_squared_error: 0.10466/6 [======
Epoch 81/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0865 - mean_squared_error: 0.08656/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1030 - mean_squared_error: 0.10306/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1254 - mean_squared_error: 0.12546/6 [======
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0951 - mean_squared_error: 0.09516/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0699 - mean_squared_error: 0.06996/6 [======
Epoch 86/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0755 - mean_squared_error: 0.07556/6 [======
Epoch 87/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0882 - mean_squared_error: 0.08826/6 [======
Epoch 88/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0849 - mean_squared_error: 0.08496/6 [======
Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0794 - mean_squared_error: 0.07946/6 [======
Epoch 90/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0681 - mean_squared_error: 0.06816/6 [======
Epoch 91/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0542 - mean_squared_error: 0.05426/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0271 - mean_squared_error: 0.02716/6 [======
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1060 - mean_squared_error: 0.10606/6 [======
Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1079 - mean_squared_error: 0.10796/6 [======
Epoch 95/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1001 - mean_squared_error: 0.10016/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0670 - mean_squared_error: 0.06706/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0622 - mean_squared_error: 0.06226/6 [======
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0609 - mean_squared_error: 0.06096/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0367 - mean_squared_error: 0.03676/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0834 - mean_squared_error: 0.08346/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1585 - mean_squared_error: 0.15856/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1039 - mean_squared_error: 0.10396/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1134 - mean_squared_error: 0.11346/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0998 - mean_squared_error: 0.09986/6 [======
Epoch 105/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.0866 - mean_squared_error: 0.08666/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0549 - mean_squared_error: 0.05496/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0433 - mean_squared_error: 0.04336/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0428 - mean_squared_error: 0.04286/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0945 - mean_squared_error: 0.09456/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0576 - mean_squared_error: 0.05766/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0483 - mean_squared_error: 0.04836/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0693 - mean_squared_error: 0.06936/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0682 - mean_squared_error: 0.06826/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0583 - mean_squared_error: 0.05836/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0369 - mean_squared_error: 0.03696/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0660 - mean_squared_error: 0.06606/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0668 - mean_squared_error: 0.06686/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0838 - mean_squared_error: 0.08386/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0815 - mean_squared_error: 0.08156/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0861 - mean_squared_error: 0.08616/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0428 - mean_squared_error: 0.04286/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0376 - mean_squared_error: 0.03766/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1156 - mean_squared_error: 0.11566/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0476 - mean_squared_error: 0.04766/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0649 - mean_squared_error: 0.06496/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1076 - mean_squared_error: 0.10766/6 [======
Epoch 127/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1062 - mean_squared_error: 0.10626/6 [======
Epoch 128/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0304 - mean_squared_error: 0.03046/6 [======
Epoch 129/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0381 - mean_squared_error: 0.03816/6 [======
Epoch 130/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0985 - mean_squared_error: 0.09856/6 [======
Epoch 131/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0836 - mean_squared_error: 0.08366/6 [======
Epoch 132/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0303 - mean_squared_error: 0.03036/6 [======
Epoch 133/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0487 - mean_squared_error: 0.04876/6 [======
Epoch 134/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0251 - mean_squared_error: 0.02516/6 [======
Epoch 135/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0688 - mean_squared_error: 0.06886/6 [======
Epoch 136/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0398 - mean_squared_error: 0.03986/6 [======
Epoch 137/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1062 - mean_squared_error: 0.10626/6 [======
Epoch 138/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0539 - mean_squared_error: 0.05396/6 [======
Epoch 139/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0632 - mean_squared_error: 0.06326/6 [======
Epoch 140/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1052 - mean_squared_error: 0.10526/6 [======
```

```
Epoch 141/150
1/6 [====>........................] - ETA: 0s - loss: 0.0600 - mean_squared_error: 0.06006/6 [======
Epoch 142/150
1/6 [====>........................] - ETA: 0s - loss: 0.0527 - mean_squared_error: 0.05276/6 [======
Epoch 143/150
1/6 [====>........................] - ETA: 0s - loss: 0.0165 - mean_squared_error: 0.01656/6 [======
Epoch 144/150
1/6 [====>........................] - ETA: 0s - loss: 0.0944 - mean_squared_error: 0.09446/6 [======
Epoch 145/150
1/6 [====>........................] - ETA: 0s - loss: 0.0539 - mean_squared_error: 0.05396/6 [======
Epoch 146/150
1/6 [====>........................] - ETA: 0s - loss: 0.0658 - mean_squared_error: 0.06586/6 [======
Epoch 147/150
1/6 [====>........................] - ETA: 0s - loss: 0.0959 - mean_squared_error: 0.09596/6 [======
Epoch 148/150
1/6 [====>........................] - ETA: 0s - loss: 0.0834 - mean_squared_error: 0.08346/6 [======
Epoch 149/150
1/6 [====>........................] - ETA: 0s - loss: 0.0388 - mean_squared_error: 0.03886/6 [======
Epoch 150/150
1/6 [====>........................] - ETA: 0s - loss: 0.0429 - mean_squared_error: 0.04296/6 [======
```

```
MSE on Train Set for Training Model # 38  =  0.07990328383034995

MSE on Test Set for Training Model # 38  =  0.10339396116289638

              precision    recall  f1-score   support

           0       0.84      0.84      0.84        25
           1       0.89      0.89      0.89        36

    accuracy                           0.87        61
   macro avg       0.86      0.86      0.86        61
weighted avg       0.87      0.87      0.87        61
```

```
Training Model #  39
```

```
Epoch 1/150
1/6 [====>........................] - ETA: 0s - loss: 0.3020 - mean_squared_error: 0.30206/6 [======
Epoch 2/150
1/6 [====>........................] - ETA: 0s - loss: 0.3021 - mean_squared_error: 0.30216/6 [======
Epoch 3/150
1/6 [====>........................] - ETA: 0s - loss: 0.2655 - mean_squared_error: 0.26556/6 [======
Epoch 4/150
1/6 [====>........................] - ETA: 0s - loss: 0.2360 - mean_squared_error: 0.23606/6 [======
Epoch 5/150
1/6 [====>........................] - ETA: 0s - loss: 0.2816 - mean_squared_error: 0.28166/6 [======
Epoch 6/150
1/6 [====>........................] - ETA: 0s - loss: 0.2702 - mean_squared_error: 0.27026/6 [======
Epoch 7/150
1/6 [====>........................] - ETA: 0s - loss: 0.2127 - mean_squared_error: 0.21276/6 [======
Epoch 8/150
1/6 [====>........................] - ETA: 0s - loss: 0.2591 - mean_squared_error: 0.25916/6 [======
Epoch 9/150
1/6 [====>........................] - ETA: 0s - loss: 0.2109 - mean_squared_error: 0.21096/6 [======
Epoch 10/150
1/6 [====>........................] - ETA: 0s - loss: 0.2611 - mean_squared_error: 0.26116/6 [======
Epoch 11/150
1/6 [====>........................] - ETA: 0s - loss: 0.1633 - mean_squared_error: 0.16336/6 [======
Epoch 12/150
1/6 [====>........................] - ETA: 0s - loss: 0.1746 - mean_squared_error: 0.17466/6 [======
Epoch 13/150
1/6 [====>........................] - ETA: 0s - loss: 0.2171 - mean_squared_error: 0.21716/6 [======
Epoch 14/150
1/6 [====>........................] - ETA: 0s - loss: 0.2162 - mean_squared_error: 0.21626/6 [======
Epoch 15/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.2017 - mean_squared_error: 0.20176/6 [======
Epoch 16/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2159 - mean_squared_error: 0.21596/6 [======
Epoch 17/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1557 - mean_squared_error: 0.15576/6 [======
Epoch 18/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1755 - mean_squared_error: 0.17556/6 [======
Epoch 19/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1940 - mean_squared_error: 0.19406/6 [======
Epoch 20/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2096 - mean_squared_error: 0.20966/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2191 - mean_squared_error: 0.21916/6 [======
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1487 - mean_squared_error: 0.14876/6 [======
Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1731 - mean_squared_error: 0.17316/6 [======
Epoch 24/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1571 - mean_squared_error: 0.15716/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1670 - mean_squared_error: 0.16706/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2264 - mean_squared_error: 0.22646/6 [======
Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1499 - mean_squared_error: 0.14996/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1641 - mean_squared_error: 0.16416/6 [======
Epoch 29/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1220 - mean_squared_error: 0.12206/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1407 - mean_squared_error: 0.14076/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1385 - mean_squared_error: 0.13856/6 [======
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1468 - mean_squared_error: 0.14686/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1844 - mean_squared_error: 0.18446/6 [======
Epoch 34/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1741 - mean_squared_error: 0.17416/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1361 - mean_squared_error: 0.13616/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1427 - mean_squared_error: 0.14276/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1051 - mean_squared_error: 0.10516/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1583 - mean_squared_error: 0.15836/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1785 - mean_squared_error: 0.17856/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1630 - mean_squared_error: 0.16306/6 [======
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0956 - mean_squared_error: 0.09566/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1365 - mean_squared_error: 0.13656/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1325 - mean_squared_error: 0.13256/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1461 - mean_squared_error: 0.14616/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0966 - mean_squared_error: 0.09666/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1372 - mean_squared_error: 0.13726/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1151 - mean_squared_error: 0.11516/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1099 - mean_squared_error: 0.10996/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1291 - mean_squared_error: 0.12916/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0631 - mean_squared_error: 0.06316/6 [======
```

```
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1537 - mean_squared_error: 0.15376/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1236 - mean_squared_error: 0.12366/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1025 - mean_squared_error: 0.10256/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0822 - mean_squared_error: 0.08226/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1101 - mean_squared_error: 0.11016/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1155 - mean_squared_error: 0.11556/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1076 - mean_squared_error: 0.10766/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1035 - mean_squared_error: 0.10356/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1206 - mean_squared_error: 0.12066/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0917 - mean_squared_error: 0.09176/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0835 - mean_squared_error: 0.08356/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1226 - mean_squared_error: 0.12266/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1388 - mean_squared_error: 0.13886/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1182 - mean_squared_error: 0.11826/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0983 - mean_squared_error: 0.09836/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0868 - mean_squared_error: 0.08686/6 [======
Epoch 67/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0678 - mean_squared_error: 0.06786/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1067 - mean_squared_error: 0.10676/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0735 - mean_squared_error: 0.07356/6 [======
Epoch 70/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1089 - mean_squared_error: 0.10896/6 [======
Epoch 71/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0869 - mean_squared_error: 0.08696/6 [======
Epoch 72/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0848 - mean_squared_error: 0.08486/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1267 - mean_squared_error: 0.12676/6 [======
Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0976 - mean_squared_error: 0.09766/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0917 - mean_squared_error: 0.09176/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0995 - mean_squared_error: 0.09956/6 [======
Epoch 77/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0487 - mean_squared_error: 0.04876/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0993 - mean_squared_error: 0.09936/6 [======
Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0929 - mean_squared_error: 0.09296/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0753 - mean_squared_error: 0.07536/6 [======
Epoch 81/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0840 - mean_squared_error: 0.08406/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0986 - mean_squared_error: 0.09866/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0910 - mean_squared_error: 0.09106/6 [======
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0855 - mean_squared_error: 0.08556/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1274 - mean_squared_error: 0.12746/6 [======
Epoch 86/150
```

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1/6 [====>........................] - ETA: 0s - loss: 0.0974 - mean_squared_error: 0.09746/6 [======
Epoch 87/150
1/6 [====>........................] - ETA: 0s - loss: 0.1016 - mean_squared_error: 0.10166/6 [======
Epoch 88/150
1/6 [====>........................] - ETA: 0s - loss: 0.1034 - mean_squared_error: 0.10346/6 [======
Epoch 89/150
1/6 [====>........................] - ETA: 0s - loss: 0.1055 - mean_squared_error: 0.10556/6 [======
Epoch 90/150
1/6 [====>........................] - ETA: 0s - loss: 0.1045 - mean_squared_error: 0.10456/6 [======
Epoch 91/150
1/6 [====>........................] - ETA: 0s - loss: 0.0626 - mean_squared_error: 0.06266/6 [======
Epoch 92/150
1/6 [====>........................] - ETA: 0s - loss: 0.1387 - mean_squared_error: 0.13876/6 [======
Epoch 93/150
1/6 [====>........................] - ETA: 0s - loss: 0.1172 - mean_squared_error: 0.11726/6 [======
Epoch 94/150
1/6 [====>........................] - ETA: 0s - loss: 0.0720 - mean_squared_error: 0.07206/6 [======
Epoch 95/150
1/6 [====>........................] - ETA: 0s - loss: 0.0493 - mean_squared_error: 0.04936/6 [======
Epoch 96/150
1/6 [====>........................] - ETA: 0s - loss: 0.1330 - mean_squared_error: 0.13306/6 [======
Epoch 97/150
1/6 [====>........................] - ETA: 0s - loss: 0.0730 - mean_squared_error: 0.07306/6 [======
Epoch 98/150
1/6 [====>........................] - ETA: 0s - loss: 0.1269 - mean_squared_error: 0.12696/6 [======
Epoch 99/150
1/6 [====>........................] - ETA: 0s - loss: 0.0520 - mean_squared_error: 0.05206/6 [======
Epoch 100/150
1/6 [====>........................] - ETA: 0s - loss: 0.0781 - mean_squared_error: 0.07816/6 [======
Epoch 101/150
1/6 [====>........................] - ETA: 0s - loss: 0.0565 - mean_squared_error: 0.05656/6 [======
Epoch 102/150
1/6 [====>........................] - ETA: 0s - loss: 0.1092 - mean_squared_error: 0.10926/6 [======
Epoch 103/150
1/6 [====>........................] - ETA: 0s - loss: 0.0555 - mean_squared_error: 0.05556/6 [======
Epoch 104/150
1/6 [====>........................] - ETA: 0s - loss: 0.1054 - mean_squared_error: 0.10546/6 [======
Epoch 105/150
1/6 [====>........................] - ETA: 0s - loss: 0.0660 - mean_squared_error: 0.06606/6 [======
Epoch 106/150
1/6 [====>........................] - ETA: 0s - loss: 0.0968 - mean_squared_error: 0.09686/6 [======
Epoch 107/150
1/6 [====>........................] - ETA: 0s - loss: 0.0922 - mean_squared_error: 0.09226/6 [======
Epoch 108/150
1/6 [====>........................] - ETA: 0s - loss: 0.0664 - mean_squared_error: 0.06646/6 [======
Epoch 109/150
1/6 [====>........................] - ETA: 0s - loss: 0.0712 - mean_squared_error: 0.07126/6 [======
Epoch 110/150
1/6 [====>........................] - ETA: 0s - loss: 0.1243 - mean_squared_error: 0.12436/6 [======
Epoch 111/150
1/6 [====>........................] - ETA: 0s - loss: 0.0463 - mean_squared_error: 0.04636/6 [======
Epoch 112/150
1/6 [====>........................] - ETA: 0s - loss: 0.0411 - mean_squared_error: 0.04116/6 [======
Epoch 113/150
1/6 [====>........................] - ETA: 0s - loss: 0.1187 - mean_squared_error: 0.11876/6 [======
Epoch 114/150
1/6 [====>........................] - ETA: 0s - loss: 0.0627 - mean_squared_error: 0.06276/6 [======
Epoch 115/150
1/6 [====>........................] - ETA: 0s - loss: 0.0412 - mean_squared_error: 0.04126/6 [======
Epoch 116/150
1/6 [====>........................] - ETA: 0s - loss: 0.0547 - mean_squared_error: 0.05476/6 [======
Epoch 117/150
1/6 [====>........................] - ETA: 0s - loss: 0.1092 - mean_squared_error: 0.10926/6 [======
Epoch 118/150
1/6 [====>........................] - ETA: 0s - loss: 0.1213 - mean_squared_error: 0.12136/6 [======
Epoch 119/150
1/6 [====>........................] - ETA: 0s - loss: 0.0730 - mean_squared_error: 0.07306/6 [======
Epoch 120/150
1/6 [====>........................] - ETA: 0s - loss: 0.0990 - mean_squared_error: 0.09906/6 [======
Epoch 121/150
1/6 [====>........................] - ETA: 0s - loss: 0.1024 - mean_squared_error: 0.10246/6 [======
```

```
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0770 - mean_squared_error: 0.07706/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0856 - mean_squared_error: 0.08566/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0667 - mean_squared_error: 0.06676/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0307 - mean_squared_error: 0.03076/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0975 - mean_squared_error: 0.09756/6 [======
Epoch 127/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0481 - mean_squared_error: 0.04816/6 [======
Epoch 128/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0706 - mean_squared_error: 0.07066/6 [======
Epoch 129/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0608 - mean_squared_error: 0.06086/6 [======
Epoch 130/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0743 - mean_squared_error: 0.07436/6 [======
Epoch 131/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0794 - mean_squared_error: 0.07946/6 [======
Epoch 132/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0486 - mean_squared_error: 0.04866/6 [======
Epoch 133/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0585 - mean_squared_error: 0.05856/6 [======
Epoch 134/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1463 - mean_squared_error: 0.14636/6 [======
Epoch 135/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0882 - mean_squared_error: 0.08826/6 [======
Epoch 136/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0804 - mean_squared_error: 0.08046/6 [======
Epoch 137/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0718 - mean_squared_error: 0.07186/6 [======
Epoch 138/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0577 - mean_squared_error: 0.05776/6 [======
Epoch 139/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0524 - mean_squared_error: 0.05246/6 [======
Epoch 140/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0444 - mean_squared_error: 0.04446/6 [======
Epoch 141/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0526 - mean_squared_error: 0.05266/6 [======
Epoch 142/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0246 - mean_squared_error: 0.02466/6 [======
Epoch 143/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0731 - mean_squared_error: 0.07316/6 [======
Epoch 144/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0350 - mean_squared_error: 0.03506/6 [======
Epoch 145/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0804 - mean_squared_error: 0.08046/6 [======
Epoch 146/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0565 - mean_squared_error: 0.05656/6 [======
Epoch 147/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0966 - mean_squared_error: 0.09666/6 [======
Epoch 148/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0528 - mean_squared_error: 0.05286/6 [======
Epoch 149/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0655 - mean_squared_error: 0.06556/6 [======
Epoch 150/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0346 - mean_squared_error: 0.03466/6 [======
```

```
MSE on Train Set for Training Model # 39  =  0.09108624343116753

MSE on Test Set for Training Model # 39  =  0.1025771119725054

              precision    recall  f1-score   support

           0       0.83      0.80      0.82        25
           1       0.86      0.89      0.88        36

    accuracy                           0.85        61
```

```
   macro avg       0.85      0.84      0.85        61
weighted avg       0.85      0.85      0.85        61




Training Model #  40


Epoch 1/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2547 - mean_squared_error: 0.25476/6 [======
Epoch 2/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2274 - mean_squared_error: 0.22746/6 [======
Epoch 3/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2397 - mean_squared_error: 0.23976/6 [======
Epoch 4/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2622 - mean_squared_error: 0.26226/6 [======
Epoch 5/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2122 - mean_squared_error: 0.21226/6 [======
Epoch 6/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2544 - mean_squared_error: 0.25446/6 [======
Epoch 7/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2180 - mean_squared_error: 0.21806/6 [======
Epoch 8/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2387 - mean_squared_error: 0.23876/6 [======
Epoch 9/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2026 - mean_squared_error: 0.20266/6 [======
Epoch 10/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1822 - mean_squared_error: 0.18226/6 [======
Epoch 11/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1997 - mean_squared_error: 0.19976/6 [======
Epoch 12/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1822 - mean_squared_error: 0.18226/6 [======
Epoch 13/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1709 - mean_squared_error: 0.17096/6 [======
Epoch 14/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1819 - mean_squared_error: 0.18196/6 [======
Epoch 15/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1819 - mean_squared_error: 0.18196/6 [======
Epoch 16/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1673 - mean_squared_error: 0.16736/6 [======
Epoch 17/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1846 - mean_squared_error: 0.18466/6 [======
Epoch 18/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1502 - mean_squared_error: 0.15026/6 [======
Epoch 19/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1285 - mean_squared_error: 0.12856/6 [======
Epoch 20/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1626 - mean_squared_error: 0.16266/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1282 - mean_squared_error: 0.12826/6 [======
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1465 - mean_squared_error: 0.14656/6 [======
Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1849 - mean_squared_error: 0.18496/6 [======
Epoch 24/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1402 - mean_squared_error: 0.14026/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1436 - mean_squared_error: 0.14366/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2154 - mean_squared_error: 0.21546/6 [======
Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1325 - mean_squared_error: 0.13256/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1446 - mean_squared_error: 0.14466/6 [======
Epoch 29/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1545 - mean_squared_error: 0.15456/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1390 - mean_squared_error: 0.13906/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1555 - mean_squared_error: 0.15556/6 [======
```

```
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1194 - mean_squared_error: 0.11946/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1780 - mean_squared_error: 0.17806/6 [======
Epoch 34/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0751 - mean_squared_error: 0.07516/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1145 - mean_squared_error: 0.11456/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1334 - mean_squared_error: 0.13346/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1006 - mean_squared_error: 0.10066/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1043 - mean_squared_error: 0.10436/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1218 - mean_squared_error: 0.12186/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1245 - mean_squared_error: 0.12456/6 [======
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1202 - mean_squared_error: 0.12026/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1023 - mean_squared_error: 0.10236/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1370 - mean_squared_error: 0.13706/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1262 - mean_squared_error: 0.12626/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1207 - mean_squared_error: 0.12076/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1432 - mean_squared_error: 0.14326/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1396 - mean_squared_error: 0.13966/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1069 - mean_squared_error: 0.10696/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1517 - mean_squared_error: 0.15176/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1445 - mean_squared_error: 0.14456/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1635 - mean_squared_error: 0.16356/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1256 - mean_squared_error: 0.12566/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1181 - mean_squared_error: 0.11816/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1028 - mean_squared_error: 0.10286/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1003 - mean_squared_error: 0.10036/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1318 - mean_squared_error: 0.13186/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1299 - mean_squared_error: 0.12996/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1514 - mean_squared_error: 0.15146/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0989 - mean_squared_error: 0.09896/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1383 - mean_squared_error: 0.13836/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1211 - mean_squared_error: 0.12116/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1565 - mean_squared_error: 0.15656/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1408 - mean_squared_error: 0.14086/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0837 - mean_squared_error: 0.08376/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0878 - mean_squared_error: 0.08786/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0633 - mean_squared_error: 0.06336/6 [======
Epoch 67/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.0872 - mean_squared_error: 0.08726/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1091 - mean_squared_error: 0.10916/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0966 - mean_squared_error: 0.09666/6 [======
Epoch 70/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1096 - mean_squared_error: 0.10966/6 [======
Epoch 71/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1371 - mean_squared_error: 0.13716/6 [======
Epoch 72/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0808 - mean_squared_error: 0.08086/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1357 - mean_squared_error: 0.13576/6 [======
Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0708 - mean_squared_error: 0.07086/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0718 - mean_squared_error: 0.07186/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0656 - mean_squared_error: 0.06566/6 [======
Epoch 77/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1310 - mean_squared_error: 0.13106/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1044 - mean_squared_error: 0.10446/6 [======
Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0938 - mean_squared_error: 0.09386/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0456 - mean_squared_error: 0.04566/6 [======
Epoch 81/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0843 - mean_squared_error: 0.08436/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0912 - mean_squared_error: 0.09126/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1002 - mean_squared_error: 0.10026/6 [======
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1101 - mean_squared_error: 0.11016/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0492 - mean_squared_error: 0.04926/6 [======
Epoch 86/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0860 - mean_squared_error: 0.08606/6 [======
Epoch 87/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0780 - mean_squared_error: 0.07806/6 [======
Epoch 88/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1044 - mean_squared_error: 0.10446/6 [======
Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0817 - mean_squared_error: 0.08176/6 [======
Epoch 90/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0630 - mean_squared_error: 0.06306/6 [======
Epoch 91/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0350 - mean_squared_error: 0.03506/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0865 - mean_squared_error: 0.08656/6 [======
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0907 - mean_squared_error: 0.09076/6 [======
Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1072 - mean_squared_error: 0.10726/6 [======
Epoch 95/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0897 - mean_squared_error: 0.08976/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0901 - mean_squared_error: 0.09016/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0863 - mean_squared_error: 0.08636/6 [======
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0553 - mean_squared_error: 0.05536/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0729 - mean_squared_error: 0.07296/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1267 - mean_squared_error: 0.12676/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1138 - mean_squared_error: 0.11386/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0398 - mean_squared_error: 0.03986/6 [======
```

```
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0585 - mean_squared_error: 0.05856/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1573 - mean_squared_error: 0.15736/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0700 - mean_squared_error: 0.07006/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0432 - mean_squared_error: 0.04326/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0543 - mean_squared_error: 0.05436/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0490 - mean_squared_error: 0.04906/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0532 - mean_squared_error: 0.05326/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0808 - mean_squared_error: 0.08086/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0735 - mean_squared_error: 0.07356/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0380 - mean_squared_error: 0.03806/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0965 - mean_squared_error: 0.09656/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0722 - mean_squared_error: 0.07226/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0806 - mean_squared_error: 0.08066/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1062 - mean_squared_error: 0.10626/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0898 - mean_squared_error: 0.08986/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0520 - mean_squared_error: 0.05206/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0491 - mean_squared_error: 0.04916/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0795 - mean_squared_error: 0.07956/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0999 - mean_squared_error: 0.09996/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1071 - mean_squared_error: 0.10716/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0980 - mean_squared_error: 0.09806/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0841 - mean_squared_error: 0.08416/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0760 - mean_squared_error: 0.07606/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0373 - mean_squared_error: 0.03736/6 [======
Epoch 127/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0643 - mean_squared_error: 0.06436/6 [======
Epoch 128/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0929 - mean_squared_error: 0.09296/6 [======
Epoch 129/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0701 - mean_squared_error: 0.07016/6 [======
Epoch 130/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0485 - mean_squared_error: 0.04856/6 [======
Epoch 131/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0780 - mean_squared_error: 0.07806/6 [======
Epoch 132/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0884 - mean_squared_error: 0.08846/6 [======
Epoch 133/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0420 - mean_squared_error: 0.04206/6 [======
Epoch 134/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0715 - mean_squared_error: 0.07156/6 [======
Epoch 135/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0883 - mean_squared_error: 0.08836/6 [======
Epoch 136/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0456 - mean_squared_error: 0.04566/6 [======
Epoch 137/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0694 - mean_squared_error: 0.06946/6 [======
Epoch 138/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.0464 - mean_squared_error: 0.04646/6 [======
Epoch 139/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0618 - mean_squared_error: 0.06186/6 [======
Epoch 140/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0909 - mean_squared_error: 0.09096/6 [======
Epoch 141/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0423 - mean_squared_error: 0.04236/6 [======
Epoch 142/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0609 - mean_squared_error: 0.06096/6 [======
Epoch 143/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0596 - mean_squared_error: 0.05966/6 [======
Epoch 144/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1270 - mean_squared_error: 0.12706/6 [======
Epoch 145/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1056 - mean_squared_error: 0.10566/6 [======
Epoch 146/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0854 - mean_squared_error: 0.08546/6 [======
Epoch 147/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1543 - mean_squared_error: 0.15436/6 [======
Epoch 148/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0252 - mean_squared_error: 0.02526/6 [======
Epoch 149/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0782 - mean_squared_error: 0.07826/6 [======
Epoch 150/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0783 - mean_squared_error: 0.07836/6 [======
```

MSE on Train Set for Training Model # 40 = 0.08973389032720433

MSE on Test Set for Training Model # 40 = 0.07796798907373871

```
              precision    recall  f1-score   support

           0       0.85      0.92      0.88        25
           1       0.94      0.89      0.91        36

    accuracy                           0.90        61
   macro avg       0.90      0.90      0.90        61
weighted avg       0.90      0.90      0.90        61
```

Training Model # 41

```
Epoch 1/150
1/6 [====>.........................] - ETA: 0s - loss: 0.3048 - mean_squared_error: 0.30486/6 [======
Epoch 2/150
1/6 [====>.........................] - ETA: 0s - loss: 0.3717 - mean_squared_error: 0.37176/6 [======
Epoch 3/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2934 - mean_squared_error: 0.29346/6 [======
Epoch 4/150
1/6 [====>.........................] - ETA: 0s - loss: 0.3234 - mean_squared_error: 0.32346/6 [======
Epoch 5/150
1/6 [====>.........................] - ETA: 0s - loss: 0.3182 - mean_squared_error: 0.31826/6 [======
Epoch 6/150
1/6 [====>.........................] - ETA: 0s - loss: 0.3112 - mean_squared_error: 0.31126/6 [======
Epoch 7/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2538 - mean_squared_error: 0.25386/6 [======
Epoch 8/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2798 - mean_squared_error: 0.27986/6 [======
Epoch 9/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2395 - mean_squared_error: 0.23956/6 [======
Epoch 10/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2351 - mean_squared_error: 0.23516/6 [======
Epoch 11/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2522 - mean_squared_error: 0.25226/6 [======
Epoch 12/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2122 - mean_squared_error: 0.21226/6 [======
```

```
Epoch 13/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2278 - mean_squared_error: 0.22786/6 [======
Epoch 14/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2153 - mean_squared_error: 0.21536/6 [======
Epoch 15/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2172 - mean_squared_error: 0.21726/6 [======
Epoch 16/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2198 - mean_squared_error: 0.21986/6 [======
Epoch 17/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2160 - mean_squared_error: 0.21606/6 [======
Epoch 18/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1918 - mean_squared_error: 0.19186/6 [======
Epoch 19/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2014 - mean_squared_error: 0.20146/6 [======
Epoch 20/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1898 - mean_squared_error: 0.18986/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1762 - mean_squared_error: 0.17626/6 [======
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2032 - mean_squared_error: 0.20326/6 [======
Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1540 - mean_squared_error: 0.15406/6 [======
Epoch 24/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1396 - mean_squared_error: 0.13966/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2041 - mean_squared_error: 0.20416/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1792 - mean_squared_error: 0.17926/6 [======
Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1109 - mean_squared_error: 0.11096/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1850 - mean_squared_error: 0.18506/6 [======
Epoch 29/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1262 - mean_squared_error: 0.12626/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1617 - mean_squared_error: 0.16176/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1812 - mean_squared_error: 0.18126/6 [======
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1428 - mean_squared_error: 0.14286/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1963 - mean_squared_error: 0.19636/6 [======
Epoch 34/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1890 - mean_squared_error: 0.18906/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1189 - mean_squared_error: 0.11896/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1312 - mean_squared_error: 0.13126/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1283 - mean_squared_error: 0.12836/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1657 - mean_squared_error: 0.16576/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1358 - mean_squared_error: 0.13586/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1378 - mean_squared_error: 0.13786/6 [======
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1154 - mean_squared_error: 0.11546/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1203 - mean_squared_error: 0.12036/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1970 - mean_squared_error: 0.19706/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0908 - mean_squared_error: 0.09086/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0768 - mean_squared_error: 0.07686/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0987 - mean_squared_error: 0.09876/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1867 - mean_squared_error: 0.18676/6 [======
Epoch 48/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.1156 - mean_squared_error: 0.11566/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1493 - mean_squared_error: 0.14936/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1150 - mean_squared_error: 0.11506/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1414 - mean_squared_error: 0.14146/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1385 - mean_squared_error: 0.13856/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1348 - mean_squared_error: 0.13486/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1255 - mean_squared_error: 0.12556/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1155 - mean_squared_error: 0.11556/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1649 - mean_squared_error: 0.16496/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1698 - mean_squared_error: 0.16986/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0878 - mean_squared_error: 0.08786/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0870 - mean_squared_error: 0.08706/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0898 - mean_squared_error: 0.08986/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1211 - mean_squared_error: 0.12116/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1054 - mean_squared_error: 0.10546/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0979 - mean_squared_error: 0.09796/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1305 - mean_squared_error: 0.13056/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1355 - mean_squared_error: 0.13556/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1170 - mean_squared_error: 0.11706/6 [======
Epoch 67/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1407 - mean_squared_error: 0.14076/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1153 - mean_squared_error: 0.11536/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1248 - mean_squared_error: 0.12486/6 [======
Epoch 70/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1035 - mean_squared_error: 0.10356/6 [======
Epoch 71/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1140 - mean_squared_error: 0.11406/6 [======
Epoch 72/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0935 - mean_squared_error: 0.09356/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0721 - mean_squared_error: 0.07216/6 [======
Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1413 - mean_squared_error: 0.14136/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1083 - mean_squared_error: 0.10836/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0799 - mean_squared_error: 0.07996/6 [======
Epoch 77/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0421 - mean_squared_error: 0.04216/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0676 - mean_squared_error: 0.06766/6 [======
Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0846 - mean_squared_error: 0.08466/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1262 - mean_squared_error: 0.12626/6 [======
Epoch 81/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1240 - mean_squared_error: 0.12406/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1665 - mean_squared_error: 0.16656/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0726 - mean_squared_error: 0.07266/6 [======
```

```
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0924 - mean_squared_error: 0.09246/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0917 - mean_squared_error: 0.09176/6 [======
Epoch 86/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1465 - mean_squared_error: 0.14656/6 [======
Epoch 87/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0930 - mean_squared_error: 0.09306/6 [======
Epoch 88/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0865 - mean_squared_error: 0.08656/6 [======
Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0406 - mean_squared_error: 0.04066/6 [======
Epoch 90/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0575 - mean_squared_error: 0.05756/6 [======
Epoch 91/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1138 - mean_squared_error: 0.11386/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1400 - mean_squared_error: 0.14006/6 [======
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1525 - mean_squared_error: 0.15256/6 [======
Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0505 - mean_squared_error: 0.05056/6 [======
Epoch 95/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0796 - mean_squared_error: 0.07966/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1269 - mean_squared_error: 0.12696/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1124 - mean_squared_error: 0.11246/6 [======
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0591 - mean_squared_error: 0.05916/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0527 - mean_squared_error: 0.05276/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1003 - mean_squared_error: 0.10036/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1011 - mean_squared_error: 0.10116/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1268 - mean_squared_error: 0.12686/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0965 - mean_squared_error: 0.09656/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0502 - mean_squared_error: 0.05026/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0729 - mean_squared_error: 0.07296/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1770 - mean_squared_error: 0.17706/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0699 - mean_squared_error: 0.06996/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1177 - mean_squared_error: 0.11776/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0864 - mean_squared_error: 0.08646/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0990 - mean_squared_error: 0.09906/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0886 - mean_squared_error: 0.08866/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0791 - mean_squared_error: 0.07916/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0773 - mean_squared_error: 0.07736/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0569 - mean_squared_error: 0.05696/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1300 - mean_squared_error: 0.13006/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1397 - mean_squared_error: 0.13976/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0662 - mean_squared_error: 0.06626/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0778 - mean_squared_error: 0.07786/6 [======
Epoch 119/150
```

```
1/6 [====>........................] - ETA: 0s - loss: 0.0634 - mean_squared_error: 0.06346/6 [======
Epoch 120/150
1/6 [====>........................] - ETA: 0s - loss: 0.0741 - mean_squared_error: 0.07416/6 [======
Epoch 121/150
1/6 [====>........................] - ETA: 0s - loss: 0.1114 - mean_squared_error: 0.11146/6 [======
Epoch 122/150
1/6 [====>........................] - ETA: 0s - loss: 0.1227 - mean_squared_error: 0.12276/6 [======
Epoch 123/150
1/6 [====>........................] - ETA: 0s - loss: 0.1062 - mean_squared_error: 0.10626/6 [======
Epoch 124/150
1/6 [====>........................] - ETA: 0s - loss: 0.0744 - mean_squared_error: 0.07446/6 [======
Epoch 125/150
1/6 [====>........................] - ETA: 0s - loss: 0.0999 - mean_squared_error: 0.09996/6 [======
Epoch 126/150
1/6 [====>........................] - ETA: 0s - loss: 0.0885 - mean_squared_error: 0.08856/6 [======
Epoch 127/150
1/6 [====>........................] - ETA: 0s - loss: 0.1017 - mean_squared_error: 0.10176/6 [======
Epoch 128/150
1/6 [====>........................] - ETA: 0s - loss: 0.0878 - mean_squared_error: 0.08786/6 [======
Epoch 129/150
1/6 [====>........................] - ETA: 0s - loss: 0.0817 - mean_squared_error: 0.08176/6 [======
Epoch 130/150
1/6 [====>........................] - ETA: 0s - loss: 0.0870 - mean_squared_error: 0.08706/6 [======
Epoch 131/150
1/6 [====>........................] - ETA: 0s - loss: 0.0779 - mean_squared_error: 0.07796/6 [======
Epoch 132/150
1/6 [====>........................] - ETA: 0s - loss: 0.0735 - mean_squared_error: 0.07356/6 [======
Epoch 133/150
1/6 [====>........................] - ETA: 0s - loss: 0.0657 - mean_squared_error: 0.06576/6 [======
Epoch 134/150
1/6 [====>........................] - ETA: 0s - loss: 0.0939 - mean_squared_error: 0.09396/6 [======
Epoch 135/150
1/6 [====>........................] - ETA: 0s - loss: 0.0912 - mean_squared_error: 0.09126/6 [======
Epoch 136/150
1/6 [====>........................] - ETA: 0s - loss: 0.0357 - mean_squared_error: 0.03576/6 [======
Epoch 137/150
1/6 [====>........................] - ETA: 0s - loss: 0.1155 - mean_squared_error: 0.11556/6 [======
Epoch 138/150
1/6 [====>........................] - ETA: 0s - loss: 0.0685 - mean_squared_error: 0.06856/6 [======
Epoch 139/150
1/6 [====>........................] - ETA: 0s - loss: 0.0568 - mean_squared_error: 0.05686/6 [======
Epoch 140/150
1/6 [====>........................] - ETA: 0s - loss: 0.1088 - mean_squared_error: 0.10886/6 [======
Epoch 141/150
1/6 [====>........................] - ETA: 0s - loss: 0.0627 - mean_squared_error: 0.06276/6 [======
Epoch 142/150
1/6 [====>........................] - ETA: 0s - loss: 0.0734 - mean_squared_error: 0.07346/6 [======
Epoch 143/150
1/6 [====>........................] - ETA: 0s - loss: 0.0806 - mean_squared_error: 0.08066/6 [======
Epoch 144/150
1/6 [====>........................] - ETA: 0s - loss: 0.1215 - mean_squared_error: 0.12156/6 [======
Epoch 145/150
1/6 [====>........................] - ETA: 0s - loss: 0.0629 - mean_squared_error: 0.06296/6 [======
Epoch 146/150
1/6 [====>........................] - ETA: 0s - loss: 0.0331 - mean_squared_error: 0.03316/6 [======
Epoch 147/150
1/6 [====>........................] - ETA: 0s - loss: 0.1302 - mean_squared_error: 0.13026/6 [======
Epoch 148/150
1/6 [====>........................] - ETA: 0s - loss: 0.0654 - mean_squared_error: 0.06546/6 [======
Epoch 149/150
1/6 [====>........................] - ETA: 0s - loss: 0.0556 - mean_squared_error: 0.05566/6 [======
Epoch 150/150
1/6 [====>........................] - ETA: 0s - loss: 0.0767 - mean_squared_error: 0.07676/6 [======


MSE on Train Set for Training Model # 41  =  0.09360310323335617

MSE on Test Set for Training Model # 41  =  0.10199614405250229

              precision    recall  f1-score   support
```

```
        0        0.76        0.88        0.81          25
        1        0.91        0.81        0.85          36

  accuracy                                0.84          61
  macro avg      0.83        0.84        0.83          61
weighted avg     0.85        0.84        0.84          61
```

```
Training Model #  42


Epoch 1/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2396 - mean_squared_error: 0.23966/6 [======
Epoch 2/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2597 - mean_squared_error: 0.25976/6 [======
Epoch 3/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2146 - mean_squared_error: 0.21466/6 [======
Epoch 4/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2100 - mean_squared_error: 0.21006/6 [======
Epoch 5/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1660 - mean_squared_error: 0.16606/6 [======
Epoch 6/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2172 - mean_squared_error: 0.21726/6 [======
Epoch 7/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2214 - mean_squared_error: 0.22146/6 [======
Epoch 8/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2172 - mean_squared_error: 0.21726/6 [======
Epoch 9/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1679 - mean_squared_error: 0.16796/6 [======
Epoch 10/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2054 - mean_squared_error: 0.20546/6 [======
Epoch 11/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1498 - mean_squared_error: 0.14986/6 [======
Epoch 12/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1683 - mean_squared_error: 0.16836/6 [======
Epoch 13/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1857 - mean_squared_error: 0.18576/6 [======
Epoch 14/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1327 - mean_squared_error: 0.13276/6 [======
Epoch 15/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1950 - mean_squared_error: 0.19506/6 [======
Epoch 16/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1573 - mean_squared_error: 0.15736/6 [======
Epoch 17/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1771 - mean_squared_error: 0.17716/6 [======
Epoch 18/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2046 - mean_squared_error: 0.20466/6 [======
Epoch 19/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1660 - mean_squared_error: 0.16606/6 [======
Epoch 20/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1986 - mean_squared_error: 0.19866/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1566 - mean_squared_error: 0.15666/6 [======
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1891 - mean_squared_error: 0.18916/6 [======
Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1692 - mean_squared_error: 0.16926/6 [======
Epoch 24/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1544 - mean_squared_error: 0.15446/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1392 - mean_squared_error: 0.13926/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1648 - mean_squared_error: 0.16486/6 [======
Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1697 - mean_squared_error: 0.16976/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1843 - mean_squared_error: 0.18436/6 [======
Epoch 29/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.1560 - mean_squared_error: 0.15606/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1222 - mean_squared_error: 0.12226/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1277 - mean_squared_error: 0.12776/6 [======
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1325 - mean_squared_error: 0.13256/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1282 - mean_squared_error: 0.12826/6 [======
Epoch 34/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1260 - mean_squared_error: 0.12606/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1476 - mean_squared_error: 0.14766/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1537 - mean_squared_error: 0.15376/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1569 - mean_squared_error: 0.15696/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1496 - mean_squared_error: 0.14966/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1303 - mean_squared_error: 0.13036/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1470 - mean_squared_error: 0.14706/6 [======
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1531 - mean_squared_error: 0.15316/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1315 - mean_squared_error: 0.13156/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1177 - mean_squared_error: 0.11776/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1424 - mean_squared_error: 0.14246/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1181 - mean_squared_error: 0.11816/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1092 - mean_squared_error: 0.10926/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1316 - mean_squared_error: 0.13166/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1056 - mean_squared_error: 0.10566/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1153 - mean_squared_error: 0.11536/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1357 - mean_squared_error: 0.13576/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1064 - mean_squared_error: 0.10646/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0795 - mean_squared_error: 0.07956/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1541 - mean_squared_error: 0.15416/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1091 - mean_squared_error: 0.10916/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1036 - mean_squared_error: 0.10366/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0987 - mean_squared_error: 0.09876/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0940 - mean_squared_error: 0.09406/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0829 - mean_squared_error: 0.08296/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0378 - mean_squared_error: 0.03786/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1264 - mean_squared_error: 0.12646/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1199 - mean_squared_error: 0.11996/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1244 - mean_squared_error: 0.12446/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1254 - mean_squared_error: 0.12546/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1023 - mean_squared_error: 0.10236/6 [======
```

```
Epoch 65/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0894 – mean_squared_error: 0.08946/6 [======
Epoch 66/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0934 – mean_squared_error: 0.09346/6 [======
Epoch 67/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0794 – mean_squared_error: 0.07946/6 [======
Epoch 68/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0928 – mean_squared_error: 0.09286/6 [======
Epoch 69/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0910 – mean_squared_error: 0.09106/6 [======
Epoch 70/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0682 – mean_squared_error: 0.06826/6 [======
Epoch 71/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0999 – mean_squared_error: 0.09996/6 [======
Epoch 72/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1317 – mean_squared_error: 0.13176/6 [======
Epoch 73/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0871 – mean_squared_error: 0.08716/6 [======
Epoch 74/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1275 – mean_squared_error: 0.12756/6 [======
Epoch 75/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0563 – mean_squared_error: 0.05636/6 [======
Epoch 76/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1486 – mean_squared_error: 0.14866/6 [======
Epoch 77/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0623 – mean_squared_error: 0.06236/6 [======
Epoch 78/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0728 – mean_squared_error: 0.07286/6 [======
Epoch 79/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0757 – mean_squared_error: 0.07576/6 [======
Epoch 80/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1058 – mean_squared_error: 0.10586/6 [======
Epoch 81/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1040 – mean_squared_error: 0.10406/6 [======
Epoch 82/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0852 – mean_squared_error: 0.08526/6 [======
Epoch 83/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0760 – mean_squared_error: 0.07606/6 [======
Epoch 84/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0791 – mean_squared_error: 0.07916/6 [======
Epoch 85/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1354 – mean_squared_error: 0.13546/6 [======
Epoch 86/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0644 – mean_squared_error: 0.06446/6 [======
Epoch 87/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0953 – mean_squared_error: 0.09536/6 [======
Epoch 88/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0613 – mean_squared_error: 0.06136/6 [======
Epoch 89/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1008 – mean_squared_error: 0.10086/6 [======
Epoch 90/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1177 – mean_squared_error: 0.11776/6 [======
Epoch 91/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0893 – mean_squared_error: 0.08936/6 [======
Epoch 92/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0814 – mean_squared_error: 0.08146/6 [======
Epoch 93/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1602 – mean_squared_error: 0.16026/6 [======
Epoch 94/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0786 – mean_squared_error: 0.07866/6 [======
Epoch 95/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0519 – mean_squared_error: 0.05196/6 [======
Epoch 96/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0583 – mean_squared_error: 0.05836/6 [======
Epoch 97/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0872 – mean_squared_error: 0.08726/6 [======
Epoch 98/150
1/6 [====>.........................] – ETA: 0s – loss: 0.0737 – mean_squared_error: 0.07376/6 [======
Epoch 99/150
1/6 [====>.........................] – ETA: 0s – loss: 0.1104 – mean_squared_error: 0.11046/6 [======
Epoch 100/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.0425 - mean_squared_error: 0.04256/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0702 - mean_squared_error: 0.07026/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0857 - mean_squared_error: 0.08576/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0579 - mean_squared_error: 0.05796/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0932 - mean_squared_error: 0.09326/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0758 - mean_squared_error: 0.07586/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0785 - mean_squared_error: 0.07856/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0621 - mean_squared_error: 0.06216/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0680 - mean_squared_error: 0.06806/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0707 - mean_squared_error: 0.07076/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0927 - mean_squared_error: 0.09276/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0488 - mean_squared_error: 0.04886/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0725 - mean_squared_error: 0.07256/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0682 - mean_squared_error: 0.06826/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0801 - mean_squared_error: 0.08016/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0782 - mean_squared_error: 0.07826/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0334 - mean_squared_error: 0.03346/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0871 - mean_squared_error: 0.08716/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0575 - mean_squared_error: 0.05756/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1111 - mean_squared_error: 0.11116/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1257 - mean_squared_error: 0.12576/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1002 - mean_squared_error: 0.10026/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0935 - mean_squared_error: 0.09356/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0608 - mean_squared_error: 0.06086/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0362 - mean_squared_error: 0.03626/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0913 - mean_squared_error: 0.09136/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0916 - mean_squared_error: 0.09166/6 [======
Epoch 127/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1077 - mean_squared_error: 0.10776/6 [======
Epoch 128/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0364 - mean_squared_error: 0.03646/6 [======
Epoch 129/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0451 - mean_squared_error: 0.04516/6 [======
Epoch 130/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0824 - mean_squared_error: 0.08246/6 [======
Epoch 131/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0445 - mean_squared_error: 0.04456/6 [======
Epoch 132/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0577 - mean_squared_error: 0.05776/6 [======
Epoch 133/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0352 - mean_squared_error: 0.03526/6 [======
Epoch 134/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0812 - mean_squared_error: 0.08126/6 [======
Epoch 135/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0627 - mean_squared_error: 0.06276/6 [======
```

```
Epoch 136/150
1/6 [====>........................] - ETA: 0s - loss: 0.0722 - mean_squared_error: 0.07226/6 [======
Epoch 137/150
1/6 [====>........................] - ETA: 0s - loss: 0.0518 - mean_squared_error: 0.05186/6 [======
Epoch 138/150
1/6 [====>........................] - ETA: 0s - loss: 0.0697 - mean_squared_error: 0.06976/6 [======
Epoch 139/150
1/6 [====>........................] - ETA: 0s - loss: 0.0884 - mean_squared_error: 0.08846/6 [======
Epoch 140/150
1/6 [====>........................] - ETA: 0s - loss: 0.0723 - mean_squared_error: 0.07236/6 [======
Epoch 141/150
1/6 [====>........................] - ETA: 0s - loss: 0.0434 - mean_squared_error: 0.04346/6 [======
Epoch 142/150
1/6 [====>........................] - ETA: 0s - loss: 0.0528 - mean_squared_error: 0.05286/6 [======
Epoch 143/150
1/6 [====>........................] - ETA: 0s - loss: 0.0603 - mean_squared_error: 0.06036/6 [======
Epoch 144/150
1/6 [====>........................] - ETA: 0s - loss: 0.0946 - mean_squared_error: 0.09466/6 [======
Epoch 145/150
1/6 [====>........................] - ETA: 0s - loss: 0.0719 - mean_squared_error: 0.07196/6 [======
Epoch 146/150
1/6 [====>........................] - ETA: 0s - loss: 0.0536 - mean_squared_error: 0.05366/6 [======
Epoch 147/150
1/6 [====>........................] - ETA: 0s - loss: 0.0575 - mean_squared_error: 0.05756/6 [======
Epoch 148/150
1/6 [====>........................] - ETA: 0s - loss: 0.0669 - mean_squared_error: 0.06696/6 [======
Epoch 149/150
1/6 [====>........................] - ETA: 0s - loss: 0.0627 - mean_squared_error: 0.06276/6 [======
Epoch 150/150
1/6 [====>........................] - ETA: 0s - loss: 0.0382 - mean_squared_error: 0.03826/6 [======
```

```
MSE on Train Set for Training Model # 42  =  0.08038788157505959

MSE on Test Set for Training Model # 42  =  0.11113398230834813
```

```
              precision    recall  f1-score   support

           0       0.79      0.88      0.83        25
           1       0.91      0.83      0.87        36

    accuracy                           0.85        61
   macro avg       0.85      0.86      0.85        61
weighted avg       0.86      0.85      0.85        61
```

```
Training Model #  43


Epoch 1/150
1/6 [====>........................] - ETA: 0s - loss: 0.2582 - mean_squared_error: 0.25826/6 [======
Epoch 2/150
1/6 [====>........................] - ETA: 0s - loss: 0.2519 - mean_squared_error: 0.25196/6 [======
Epoch 3/150
1/6 [====>........................] - ETA: 0s - loss: 0.2545 - mean_squared_error: 0.25456/6 [======
Epoch 4/150
1/6 [====>........................] - ETA: 0s - loss: 0.2304 - mean_squared_error: 0.23046/6 [======
Epoch 5/150
1/6 [====>........................] - ETA: 0s - loss: 0.2310 - mean_squared_error: 0.23106/6 [======
Epoch 6/150
1/6 [====>........................] - ETA: 0s - loss: 0.2354 - mean_squared_error: 0.23546/6 [======
Epoch 7/150
1/6 [====>........................] - ETA: 0s - loss: 0.2181 - mean_squared_error: 0.21816/6 [======
Epoch 8/150
1/6 [====>........................] - ETA: 0s - loss: 0.2103 - mean_squared_error: 0.21036/6 [======
Epoch 9/150
1/6 [====>........................] - ETA: 0s - loss: 0.2229 - mean_squared_error: 0.22296/6 [======
Epoch 10/150
```

```
1/6 [====>........................] - ETA: 0s - loss: 0.1939 - mean_squared_error: 0.19396/6 [======
Epoch 11/150
1/6 [====>........................] - ETA: 0s - loss: 0.1712 - mean_squared_error: 0.17126/6 [======
Epoch 12/150
1/6 [====>........................] - ETA: 0s - loss: 0.1753 - mean_squared_error: 0.17536/6 [======
Epoch 13/150
1/6 [====>........................] - ETA: 0s - loss: 0.1695 - mean_squared_error: 0.16956/6 [======
Epoch 14/150
1/6 [====>........................] - ETA: 0s - loss: 0.1560 - mean_squared_error: 0.15606/6 [======
Epoch 15/150
1/6 [====>........................] - ETA: 0s - loss: 0.1708 - mean_squared_error: 0.17086/6 [======
Epoch 16/150
1/6 [====>........................] - ETA: 0s - loss: 0.1888 - mean_squared_error: 0.18886/6 [======
Epoch 17/150
1/6 [====>........................] - ETA: 0s - loss: 0.1211 - mean_squared_error: 0.12116/6 [======
Epoch 18/150
1/6 [====>........................] - ETA: 0s - loss: 0.1079 - mean_squared_error: 0.10796/6 [======
Epoch 19/150
1/6 [====>........................] - ETA: 0s - loss: 0.1371 - mean_squared_error: 0.13716/6 [======
Epoch 20/150
1/6 [====>........................] - ETA: 0s - loss: 0.1619 - mean_squared_error: 0.16196/6 [======
Epoch 21/150
1/6 [====>........................] - ETA: 0s - loss: 0.1207 - mean_squared_error: 0.12076/6 [======
Epoch 22/150
1/6 [====>........................] - ETA: 0s - loss: 0.1290 - mean_squared_error: 0.12906/6 [======
Epoch 23/150
1/6 [====>........................] - ETA: 0s - loss: 0.1940 - mean_squared_error: 0.19406/6 [======
Epoch 24/150
1/6 [====>........................] - ETA: 0s - loss: 0.1591 - mean_squared_error: 0.15916/6 [======
Epoch 25/150
1/6 [====>........................] - ETA: 0s - loss: 0.1339 - mean_squared_error: 0.13396/6 [======
Epoch 26/150
1/6 [====>........................] - ETA: 0s - loss: 0.1011 - mean_squared_error: 0.10116/6 [======
Epoch 27/150
1/6 [====>........................] - ETA: 0s - loss: 0.1758 - mean_squared_error: 0.17586/6 [======
Epoch 28/150
1/6 [====>........................] - ETA: 0s - loss: 0.1688 - mean_squared_error: 0.16886/6 [======
Epoch 29/150
1/6 [====>........................] - ETA: 0s - loss: 0.1140 - mean_squared_error: 0.11406/6 [======
Epoch 30/150
1/6 [====>........................] - ETA: 0s - loss: 0.1572 - mean_squared_error: 0.15726/6 [======
Epoch 31/150
1/6 [====>........................] - ETA: 0s - loss: 0.1058 - mean_squared_error: 0.10586/6 [======
Epoch 32/150
1/6 [====>........................] - ETA: 0s - loss: 0.0914 - mean_squared_error: 0.09146/6 [======
Epoch 33/150
1/6 [====>........................] - ETA: 0s - loss: 0.1270 - mean_squared_error: 0.12706/6 [======
Epoch 34/150
1/6 [====>........................] - ETA: 0s - loss: 0.1221 - mean_squared_error: 0.12216/6 [======
Epoch 35/150
1/6 [====>........................] - ETA: 0s - loss: 0.1070 - mean_squared_error: 0.10706/6 [======
Epoch 36/150
1/6 [====>........................] - ETA: 0s - loss: 0.1539 - mean_squared_error: 0.15396/6 [======
Epoch 37/150
1/6 [====>........................] - ETA: 0s - loss: 0.1205 - mean_squared_error: 0.12056/6 [======
Epoch 38/150
1/6 [====>........................] - ETA: 0s - loss: 0.0828 - mean_squared_error: 0.08286/6 [======
Epoch 39/150
1/6 [====>........................] - ETA: 0s - loss: 0.0835 - mean_squared_error: 0.08356/6 [======
Epoch 40/150
1/6 [====>........................] - ETA: 0s - loss: 0.1088 - mean_squared_error: 0.10886/6 [======
Epoch 41/150
1/6 [====>........................] - ETA: 0s - loss: 0.1207 - mean_squared_error: 0.12076/6 [======
Epoch 42/150
1/6 [====>........................] - ETA: 0s - loss: 0.1075 - mean_squared_error: 0.10756/6 [======
Epoch 43/150
1/6 [====>........................] - ETA: 0s - loss: 0.1516 - mean_squared_error: 0.15166/6 [======
Epoch 44/150
1/6 [====>........................] - ETA: 0s - loss: 0.0711 - mean_squared_error: 0.07116/6 [======
Epoch 45/150
1/6 [====>........................] - ETA: 0s - loss: 0.0746 - mean_squared_error: 0.07466/6 [======
```

```
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1255 - mean_squared_error: 0.12556/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0848 - mean_squared_error: 0.08486/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0641 - mean_squared_error: 0.06416/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0603 - mean_squared_error: 0.06036/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0833 - mean_squared_error: 0.08336/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1048 - mean_squared_error: 0.10486/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1005 - mean_squared_error: 0.10056/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1339 - mean_squared_error: 0.13396/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1440 - mean_squared_error: 0.14406/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1441 - mean_squared_error: 0.14416/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1449 - mean_squared_error: 0.14496/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1038 - mean_squared_error: 0.10386/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0878 - mean_squared_error: 0.08786/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1170 - mean_squared_error: 0.11706/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0928 - mean_squared_error: 0.09286/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0544 - mean_squared_error: 0.05446/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0866 - mean_squared_error: 0.08666/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0809 - mean_squared_error: 0.08096/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1015 - mean_squared_error: 0.10156/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0788 - mean_squared_error: 0.07886/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0728 - mean_squared_error: 0.07286/6 [======
Epoch 67/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0927 - mean_squared_error: 0.09276/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1082 - mean_squared_error: 0.10826/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0826 - mean_squared_error: 0.08266/6 [======
Epoch 70/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1320 - mean_squared_error: 0.13206/6 [======
Epoch 71/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1413 - mean_squared_error: 0.14136/6 [======
Epoch 72/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0438 - mean_squared_error: 0.04386/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1080 - mean_squared_error: 0.10806/6 [======
Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0797 - mean_squared_error: 0.07976/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0983 - mean_squared_error: 0.09836/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1053 - mean_squared_error: 0.10536/6 [======
Epoch 77/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1029 - mean_squared_error: 0.10296/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0682 - mean_squared_error: 0.06826/6 [======
Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0868 - mean_squared_error: 0.08686/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1084 - mean_squared_error: 0.10846/6 [======
Epoch 81/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.0756 - mean_squared_error: 0.07566/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0820 - mean_squared_error: 0.08206/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0794 - mean_squared_error: 0.07946/6 [======
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0736 - mean_squared_error: 0.07366/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0772 - mean_squared_error: 0.07726/6 [======
Epoch 86/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0266 - mean_squared_error: 0.02666/6 [======
Epoch 87/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1073 - mean_squared_error: 0.10736/6 [======
Epoch 88/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1359 - mean_squared_error: 0.13596/6 [======
Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1112 - mean_squared_error: 0.11126/6 [======
Epoch 90/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1010 - mean_squared_error: 0.10106/6 [======
Epoch 91/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0981 - mean_squared_error: 0.09816/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0664 - mean_squared_error: 0.06646/6 [======
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0464 - mean_squared_error: 0.04646/6 [======
Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1523 - mean_squared_error: 0.15236/6 [======
Epoch 95/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0653 - mean_squared_error: 0.06536/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1138 - mean_squared_error: 0.11386/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1374 - mean_squared_error: 0.13746/6 [======
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0659 - mean_squared_error: 0.06596/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0823 - mean_squared_error: 0.08236/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0818 - mean_squared_error: 0.08186/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0500 - mean_squared_error: 0.05006/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0316 - mean_squared_error: 0.03166/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0747 - mean_squared_error: 0.07476/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0777 - mean_squared_error: 0.07776/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0553 - mean_squared_error: 0.05536/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0953 - mean_squared_error: 0.09536/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1032 - mean_squared_error: 0.10326/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1045 - mean_squared_error: 0.10456/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0870 - mean_squared_error: 0.08706/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0749 - mean_squared_error: 0.07496/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1024 - mean_squared_error: 0.10246/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0786 - mean_squared_error: 0.07866/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1387 - mean_squared_error: 0.13876/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0629 - mean_squared_error: 0.06296/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0363 - mean_squared_error: 0.03636/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0599 - mean_squared_error: 0.05996/6 [======
```

```
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0576 - mean_squared_error: 0.05766/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0961 - mean_squared_error: 0.09616/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0897 - mean_squared_error: 0.08976/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1124 - mean_squared_error: 0.11246/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0383 - mean_squared_error: 0.03836/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0456 - mean_squared_error: 0.04566/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0727 - mean_squared_error: 0.07276/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0469 - mean_squared_error: 0.04696/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0594 - mean_squared_error: 0.05946/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0486 - mean_squared_error: 0.04866/6 [======
Epoch 127/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0820 - mean_squared_error: 0.08206/6 [======
Epoch 128/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0829 - mean_squared_error: 0.08296/6 [======
Epoch 129/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0363 - mean_squared_error: 0.03636/6 [======
Epoch 130/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0759 - mean_squared_error: 0.07596/6 [======
Epoch 131/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0635 - mean_squared_error: 0.06356/6 [======
Epoch 132/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0623 - mean_squared_error: 0.06236/6 [======
Epoch 133/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0658 - mean_squared_error: 0.06586/6 [======
Epoch 134/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0352 - mean_squared_error: 0.03526/6 [======
Epoch 135/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0908 - mean_squared_error: 0.09086/6 [======
Epoch 136/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0521 - mean_squared_error: 0.05216/6 [======
Epoch 137/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0550 - mean_squared_error: 0.05506/6 [======
Epoch 138/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0641 - mean_squared_error: 0.06416/6 [======
Epoch 139/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0721 - mean_squared_error: 0.07216/6 [======
Epoch 140/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0259 - mean_squared_error: 0.02596/6 [======
Epoch 141/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0595 - mean_squared_error: 0.05956/6 [======
Epoch 142/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0548 - mean_squared_error: 0.05486/6 [======
Epoch 143/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0419 - mean_squared_error: 0.04196/6 [======
Epoch 144/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0587 - mean_squared_error: 0.05876/6 [======
Epoch 145/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1158 - mean_squared_error: 0.11586/6 [======
Epoch 146/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0279 - mean_squared_error: 0.02796/6 [======
Epoch 147/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0596 - mean_squared_error: 0.05966/6 [======
Epoch 148/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0438 - mean_squared_error: 0.04386/6 [======
Epoch 149/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0843 - mean_squared_error: 0.08436/6 [======
Epoch 150/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0588 - mean_squared_error: 0.05886/6 [======
```

```
MSE on Train Set for Training Model # 43  =  0.08358240250487323

MSE on Test Set for Training Model # 43  =  0.12914554514491902

              precision   recall  f1-score   support

          0       0.75     0.84      0.79        25
          1       0.88     0.81      0.84        36

    accuracy                         0.82        61
   macro avg       0.81     0.82      0.82        61
weighted avg       0.83     0.82      0.82        61




Training Model #  44


Epoch 1/150
1/6 [====>.........................] - ETA: 0s - loss: 0.3451 - mean_squared_error: 0.34516/6 [======
Epoch 2/150
1/6 [====>.........................] - ETA: 0s - loss: 0.3221 - mean_squared_error: 0.32216/6 [======
Epoch 3/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2628 - mean_squared_error: 0.26286/6 [======
Epoch 4/150
1/6 [====>.........................] - ETA: 0s - loss: 0.3213 - mean_squared_error: 0.32136/6 [======
Epoch 5/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2844 - mean_squared_error: 0.28446/6 [======
Epoch 6/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2656 - mean_squared_error: 0.26566/6 [======
Epoch 7/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2393 - mean_squared_error: 0.23936/6 [======
Epoch 8/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2632 - mean_squared_error: 0.26326/6 [======
Epoch 9/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2559 - mean_squared_error: 0.25596/6 [======
Epoch 10/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2499 - mean_squared_error: 0.24996/6 [======
Epoch 11/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2316 - mean_squared_error: 0.23166/6 [======
Epoch 12/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2460 - mean_squared_error: 0.24606/6 [======
Epoch 13/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2624 - mean_squared_error: 0.26246/6 [======
Epoch 14/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2354 - mean_squared_error: 0.23546/6 [======
Epoch 15/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2487 - mean_squared_error: 0.24876/6 [======
Epoch 16/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2059 - mean_squared_error: 0.20596/6 [======
Epoch 17/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2078 - mean_squared_error: 0.20786/6 [======
Epoch 18/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2248 - mean_squared_error: 0.22486/6 [======
Epoch 19/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2164 - mean_squared_error: 0.21646/6 [======
Epoch 20/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1975 - mean_squared_error: 0.19756/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2036 - mean_squared_error: 0.20366/6 [======
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2019 - mean_squared_error: 0.20196/6 [======
Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2028 - mean_squared_error: 0.20286/6 [======
Epoch 24/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2099 - mean_squared_error: 0.20996/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1870 - mean_squared_error: 0.18706/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1823 - mean_squared_error: 0.18236/6 [======
```

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Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1891 - mean_squared_error: 0.18916/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1928 - mean_squared_error: 0.19286/6 [======
Epoch 29/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1891 - mean_squared_error: 0.18916/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1833 - mean_squared_error: 0.18336/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1942 - mean_squared_error: 0.19426/6 [======
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1587 - mean_squared_error: 0.15876/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1617 - mean_squared_error: 0.16176/6 [======
Epoch 34/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1853 - mean_squared_error: 0.18536/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1703 - mean_squared_error: 0.17036/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1488 - mean_squared_error: 0.14886/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1828 - mean_squared_error: 0.18286/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1893 - mean_squared_error: 0.18936/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1682 - mean_squared_error: 0.16826/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2082 - mean_squared_error: 0.20826/6 [======
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2022 - mean_squared_error: 0.20226/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1653 - mean_squared_error: 0.16536/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1652 - mean_squared_error: 0.16526/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1093 - mean_squared_error: 0.10936/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1664 - mean_squared_error: 0.16646/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1794 - mean_squared_error: 0.17946/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1705 - mean_squared_error: 0.17056/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1420 - mean_squared_error: 0.14206/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1493 - mean_squared_error: 0.14936/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0961 - mean_squared_error: 0.09616/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1462 - mean_squared_error: 0.14626/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1102 - mean_squared_error: 0.11026/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1511 - mean_squared_error: 0.15116/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1481 - mean_squared_error: 0.14816/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1217 - mean_squared_error: 0.12176/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1086 - mean_squared_error: 0.10866/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1469 - mean_squared_error: 0.14696/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1257 - mean_squared_error: 0.12576/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1400 - mean_squared_error: 0.14006/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1310 - mean_squared_error: 0.13106/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1872 - mean_squared_error: 0.18726/6 [======
Epoch 62/150
```

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1/6 [====>.........................] - ETA: 0s - loss: 0.1652 - mean_squared_error: 0.16526/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1573 - mean_squared_error: 0.15736/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1324 - mean_squared_error: 0.13246/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1695 - mean_squared_error: 0.16956/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0950 - mean_squared_error: 0.09506/6 [======
Epoch 67/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1330 - mean_squared_error: 0.13306/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1246 - mean_squared_error: 0.12466/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1142 - mean_squared_error: 0.11426/6 [======
Epoch 70/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1528 - mean_squared_error: 0.15286/6 [======
Epoch 71/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0951 - mean_squared_error: 0.09516/6 [======
Epoch 72/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1293 - mean_squared_error: 0.12936/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1342 - mean_squared_error: 0.13426/6 [======
Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0847 - mean_squared_error: 0.08476/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0681 - mean_squared_error: 0.06816/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0817 - mean_squared_error: 0.08176/6 [======
Epoch 77/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0835 - mean_squared_error: 0.08356/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1354 - mean_squared_error: 0.13546/6 [======
Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0906 - mean_squared_error: 0.09066/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0951 - mean_squared_error: 0.09516/6 [======
Epoch 81/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1362 - mean_squared_error: 0.13626/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0802 - mean_squared_error: 0.08026/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1139 - mean_squared_error: 0.11396/6 [======
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1012 - mean_squared_error: 0.10126/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1411 - mean_squared_error: 0.14116/6 [======
Epoch 86/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1158 - mean_squared_error: 0.11586/6 [======
Epoch 87/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1004 - mean_squared_error: 0.10046/6 [======
Epoch 88/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1530 - mean_squared_error: 0.15306/6 [======
Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0737 - mean_squared_error: 0.07376/6 [======
Epoch 90/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0919 - mean_squared_error: 0.09196/6 [======
Epoch 91/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1391 - mean_squared_error: 0.13916/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1059 - mean_squared_error: 0.10596/6 [======
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1138 - mean_squared_error: 0.11386/6 [======
Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0949 - mean_squared_error: 0.09496/6 [======
Epoch 95/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0954 - mean_squared_error: 0.09546/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0806 - mean_squared_error: 0.08066/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0507 - mean_squared_error: 0.05076/6 [======
```

```
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0749 - mean_squared_error: 0.07496/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1227 - mean_squared_error: 0.12276/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0801 - mean_squared_error: 0.08016/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0666 - mean_squared_error: 0.06666/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0722 - mean_squared_error: 0.07226/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0665 - mean_squared_error: 0.06656/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0786 - mean_squared_error: 0.07866/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0708 - mean_squared_error: 0.07086/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1208 - mean_squared_error: 0.12086/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0713 - mean_squared_error: 0.07136/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1050 - mean_squared_error: 0.10506/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0902 - mean_squared_error: 0.09026/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1158 - mean_squared_error: 0.11586/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0691 - mean_squared_error: 0.06916/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1043 - mean_squared_error: 0.10436/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0827 - mean_squared_error: 0.08276/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0751 - mean_squared_error: 0.07516/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0886 - mean_squared_error: 0.08866/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0968 - mean_squared_error: 0.09686/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1549 - mean_squared_error: 0.15496/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0545 - mean_squared_error: 0.05456/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0652 - mean_squared_error: 0.06526/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1062 - mean_squared_error: 0.10626/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0854 - mean_squared_error: 0.08546/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0556 - mean_squared_error: 0.05566/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0537 - mean_squared_error: 0.05376/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1244 - mean_squared_error: 0.12446/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0711 - mean_squared_error: 0.07116/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0685 - mean_squared_error: 0.06856/6 [======
Epoch 127/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0598 - mean_squared_error: 0.05986/6 [======
Epoch 128/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0659 - mean_squared_error: 0.06596/6 [======
Epoch 129/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1004 - mean_squared_error: 0.10046/6 [======
Epoch 130/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0540 - mean_squared_error: 0.05406/6 [======
Epoch 131/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0626 - mean_squared_error: 0.06266/6 [======
Epoch 132/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0862 - mean_squared_error: 0.08626/6 [======
Epoch 133/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.0886 - mean_squared_error: 0.08866/6 [======
Epoch 134/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1090 - mean_squared_error: 0.10906/6 [======
Epoch 135/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0559 - mean_squared_error: 0.05596/6 [======
Epoch 136/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0785 - mean_squared_error: 0.07856/6 [======
Epoch 137/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0487 - mean_squared_error: 0.04876/6 [======
Epoch 138/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0910 - mean_squared_error: 0.09106/6 [======
Epoch 139/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0664 - mean_squared_error: 0.06646/6 [======
Epoch 140/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0398 - mean_squared_error: 0.03986/6 [======
Epoch 141/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0655 - mean_squared_error: 0.06556/6 [======
Epoch 142/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0842 - mean_squared_error: 0.08426/6 [======
Epoch 143/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0742 - mean_squared_error: 0.07426/6 [======
Epoch 144/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0631 - mean_squared_error: 0.06316/6 [======
Epoch 145/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0490 - mean_squared_error: 0.04906/6 [======
Epoch 146/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1401 - mean_squared_error: 0.14016/6 [======
Epoch 147/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0737 - mean_squared_error: 0.07376/6 [======
Epoch 148/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0631 - mean_squared_error: 0.06316/6 [======
Epoch 149/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0474 - mean_squared_error: 0.04746/6 [======
Epoch 150/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0729 - mean_squared_error: 0.07296/6 [======


MSE on Train Set for Training Model # 44  =  0.08442306177399904

MSE on Test Set for Training Model # 44  =  0.08007296068094968

              precision    recall  f1-score   support

           0       0.86      0.96      0.91        25
           1       0.97      0.89      0.93        36

    accuracy                           0.92        61
   macro avg       0.91      0.92      0.92        61
weighted avg       0.92      0.92      0.92        61



Training Model #  45


Epoch 1/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2717 - mean_squared_error: 0.27176/6 [======
Epoch 2/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2535 - mean_squared_error: 0.25356/6 [======
Epoch 3/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2333 - mean_squared_error: 0.23336/6 [======
Epoch 4/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2676 - mean_squared_error: 0.26766/6 [======
Epoch 5/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2360 - mean_squared_error: 0.23606/6 [======
Epoch 6/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1912 - mean_squared_error: 0.19126/6 [======
Epoch 7/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2185 - mean_squared_error: 0.21856/6 [======
```

```
Epoch 8/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2038 - mean_squared_error: 0.20386/6 [======
Epoch 9/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2031 - mean_squared_error: 0.20316/6 [======
Epoch 10/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2091 - mean_squared_error: 0.20916/6 [======
Epoch 11/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2068 - mean_squared_error: 0.20686/6 [======
Epoch 12/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1597 - mean_squared_error: 0.15976/6 [======
Epoch 13/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1914 - mean_squared_error: 0.19146/6 [======
Epoch 14/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1966 - mean_squared_error: 0.19666/6 [======
Epoch 15/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1794 - mean_squared_error: 0.17946/6 [======
Epoch 16/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1680 - mean_squared_error: 0.16806/6 [======
Epoch 17/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1387 - mean_squared_error: 0.13876/6 [======
Epoch 18/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1830 - mean_squared_error: 0.18306/6 [======
Epoch 19/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1727 - mean_squared_error: 0.17276/6 [======
Epoch 20/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1925 - mean_squared_error: 0.19256/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1992 - mean_squared_error: 0.19926/6 [======
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1772 - mean_squared_error: 0.17726/6 [======
Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1572 - mean_squared_error: 0.15726/6 [======
Epoch 24/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1498 - mean_squared_error: 0.14986/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1253 - mean_squared_error: 0.12536/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1472 - mean_squared_error: 0.14726/6 [======
Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1829 - mean_squared_error: 0.18296/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1547 - mean_squared_error: 0.15476/6 [======
Epoch 29/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1518 - mean_squared_error: 0.15186/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1361 - mean_squared_error: 0.13616/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1309 - mean_squared_error: 0.13096/6 [======
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1348 - mean_squared_error: 0.13486/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1239 - mean_squared_error: 0.12396/6 [======
Epoch 34/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1729 - mean_squared_error: 0.17296/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1307 - mean_squared_error: 0.13076/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1181 - mean_squared_error: 0.11816/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1533 - mean_squared_error: 0.15336/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0840 - mean_squared_error: 0.08406/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1378 - mean_squared_error: 0.13786/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1435 - mean_squared_error: 0.14356/6 [======
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0896 - mean_squared_error: 0.08966/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1332 - mean_squared_error: 0.13326/6 [======
Epoch 43/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.1116 - mean_squared_error: 0.11166/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1403 - mean_squared_error: 0.14036/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0936 - mean_squared_error: 0.09366/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1297 - mean_squared_error: 0.12976/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1153 - mean_squared_error: 0.11536/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1815 - mean_squared_error: 0.18156/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1424 - mean_squared_error: 0.14246/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1320 - mean_squared_error: 0.13206/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0979 - mean_squared_error: 0.09796/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1509 - mean_squared_error: 0.15096/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0938 - mean_squared_error: 0.09386/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0698 - mean_squared_error: 0.06986/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1097 - mean_squared_error: 0.10976/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1131 - mean_squared_error: 0.11316/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1286 - mean_squared_error: 0.12866/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1400 - mean_squared_error: 0.14006/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1041 - mean_squared_error: 0.10416/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1249 - mean_squared_error: 0.12496/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0735 - mean_squared_error: 0.07356/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0783 - mean_squared_error: 0.07836/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0923 - mean_squared_error: 0.09236/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1067 - mean_squared_error: 0.10676/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0648 - mean_squared_error: 0.06486/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1045 - mean_squared_error: 0.10456/6 [======
Epoch 67/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1191 - mean_squared_error: 0.11916/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1117 - mean_squared_error: 0.11176/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0703 - mean_squared_error: 0.07036/6 [======
Epoch 70/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1181 - mean_squared_error: 0.11816/6 [======
Epoch 71/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0740 - mean_squared_error: 0.07406/6 [======
Epoch 72/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0942 - mean_squared_error: 0.09426/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1189 - mean_squared_error: 0.11896/6 [======
Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1132 - mean_squared_error: 0.11326/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0798 - mean_squared_error: 0.07986/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0906 - mean_squared_error: 0.09066/6 [======
Epoch 77/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1050 - mean_squared_error: 0.10506/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1051 - mean_squared_error: 0.10516/6 [======
```

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Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0856 - mean_squared_error: 0.08566/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0782 - mean_squared_error: 0.07826/6 [======
Epoch 81/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0833 - mean_squared_error: 0.08336/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0615 - mean_squared_error: 0.06156/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0967 - mean_squared_error: 0.09676/6 [======
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0682 - mean_squared_error: 0.06826/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1330 - mean_squared_error: 0.13306/6 [======
Epoch 86/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0999 - mean_squared_error: 0.09996/6 [======
Epoch 87/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0813 - mean_squared_error: 0.08136/6 [======
Epoch 88/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1018 - mean_squared_error: 0.10186/6 [======
Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0906 - mean_squared_error: 0.09066/6 [======
Epoch 90/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1225 - mean_squared_error: 0.12256/6 [======
Epoch 91/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1244 - mean_squared_error: 0.12446/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0744 - mean_squared_error: 0.07446/6 [======
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0717 - mean_squared_error: 0.07176/6 [======
Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0815 - mean_squared_error: 0.08156/6 [======
Epoch 95/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0835 - mean_squared_error: 0.08356/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1003 - mean_squared_error: 0.10036/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0629 - mean_squared_error: 0.06296/6 [======
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1019 - mean_squared_error: 0.10196/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0742 - mean_squared_error: 0.07426/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0984 - mean_squared_error: 0.09846/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0697 - mean_squared_error: 0.06976/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0820 - mean_squared_error: 0.08206/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0867 - mean_squared_error: 0.08676/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0974 - mean_squared_error: 0.09746/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0523 - mean_squared_error: 0.05236/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0599 - mean_squared_error: 0.05996/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0497 - mean_squared_error: 0.04976/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0745 - mean_squared_error: 0.07456/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0925 - mean_squared_error: 0.09256/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0747 - mean_squared_error: 0.07476/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0919 - mean_squared_error: 0.09196/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1011 - mean_squared_error: 0.10116/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0746 - mean_squared_error: 0.07466/6 [======
Epoch 114/150
```

```
1/6 [====>........................] - ETA: 0s - loss: 0.0954 - mean_squared_error: 0.09546/6 [======
Epoch 115/150
1/6 [====>........................] - ETA: 0s - loss: 0.0657 - mean_squared_error: 0.06576/6 [======
Epoch 116/150
1/6 [====>........................] - ETA: 0s - loss: 0.0712 - mean_squared_error: 0.07126/6 [======
Epoch 117/150
1/6 [====>........................] - ETA: 0s - loss: 0.1071 - mean_squared_error: 0.10716/6 [======
Epoch 118/150
1/6 [====>........................] - ETA: 0s - loss: 0.1695 - mean_squared_error: 0.16956/6 [======
Epoch 119/150
1/6 [====>........................] - ETA: 0s - loss: 0.1216 - mean_squared_error: 0.12166/6 [======
Epoch 120/150
1/6 [====>........................] - ETA: 0s - loss: 0.0863 - mean_squared_error: 0.08636/6 [======
Epoch 121/150
1/6 [====>........................] - ETA: 0s - loss: 0.0507 - mean_squared_error: 0.05076/6 [======
Epoch 122/150
1/6 [====>........................] - ETA: 0s - loss: 0.0599 - mean_squared_error: 0.05996/6 [======
Epoch 123/150
1/6 [====>........................] - ETA: 0s - loss: 0.0677 - mean_squared_error: 0.06776/6 [======
Epoch 124/150
1/6 [====>........................] - ETA: 0s - loss: 0.1164 - mean_squared_error: 0.11646/6 [======
Epoch 125/150
1/6 [====>........................] - ETA: 0s - loss: 0.0709 - mean_squared_error: 0.07096/6 [======
Epoch 126/150
1/6 [====>........................] - ETA: 0s - loss: 0.0481 - mean_squared_error: 0.04816/6 [======
Epoch 127/150
1/6 [====>........................] - ETA: 0s - loss: 0.1051 - mean_squared_error: 0.10516/6 [======
Epoch 128/150
1/6 [====>........................] - ETA: 0s - loss: 0.1025 - mean_squared_error: 0.10256/6 [======
Epoch 129/150
1/6 [====>........................] - ETA: 0s - loss: 0.0510 - mean_squared_error: 0.05106/6 [======
Epoch 130/150
1/6 [====>........................] - ETA: 0s - loss: 0.1053 - mean_squared_error: 0.10536/6 [======
Epoch 131/150
1/6 [====>........................] - ETA: 0s - loss: 0.0695 - mean_squared_error: 0.06956/6 [======
Epoch 132/150
1/6 [====>........................] - ETA: 0s - loss: 0.0441 - mean_squared_error: 0.04416/6 [======
Epoch 133/150
1/6 [====>........................] - ETA: 0s - loss: 0.0781 - mean_squared_error: 0.07816/6 [======
Epoch 134/150
1/6 [====>........................] - ETA: 0s - loss: 0.0885 - mean_squared_error: 0.08856/6 [======
Epoch 135/150
1/6 [====>........................] - ETA: 0s - loss: 0.1326 - mean_squared_error: 0.13266/6 [======
Epoch 136/150
1/6 [====>........................] - ETA: 0s - loss: 0.0802 - mean_squared_error: 0.08026/6 [======
Epoch 137/150
1/6 [====>........................] - ETA: 0s - loss: 0.0740 - mean_squared_error: 0.07406/6 [======
Epoch 138/150
1/6 [====>........................] - ETA: 0s - loss: 0.0618 - mean_squared_error: 0.06186/6 [======
Epoch 139/150
1/6 [====>........................] - ETA: 0s - loss: 0.0434 - mean_squared_error: 0.04346/6 [======
Epoch 140/150
1/6 [====>........................] - ETA: 0s - loss: 0.0651 - mean_squared_error: 0.06516/6 [======
Epoch 141/150
1/6 [====>........................] - ETA: 0s - loss: 0.1088 - mean_squared_error: 0.10886/6 [======
Epoch 142/150
1/6 [====>........................] - ETA: 0s - loss: 0.0587 - mean_squared_error: 0.05876/6 [======
Epoch 143/150
1/6 [====>........................] - ETA: 0s - loss: 0.0826 - mean_squared_error: 0.08266/6 [======
Epoch 144/150
1/6 [====>........................] - ETA: 0s - loss: 0.0522 - mean_squared_error: 0.05226/6 [======
Epoch 145/150
1/6 [====>........................] - ETA: 0s - loss: 0.0311 - mean_squared_error: 0.03116/6 [======
Epoch 146/150
1/6 [====>........................] - ETA: 0s - loss: 0.0678 - mean_squared_error: 0.06786/6 [======
Epoch 147/150
1/6 [====>........................] - ETA: 0s - loss: 0.0674 - mean_squared_error: 0.06746/6 [======
Epoch 148/150
1/6 [====>........................] - ETA: 0s - loss: 0.0581 - mean_squared_error: 0.05816/6 [======
Epoch 149/150
1/6 [====>........................] - ETA: 0s - loss: 0.0821 - mean_squared_error: 0.08216/6 [======
```

```
Epoch 150/150
1/6 [===>..........................] - ETA: 0s - loss: 0.0378 - mean_squared_error: 0.03786/6 [======
```

MSE on Train Set for Training Model # 45 = 0.08926709809188098

MSE on Test Set for Training Model # 45 = 0.10146907327531454

```
              precision    recall  f1-score   support

           0       0.81      0.84      0.82        25
           1       0.89      0.86      0.87        36

    accuracy                           0.85        61
   macro avg       0.85      0.85      0.85        61
weighted avg       0.85      0.85      0.85        61
```

```
Training Model #  46


Epoch 1/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2100 - mean_squared_error: 0.21006/6 [======
Epoch 2/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2378 - mean_squared_error: 0.23786/6 [======
Epoch 3/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2039 - mean_squared_error: 0.20396/6 [======
Epoch 4/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2284 - mean_squared_error: 0.22846/6 [======
Epoch 5/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1975 - mean_squared_error: 0.19756/6 [======
Epoch 6/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1952 - mean_squared_error: 0.19526/6 [======
Epoch 7/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2150 - mean_squared_error: 0.21506/6 [======
Epoch 8/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1524 - mean_squared_error: 0.15246/6 [======
Epoch 9/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1731 - mean_squared_error: 0.17316/6 [======
Epoch 10/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1769 - mean_squared_error: 0.17696/6 [======
Epoch 11/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1553 - mean_squared_error: 0.15536/6 [======
Epoch 12/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1792 - mean_squared_error: 0.17926/6 [======
Epoch 13/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2105 - mean_squared_error: 0.21056/6 [======
Epoch 14/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2019 - mean_squared_error: 0.20196/6 [======
Epoch 15/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1582 - mean_squared_error: 0.15826/6 [======
Epoch 16/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2176 - mean_squared_error: 0.21766/6 [======
Epoch 17/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2036 - mean_squared_error: 0.20366/6 [======
Epoch 18/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1658 - mean_squared_error: 0.16586/6 [======
Epoch 19/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1768 - mean_squared_error: 0.17686/6 [======
Epoch 20/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1480 - mean_squared_error: 0.14806/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2112 - mean_squared_error: 0.21126/6 [======
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1761 - mean_squared_error: 0.17616/6 [======
Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1803 - mean_squared_error: 0.18036/6 [======
Epoch 24/150
```

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1/6 [====>.........................] - ETA: 0s - loss: 0.1881 - mean_squared_error: 0.18816/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1676 - mean_squared_error: 0.16766/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1339 - mean_squared_error: 0.13396/6 [======
Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1892 - mean_squared_error: 0.18926/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1308 - mean_squared_error: 0.13086/6 [======
Epoch 29/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1383 - mean_squared_error: 0.13836/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1554 - mean_squared_error: 0.15546/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1244 - mean_squared_error: 0.12446/6 [======
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1248 - mean_squared_error: 0.12486/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0951 - mean_squared_error: 0.09516/6 [======
Epoch 34/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1418 - mean_squared_error: 0.14186/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1299 - mean_squared_error: 0.12996/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1428 - mean_squared_error: 0.14286/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1118 - mean_squared_error: 0.11186/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1422 - mean_squared_error: 0.14226/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1296 - mean_squared_error: 0.12966/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0937 - mean_squared_error: 0.09376/6 [======
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1427 - mean_squared_error: 0.14276/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1236 - mean_squared_error: 0.12366/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1309 - mean_squared_error: 0.13096/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1126 - mean_squared_error: 0.11266/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1187 - mean_squared_error: 0.11876/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1277 - mean_squared_error: 0.12776/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0928 - mean_squared_error: 0.09286/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0944 - mean_squared_error: 0.09446/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1103 - mean_squared_error: 0.11036/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1211 - mean_squared_error: 0.12116/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0781 - mean_squared_error: 0.07816/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0950 - mean_squared_error: 0.09506/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1191 - mean_squared_error: 0.11916/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0933 - mean_squared_error: 0.09336/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0583 - mean_squared_error: 0.05836/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0634 - mean_squared_error: 0.06346/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1074 - mean_squared_error: 0.10746/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1222 - mean_squared_error: 0.12226/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1073 - mean_squared_error: 0.10736/6 [======
```

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Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0986 - mean_squared_error: 0.09866/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0858 - mean_squared_error: 0.08586/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0664 - mean_squared_error: 0.06646/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1163 - mean_squared_error: 0.11636/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1001 - mean_squared_error: 0.10016/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0909 - mean_squared_error: 0.09096/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1200 - mean_squared_error: 0.12006/6 [======
Epoch 67/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1240 - mean_squared_error: 0.12406/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0858 - mean_squared_error: 0.08586/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1083 - mean_squared_error: 0.10836/6 [======
Epoch 70/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1059 - mean_squared_error: 0.10596/6 [======
Epoch 71/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0783 - mean_squared_error: 0.07836/6 [======
Epoch 72/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0985 - mean_squared_error: 0.09856/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1349 - mean_squared_error: 0.13496/6 [======
Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0694 - mean_squared_error: 0.06946/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1021 - mean_squared_error: 0.10216/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1399 - mean_squared_error: 0.13996/6 [======
Epoch 77/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1353 - mean_squared_error: 0.13536/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0959 - mean_squared_error: 0.09596/6 [======
Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0979 - mean_squared_error: 0.09796/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1079 - mean_squared_error: 0.10796/6 [======
Epoch 81/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1335 - mean_squared_error: 0.13356/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0924 - mean_squared_error: 0.09246/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0965 - mean_squared_error: 0.09656/6 [======
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0863 - mean_squared_error: 0.08636/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0953 - mean_squared_error: 0.09536/6 [======
Epoch 86/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0877 - mean_squared_error: 0.08776/6 [======
Epoch 87/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1016 - mean_squared_error: 0.10166/6 [======
Epoch 88/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0868 - mean_squared_error: 0.08686/6 [======
Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1023 - mean_squared_error: 0.10236/6 [======
Epoch 90/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0849 - mean_squared_error: 0.08496/6 [======
Epoch 91/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1138 - mean_squared_error: 0.11386/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0482 - mean_squared_error: 0.04826/6 [======
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0594 - mean_squared_error: 0.05946/6 [======
Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1025 - mean_squared_error: 0.10256/6 [======
Epoch 95/150
```

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1/6 [====>.........................] - ETA: 0s - loss: 0.0913 - mean_squared_error: 0.09136/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0421 - mean_squared_error: 0.04216/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0893 - mean_squared_error: 0.08936/6 [======
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0721 - mean_squared_error: 0.07216/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0876 - mean_squared_error: 0.08766/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0957 - mean_squared_error: 0.09576/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0603 - mean_squared_error: 0.06036/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0963 - mean_squared_error: 0.09636/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0772 - mean_squared_error: 0.07726/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0720 - mean_squared_error: 0.07206/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1064 - mean_squared_error: 0.10646/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0596 - mean_squared_error: 0.05966/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0492 - mean_squared_error: 0.04926/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0766 - mean_squared_error: 0.07666/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0738 - mean_squared_error: 0.07386/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0745 - mean_squared_error: 0.07456/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0559 - mean_squared_error: 0.05596/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0584 - mean_squared_error: 0.05846/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0609 - mean_squared_error: 0.06096/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0876 - mean_squared_error: 0.08766/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0365 - mean_squared_error: 0.03656/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0808 - mean_squared_error: 0.08086/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0821 - mean_squared_error: 0.08216/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0848 - mean_squared_error: 0.08486/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0650 - mean_squared_error: 0.06506/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0526 - mean_squared_error: 0.05266/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1006 - mean_squared_error: 0.10066/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0616 - mean_squared_error: 0.06166/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0369 - mean_squared_error: 0.03696/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0989 - mean_squared_error: 0.09896/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0960 - mean_squared_error: 0.09606/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0398 - mean_squared_error: 0.03986/6 [======
Epoch 127/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0434 - mean_squared_error: 0.04346/6 [======
Epoch 128/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0905 - mean_squared_error: 0.09056/6 [======
Epoch 129/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0918 - mean_squared_error: 0.09186/6 [======
Epoch 130/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0744 - mean_squared_error: 0.07446/6 [======
```

```
Epoch 131/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0697 - mean_squared_error: 0.06976/6 [======
Epoch 132/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0407 - mean_squared_error: 0.04076/6 [======
Epoch 133/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0379 - mean_squared_error: 0.03796/6 [======
Epoch 134/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0692 - mean_squared_error: 0.06926/6 [======
Epoch 135/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0848 - mean_squared_error: 0.08486/6 [======
Epoch 136/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0589 - mean_squared_error: 0.05896/6 [======
Epoch 137/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0853 - mean_squared_error: 0.08536/6 [======
Epoch 138/150
1/6 [====>.......................] - ETA: 0s - loss: 0.1004 - mean_squared_error: 0.10046/6 [======
Epoch 139/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0355 - mean_squared_error: 0.03556/6 [======
Epoch 140/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0762 - mean_squared_error: 0.07626/6 [======
Epoch 141/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0674 - mean_squared_error: 0.06746/6 [======
Epoch 142/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0711 - mean_squared_error: 0.07116/6 [======
Epoch 143/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0555 - mean_squared_error: 0.05556/6 [======
Epoch 144/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0865 - mean_squared_error: 0.08656/6 [======
Epoch 145/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0400 - mean_squared_error: 0.04006/6 [======
Epoch 146/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0410 - mean_squared_error: 0.04106/6 [======
Epoch 147/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0515 - mean_squared_error: 0.05156/6 [======
Epoch 148/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0691 - mean_squared_error: 0.06916/6 [======
Epoch 149/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0634 - mean_squared_error: 0.06346/6 [======
Epoch 150/150
1/6 [====>.......................] - ETA: 0s - loss: 0.0632 - mean_squared_error: 0.06326/6 [======


MSE on Train Set for Training Model # 46  =  0.07947306121694048

MSE on Test Set for Training Model # 46  =  0.11321382680768452
```

	precision	recall	f1-score	support
0	0.76	0.88	0.81	25
1	0.91	0.81	0.85	36
accuracy			0.84	61
macro avg	0.83	0.84	0.83	61
weighted avg	0.85	0.84	0.84	61

```
Training Model #  47


Epoch 1/150
1/6 [====>.......................] - ETA: 0s - loss: 0.2350 - mean_squared_error: 0.23506/6 [======
Epoch 2/150
1/6 [====>.......................] - ETA: 0s - loss: 0.2467 - mean_squared_error: 0.24676/6 [======
Epoch 3/150
1/6 [====>.......................] - ETA: 0s - loss: 0.2275 - mean_squared_error: 0.22756/6 [======
Epoch 4/150
1/6 [====>.......................] - ETA: 0s - loss: 0.2127 - mean_squared_error: 0.21276/6 [======
Epoch 5/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.1918 - mean_squared_error: 0.19186/6 [======
Epoch 6/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1940 - mean_squared_error: 0.19406/6 [======
Epoch 7/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1963 - mean_squared_error: 0.19636/6 [======
Epoch 8/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2005 - mean_squared_error: 0.20056/6 [======
Epoch 9/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2005 - mean_squared_error: 0.20056/6 [======
Epoch 10/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2028 - mean_squared_error: 0.20286/6 [======
Epoch 11/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1622 - mean_squared_error: 0.16226/6 [======
Epoch 12/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2167 - mean_squared_error: 0.21676/6 [======
Epoch 13/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1815 - mean_squared_error: 0.18156/6 [======
Epoch 14/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1790 - mean_squared_error: 0.17906/6 [======
Epoch 15/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1404 - mean_squared_error: 0.14046/6 [======
Epoch 16/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1534 - mean_squared_error: 0.15346/6 [======
Epoch 17/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1951 - mean_squared_error: 0.19516/6 [======
Epoch 18/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1785 - mean_squared_error: 0.17856/6 [======
Epoch 19/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1562 - mean_squared_error: 0.15626/6 [======
Epoch 20/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1342 - mean_squared_error: 0.13426/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1660 - mean_squared_error: 0.16606/6 [======
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1784 - mean_squared_error: 0.17846/6 [======
Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1829 - mean_squared_error: 0.18296/6 [======
Epoch 24/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1608 - mean_squared_error: 0.16086/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1521 - mean_squared_error: 0.15216/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1229 - mean_squared_error: 0.12296/6 [======
Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1057 - mean_squared_error: 0.10576/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1112 - mean_squared_error: 0.11126/6 [======
Epoch 29/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1303 - mean_squared_error: 0.13036/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1312 - mean_squared_error: 0.13126/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1088 - mean_squared_error: 0.10886/6 [======
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1437 - mean_squared_error: 0.14376/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1446 - mean_squared_error: 0.14466/6 [======
Epoch 34/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1582 - mean_squared_error: 0.15826/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1371 - mean_squared_error: 0.13716/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1232 - mean_squared_error: 0.12326/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1506 - mean_squared_error: 0.15066/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1378 - mean_squared_error: 0.13786/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1209 - mean_squared_error: 0.12096/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0965 - mean_squared_error: 0.09656/6 [======
```

```
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1025 - mean_squared_error: 0.10256/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1313 - mean_squared_error: 0.13136/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0999 - mean_squared_error: 0.09996/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1022 - mean_squared_error: 0.10226/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1072 - mean_squared_error: 0.10726/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1370 - mean_squared_error: 0.13706/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1227 - mean_squared_error: 0.12276/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1282 - mean_squared_error: 0.12826/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1645 - mean_squared_error: 0.16456/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0966 - mean_squared_error: 0.09666/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1284 - mean_squared_error: 0.12846/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0821 - mean_squared_error: 0.08216/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1432 - mean_squared_error: 0.14326/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1445 - mean_squared_error: 0.14456/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1277 - mean_squared_error: 0.12776/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0919 - mean_squared_error: 0.09196/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0876 - mean_squared_error: 0.08766/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0994 - mean_squared_error: 0.09946/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1031 - mean_squared_error: 0.10316/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1251 - mean_squared_error: 0.12516/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0754 - mean_squared_error: 0.07546/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0758 - mean_squared_error: 0.07586/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1266 - mean_squared_error: 0.12666/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0886 - mean_squared_error: 0.08866/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0798 - mean_squared_error: 0.07986/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1003 - mean_squared_error: 0.10036/6 [======
Epoch 67/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1261 - mean_squared_error: 0.12616/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0845 - mean_squared_error: 0.08456/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1355 - mean_squared_error: 0.13556/6 [======
Epoch 70/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0935 - mean_squared_error: 0.09356/6 [======
Epoch 71/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1197 - mean_squared_error: 0.11976/6 [======
Epoch 72/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0822 - mean_squared_error: 0.08226/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0870 - mean_squared_error: 0.08706/6 [======
Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1355 - mean_squared_error: 0.13556/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0649 - mean_squared_error: 0.06496/6 [======
Epoch 76/150
```

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1/6 [====>........................] - ETA: 0s - loss: 0.0985 - mean_squared_error: 0.09856/6 [======
Epoch 77/150
1/6 [====>........................] - ETA: 0s - loss: 0.1454 - mean_squared_error: 0.14546/6 [======
Epoch 78/150
1/6 [====>........................] - ETA: 0s - loss: 0.1297 - mean_squared_error: 0.12976/6 [======
Epoch 79/150
1/6 [====>........................] - ETA: 0s - loss: 0.0540 - mean_squared_error: 0.05406/6 [======
Epoch 80/150
1/6 [====>........................] - ETA: 0s - loss: 0.1026 - mean_squared_error: 0.10266/6 [======
Epoch 81/150
1/6 [====>........................] - ETA: 0s - loss: 0.0996 - mean_squared_error: 0.09966/6 [======
Epoch 82/150
1/6 [====>........................] - ETA: 0s - loss: 0.0836 - mean_squared_error: 0.08366/6 [======
Epoch 83/150
1/6 [====>........................] - ETA: 0s - loss: 0.1223 - mean_squared_error: 0.12236/6 [======
Epoch 84/150
1/6 [====>........................] - ETA: 0s - loss: 0.0996 - mean_squared_error: 0.09966/6 [======
Epoch 85/150
1/6 [====>........................] - ETA: 0s - loss: 0.0455 - mean_squared_error: 0.04556/6 [======
Epoch 86/150
1/6 [====>........................] - ETA: 0s - loss: 0.1265 - mean_squared_error: 0.12656/6 [======
Epoch 87/150
1/6 [====>........................] - ETA: 0s - loss: 0.1339 - mean_squared_error: 0.13396/6 [======
Epoch 88/150
1/6 [====>........................] - ETA: 0s - loss: 0.0481 - mean_squared_error: 0.04816/6 [======
Epoch 89/150
1/6 [====>........................] - ETA: 0s - loss: 0.0797 - mean_squared_error: 0.07976/6 [======
Epoch 90/150
1/6 [====>........................] - ETA: 0s - loss: 0.1002 - mean_squared_error: 0.10026/6 [======
Epoch 91/150
1/6 [====>........................] - ETA: 0s - loss: 0.1122 - mean_squared_error: 0.11226/6 [======
Epoch 92/150
1/6 [====>........................] - ETA: 0s - loss: 0.0969 - mean_squared_error: 0.09696/6 [======
Epoch 93/150
1/6 [====>........................] - ETA: 0s - loss: 0.0615 - mean_squared_error: 0.06156/6 [======
Epoch 94/150
1/6 [====>........................] - ETA: 0s - loss: 0.0634 - mean_squared_error: 0.06346/6 [======
Epoch 95/150
1/6 [====>........................] - ETA: 0s - loss: 0.1027 - mean_squared_error: 0.10276/6 [======
Epoch 96/150
1/6 [====>........................] - ETA: 0s - loss: 0.0939 - mean_squared_error: 0.09396/6 [======
Epoch 97/150
1/6 [====>........................] - ETA: 0s - loss: 0.0435 - mean_squared_error: 0.04356/6 [======
Epoch 98/150
1/6 [====>........................] - ETA: 0s - loss: 0.0537 - mean_squared_error: 0.05376/6 [======
Epoch 99/150
1/6 [====>........................] - ETA: 0s - loss: 0.0733 - mean_squared_error: 0.07336/6 [======
Epoch 100/150
1/6 [====>........................] - ETA: 0s - loss: 0.0899 - mean_squared_error: 0.08996/6 [======
Epoch 101/150
1/6 [====>........................] - ETA: 0s - loss: 0.0891 - mean_squared_error: 0.08916/6 [======
Epoch 102/150
1/6 [====>........................] - ETA: 0s - loss: 0.0611 - mean_squared_error: 0.06116/6 [======
Epoch 103/150
1/6 [====>........................] - ETA: 0s - loss: 0.0656 - mean_squared_error: 0.06566/6 [======
Epoch 104/150
1/6 [====>........................] - ETA: 0s - loss: 0.1042 - mean_squared_error: 0.10426/6 [======
Epoch 105/150
1/6 [====>........................] - ETA: 0s - loss: 0.0806 - mean_squared_error: 0.08066/6 [======
Epoch 106/150
1/6 [====>........................] - ETA: 0s - loss: 0.0955 - mean_squared_error: 0.09556/6 [======
Epoch 107/150
1/6 [====>........................] - ETA: 0s - loss: 0.0430 - mean_squared_error: 0.04306/6 [======
Epoch 108/150
1/6 [====>........................] - ETA: 0s - loss: 0.0936 - mean_squared_error: 0.09366/6 [======
Epoch 109/150
1/6 [====>........................] - ETA: 0s - loss: 0.1012 - mean_squared_error: 0.10126/6 [======
Epoch 110/150
1/6 [====>........................] - ETA: 0s - loss: 0.0730 - mean_squared_error: 0.07306/6 [======
Epoch 111/150
1/6 [====>........................] - ETA: 0s - loss: 0.0838 - mean_squared_error: 0.08386/6 [======
```

```
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1050 - mean_squared_error: 0.10506/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0533 - mean_squared_error: 0.05336/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0755 - mean_squared_error: 0.07556/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0950 - mean_squared_error: 0.09506/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0444 - mean_squared_error: 0.04446/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0466 - mean_squared_error: 0.04666/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0903 - mean_squared_error: 0.09036/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0725 - mean_squared_error: 0.07256/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1005 - mean_squared_error: 0.10056/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0602 - mean_squared_error: 0.06026/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0611 - mean_squared_error: 0.06116/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0986 - mean_squared_error: 0.09866/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0785 - mean_squared_error: 0.07856/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0882 - mean_squared_error: 0.08826/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0905 - mean_squared_error: 0.09056/6 [======
Epoch 127/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0642 - mean_squared_error: 0.06426/6 [======
Epoch 128/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0272 - mean_squared_error: 0.02726/6 [======
Epoch 129/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0654 - mean_squared_error: 0.06546/6 [======
Epoch 130/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0805 - mean_squared_error: 0.08056/6 [======
Epoch 131/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0802 - mean_squared_error: 0.08026/6 [======
Epoch 132/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1004 - mean_squared_error: 0.10046/6 [======
Epoch 133/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0535 - mean_squared_error: 0.05356/6 [======
Epoch 134/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0239 - mean_squared_error: 0.02396/6 [======
Epoch 135/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0299 - mean_squared_error: 0.02996/6 [======
Epoch 136/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0321 - mean_squared_error: 0.03216/6 [======
Epoch 137/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0372 - mean_squared_error: 0.03726/6 [======
Epoch 138/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0607 - mean_squared_error: 0.06076/6 [======
Epoch 139/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0634 - mean_squared_error: 0.06346/6 [======
Epoch 140/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0415 - mean_squared_error: 0.04156/6 [======
Epoch 141/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0601 - mean_squared_error: 0.06016/6 [======
Epoch 142/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0971 - mean_squared_error: 0.09716/6 [======
Epoch 143/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0425 - mean_squared_error: 0.04256/6 [======
Epoch 144/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0221 - mean_squared_error: 0.02216/6 [======
Epoch 145/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0732 - mean_squared_error: 0.07326/6 [======
Epoch 146/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0768 - mean_squared_error: 0.07686/6 [======
Epoch 147/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.0923 - mean_squared_error: 0.09236/6 [======
Epoch 148/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0535 - mean_squared_error: 0.05356/6 [======
Epoch 149/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0573 - mean_squared_error: 0.05736/6 [======
Epoch 150/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0539 - mean_squared_error: 0.05396/6 [======
```

```
MSE on Train Set for Training Model # 47  =  0.07862443020951239

MSE on Test Set for Training Model # 47  =  0.0839355682129962
```

```
              precision    recall  f1-score   support

           0       0.80      0.96      0.87        25
           1       0.97      0.83      0.90        36

    accuracy                           0.89        61
   macro avg       0.88      0.90      0.88        61
weighted avg       0.90      0.89      0.89        61
```

```
Training Model #  48


Epoch 1/150
1/6 [====>.........................] - ETA: 0s - loss: 0.3501 - mean_squared_error: 0.35016/6 [======
Epoch 2/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2379 - mean_squared_error: 0.23796/6 [======
Epoch 3/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2889 - mean_squared_error: 0.28896/6 [======
Epoch 4/150
1/6 [====>.........................] - ETA: 0s - loss: 0.3357 - mean_squared_error: 0.33576/6 [======
Epoch 5/150
1/6 [====>.........................] - ETA: 0s - loss: 0.3111 - mean_squared_error: 0.31116/6 [======
Epoch 6/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2815 - mean_squared_error: 0.28156/6 [======
Epoch 7/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2889 - mean_squared_error: 0.28896/6 [======
Epoch 8/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2601 - mean_squared_error: 0.26016/6 [======
Epoch 9/150
1/6 [====>.........................] - ETA: 0s - loss: 0.3000 - mean_squared_error: 0.30006/6 [======
Epoch 10/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2834 - mean_squared_error: 0.28346/6 [======
Epoch 11/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2650 - mean_squared_error: 0.26506/6 [======
Epoch 12/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2563 - mean_squared_error: 0.25636/6 [======
Epoch 13/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2720 - mean_squared_error: 0.27206/6 [======
Epoch 14/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2301 - mean_squared_error: 0.23016/6 [======
Epoch 15/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2436 - mean_squared_error: 0.24366/6 [======
Epoch 16/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2262 - mean_squared_error: 0.22626/6 [======
Epoch 17/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2049 - mean_squared_error: 0.20496/6 [======
Epoch 18/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2148 - mean_squared_error: 0.21486/6 [======
Epoch 19/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2266 - mean_squared_error: 0.22666/6 [======
Epoch 20/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2180 - mean_squared_error: 0.21806/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2017 - mean_squared_error: 0.20176/6 [======
```

```
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2528 - mean_squared_error: 0.25286/6 [======
Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2041 - mean_squared_error: 0.20416/6 [======
Epoch 24/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2314 - mean_squared_error: 0.23146/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1864 - mean_squared_error: 0.18646/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1754 - mean_squared_error: 0.17546/6 [======
Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2008 - mean_squared_error: 0.20086/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1992 - mean_squared_error: 0.19926/6 [======
Epoch 29/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1649 - mean_squared_error: 0.16496/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1735 - mean_squared_error: 0.17356/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1721 - mean_squared_error: 0.17216/6 [======
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2076 - mean_squared_error: 0.20766/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1663 - mean_squared_error: 0.16636/6 [======
Epoch 34/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1653 - mean_squared_error: 0.16536/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1559 - mean_squared_error: 0.15596/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2095 - mean_squared_error: 0.20956/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1998 - mean_squared_error: 0.19986/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1794 - mean_squared_error: 0.17946/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1547 - mean_squared_error: 0.15476/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1228 - mean_squared_error: 0.12286/6 [======
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1432 - mean_squared_error: 0.14326/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1332 - mean_squared_error: 0.13326/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1470 - mean_squared_error: 0.14706/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2040 - mean_squared_error: 0.20406/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1140 - mean_squared_error: 0.11406/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1253 - mean_squared_error: 0.12536/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1762 - mean_squared_error: 0.17626/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1092 - mean_squared_error: 0.10926/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1491 - mean_squared_error: 0.14916/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1421 - mean_squared_error: 0.14216/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1510 - mean_squared_error: 0.15106/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0985 - mean_squared_error: 0.09856/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1216 - mean_squared_error: 0.12166/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1292 - mean_squared_error: 0.12926/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1219 - mean_squared_error: 0.12196/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1102 - mean_squared_error: 0.11026/6 [======
Epoch 57/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.1362 - mean_squared_error: 0.13626/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1231 - mean_squared_error: 0.12316/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1418 - mean_squared_error: 0.14186/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1075 - mean_squared_error: 0.10756/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1230 - mean_squared_error: 0.12306/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1988 - mean_squared_error: 0.19886/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1430 - mean_squared_error: 0.14306/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1347 - mean_squared_error: 0.13476/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1222 - mean_squared_error: 0.12226/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1016 - mean_squared_error: 0.10166/6 [======
Epoch 67/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1551 - mean_squared_error: 0.15516/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1405 - mean_squared_error: 0.14056/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0847 - mean_squared_error: 0.08476/6 [======
Epoch 70/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1210 - mean_squared_error: 0.12106/6 [======
Epoch 71/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0867 - mean_squared_error: 0.08676/6 [======
Epoch 72/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0745 - mean_squared_error: 0.07456/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1182 - mean_squared_error: 0.11826/6 [======
Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0582 - mean_squared_error: 0.05826/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1402 - mean_squared_error: 0.14026/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1095 - mean_squared_error: 0.10956/6 [======
Epoch 77/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1163 - mean_squared_error: 0.11636/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1124 - mean_squared_error: 0.11246/6 [======
Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1148 - mean_squared_error: 0.11486/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0761 - mean_squared_error: 0.07616/6 [======
Epoch 81/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1091 - mean_squared_error: 0.10916/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0981 - mean_squared_error: 0.09816/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0877 - mean_squared_error: 0.08776/6 [======
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1358 - mean_squared_error: 0.13586/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1021 - mean_squared_error: 0.10216/6 [======
Epoch 86/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1013 - mean_squared_error: 0.10136/6 [======
Epoch 87/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0705 - mean_squared_error: 0.07056/6 [======
Epoch 88/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0532 - mean_squared_error: 0.05326/6 [======
Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1277 - mean_squared_error: 0.12776/6 [======
Epoch 90/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0833 - mean_squared_error: 0.08336/6 [======
Epoch 91/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1028 - mean_squared_error: 0.10286/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0833 - mean_squared_error: 0.08336/6 [======
```

```
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0948 - mean_squared_error: 0.09486/6 [======
Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0954 - mean_squared_error: 0.09546/6 [======
Epoch 95/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1070 - mean_squared_error: 0.10706/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0999 - mean_squared_error: 0.09996/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0397 - mean_squared_error: 0.03976/6 [======
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1270 - mean_squared_error: 0.12706/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0848 - mean_squared_error: 0.08486/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1018 - mean_squared_error: 0.10186/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0880 - mean_squared_error: 0.08806/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0777 - mean_squared_error: 0.07776/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0961 - mean_squared_error: 0.09616/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0665 - mean_squared_error: 0.06656/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0638 - mean_squared_error: 0.06386/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0538 - mean_squared_error: 0.05386/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0870 - mean_squared_error: 0.08706/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0641 - mean_squared_error: 0.06416/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0412 - mean_squared_error: 0.04126/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0846 - mean_squared_error: 0.08466/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0713 - mean_squared_error: 0.07136/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0635 - mean_squared_error: 0.06356/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1383 - mean_squared_error: 0.13836/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0908 - mean_squared_error: 0.09086/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0879 - mean_squared_error: 0.08796/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0515 - mean_squared_error: 0.05156/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0989 - mean_squared_error: 0.09896/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0710 - mean_squared_error: 0.07106/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0825 - mean_squared_error: 0.08256/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0621 - mean_squared_error: 0.06216/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0878 - mean_squared_error: 0.08786/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0422 - mean_squared_error: 0.04226/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1014 - mean_squared_error: 0.10146/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0845 - mean_squared_error: 0.08456/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0882 - mean_squared_error: 0.08826/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1144 - mean_squared_error: 0.11446/6 [======
Epoch 127/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1303 - mean_squared_error: 0.13036/6 [======
Epoch 128/150
```

```
1/6 [===>........................] – ETA: 0s – loss: 0.0329 – mean_squared_error: 0.03296/6 [======
Epoch 129/150
1/6 [===>........................] – ETA: 0s – loss: 0.0487 – mean_squared_error: 0.04876/6 [======
Epoch 130/150
1/6 [===>........................] – ETA: 0s – loss: 0.0933 – mean_squared_error: 0.09336/6 [======
Epoch 131/150
1/6 [===>........................] – ETA: 0s – loss: 0.0648 – mean_squared_error: 0.06486/6 [======
Epoch 132/150
1/6 [===>........................] – ETA: 0s – loss: 0.0742 – mean_squared_error: 0.07426/6 [======
Epoch 133/150
1/6 [===>........................] – ETA: 0s – loss: 0.1271 – mean_squared_error: 0.12716/6 [======
Epoch 134/150
1/6 [===>........................] – ETA: 0s – loss: 0.0734 – mean_squared_error: 0.07346/6 [======
Epoch 135/150
1/6 [===>........................] – ETA: 0s – loss: 0.0876 – mean_squared_error: 0.08766/6 [======
Epoch 136/150
1/6 [===>........................] – ETA: 0s – loss: 0.0517 – mean_squared_error: 0.05176/6 [======
Epoch 137/150
1/6 [===>........................] – ETA: 0s – loss: 0.0895 – mean_squared_error: 0.08956/6 [======
Epoch 138/150
1/6 [===>........................] – ETA: 0s – loss: 0.0838 – mean_squared_error: 0.08386/6 [======
Epoch 139/150
1/6 [===>........................] – ETA: 0s – loss: 0.0776 – mean_squared_error: 0.07766/6 [======
Epoch 140/150
1/6 [===>........................] – ETA: 0s – loss: 0.0789 – mean_squared_error: 0.07896/6 [======
Epoch 141/150
1/6 [===>........................] – ETA: 0s – loss: 0.1023 – mean_squared_error: 0.10236/6 [======
Epoch 142/150
1/6 [===>........................] – ETA: 0s – loss: 0.1240 – mean_squared_error: 0.12406/6 [======
Epoch 143/150
1/6 [===>........................] – ETA: 0s – loss: 0.1227 – mean_squared_error: 0.12276/6 [======
Epoch 144/150
1/6 [===>........................] – ETA: 0s – loss: 0.0926 – mean_squared_error: 0.09266/6 [======
Epoch 145/150
1/6 [===>........................] – ETA: 0s – loss: 0.0411 – mean_squared_error: 0.04116/6 [======
Epoch 146/150
1/6 [===>........................] – ETA: 0s – loss: 0.0640 – mean_squared_error: 0.06406/6 [======
Epoch 147/150
1/6 [===>........................] – ETA: 0s – loss: 0.0501 – mean_squared_error: 0.05016/6 [======
Epoch 148/150
1/6 [===>........................] – ETA: 0s – loss: 0.0870 – mean_squared_error: 0.08706/6 [======
Epoch 149/150
1/6 [===>........................] – ETA: 0s – loss: 0.0728 – mean_squared_error: 0.07286/6 [======
Epoch 150/150
1/6 [===>........................] – ETA: 0s – loss: 0.0881 – mean_squared_error: 0.08816/6 [======
```

```
MSE on Train Set for Training Model # 48  =  0.07596450097219055

MSE on Test Set for Training Model # 48  =  0.09257150788810178
```

	precision	recall	f1-score	support
0	0.85	0.88	0.86	25
1	0.91	0.89	0.90	36
accuracy			0.89	61
macro avg	0.88	0.88	0.88	61
weighted avg	0.89	0.89	0.89	61

```
Training Model #  49


Epoch 1/150
1/6 [===>........................] – ETA: 0s – loss: 0.3084 – mean_squared_error: 0.30846/6 [======
Epoch 2/150
1/6 [===>........................] – ETA: 0s – loss: 0.2608 – mean_squared_error: 0.26086/6 [======
```

```
Epoch 3/150
1/6 [====>........................] - ETA: 0s - loss: 0.2294 - mean_squared_error: 0.22946/6 [======
Epoch 4/150
1/6 [====>........................] - ETA: 0s - loss: 0.3010 - mean_squared_error: 0.30106/6 [======
Epoch 5/150
1/6 [====>........................] - ETA: 0s - loss: 0.2452 - mean_squared_error: 0.24526/6 [======
Epoch 6/150
1/6 [====>........................] - ETA: 0s - loss: 0.2176 - mean_squared_error: 0.21766/6 [======
Epoch 7/150
1/6 [====>........................] - ETA: 0s - loss: 0.2133 - mean_squared_error: 0.21336/6 [======
Epoch 8/150
1/6 [====>........................] - ETA: 0s - loss: 0.2336 - mean_squared_error: 0.23366/6 [======
Epoch 9/150
1/6 [====>........................] - ETA: 0s - loss: 0.2445 - mean_squared_error: 0.24456/6 [======
Epoch 10/150
1/6 [====>........................] - ETA: 0s - loss: 0.2015 - mean_squared_error: 0.20156/6 [======
Epoch 11/150
1/6 [====>........................] - ETA: 0s - loss: 0.1968 - mean_squared_error: 0.19686/6 [======
Epoch 12/150
1/6 [====>........................] - ETA: 0s - loss: 0.1748 - mean_squared_error: 0.17486/6 [======
Epoch 13/150
1/6 [====>........................] - ETA: 0s - loss: 0.1732 - mean_squared_error: 0.17326/6 [======
Epoch 14/150
1/6 [====>........................] - ETA: 0s - loss: 0.1830 - mean_squared_error: 0.18306/6 [======
Epoch 15/150
1/6 [====>........................] - ETA: 0s - loss: 0.1560 - mean_squared_error: 0.15606/6 [======
Epoch 16/150
1/6 [====>........................] - ETA: 0s - loss: 0.1859 - mean_squared_error: 0.18596/6 [======
Epoch 17/150
1/6 [====>........................] - ETA: 0s - loss: 0.1974 - mean_squared_error: 0.19746/6 [======
Epoch 18/150
1/6 [====>........................] - ETA: 0s - loss: 0.1848 - mean_squared_error: 0.18486/6 [======
Epoch 19/150
1/6 [====>........................] - ETA: 0s - loss: 0.1570 - mean_squared_error: 0.15706/6 [======
Epoch 20/150
1/6 [====>........................] - ETA: 0s - loss: 0.1951 - mean_squared_error: 0.19516/6 [======
Epoch 21/150
1/6 [====>........................] - ETA: 0s - loss: 0.1307 - mean_squared_error: 0.13076/6 [======
Epoch 22/150
1/6 [====>........................] - ETA: 0s - loss: 0.1487 - mean_squared_error: 0.14876/6 [======
Epoch 23/150
1/6 [====>........................] - ETA: 0s - loss: 0.1423 - mean_squared_error: 0.14236/6 [======
Epoch 24/150
1/6 [====>........................] - ETA: 0s - loss: 0.1662 - mean_squared_error: 0.16626/6 [======
Epoch 25/150
1/6 [====>........................] - ETA: 0s - loss: 0.1616 - mean_squared_error: 0.16166/6 [======
Epoch 26/150
1/6 [====>........................] - ETA: 0s - loss: 0.1437 - mean_squared_error: 0.14376/6 [======
Epoch 27/150
1/6 [====>........................] - ETA: 0s - loss: 0.1544 - mean_squared_error: 0.15446/6 [======
Epoch 28/150
1/6 [====>........................] - ETA: 0s - loss: 0.1463 - mean_squared_error: 0.14636/6 [======
Epoch 29/150
1/6 [====>........................] - ETA: 0s - loss: 0.1592 - mean_squared_error: 0.15926/6 [======
Epoch 30/150
1/6 [====>........................] - ETA: 0s - loss: 0.1331 - mean_squared_error: 0.13316/6 [======
Epoch 31/150
1/6 [====>........................] - ETA: 0s - loss: 0.1157 - mean_squared_error: 0.11576/6 [======
Epoch 32/150
1/6 [====>........................] - ETA: 0s - loss: 0.1059 - mean_squared_error: 0.10596/6 [======
Epoch 33/150
1/6 [====>........................] - ETA: 0s - loss: 0.0910 - mean_squared_error: 0.09106/6 [======
Epoch 34/150
1/6 [====>........................] - ETA: 0s - loss: 0.1289 - mean_squared_error: 0.12896/6 [======
Epoch 35/150
1/6 [====>........................] - ETA: 0s - loss: 0.1642 - mean_squared_error: 0.16426/6 [======
Epoch 36/150
1/6 [====>........................] - ETA: 0s - loss: 0.1267 - mean_squared_error: 0.12676/6 [======
Epoch 37/150
1/6 [====>........................] - ETA: 0s - loss: 0.1351 - mean_squared_error: 0.13516/6 [======
Epoch 38/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.1123 - mean_squared_error: 0.11236/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1288 - mean_squared_error: 0.12886/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0799 - mean_squared_error: 0.07996/6 [======
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1082 - mean_squared_error: 0.10826/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1296 - mean_squared_error: 0.12966/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1080 - mean_squared_error: 0.10806/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0875 - mean_squared_error: 0.08756/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1059 - mean_squared_error: 0.10596/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1210 - mean_squared_error: 0.12106/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1079 - mean_squared_error: 0.10796/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1053 - mean_squared_error: 0.10536/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1392 - mean_squared_error: 0.13926/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1014 - mean_squared_error: 0.10146/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1310 - mean_squared_error: 0.13106/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1481 - mean_squared_error: 0.14816/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1514 - mean_squared_error: 0.15146/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0538 - mean_squared_error: 0.05386/6 [======
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0829 - mean_squared_error: 0.08296/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0993 - mean_squared_error: 0.09936/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1175 - mean_squared_error: 0.11756/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0736 - mean_squared_error: 0.07366/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0792 - mean_squared_error: 0.07926/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0973 - mean_squared_error: 0.09736/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0825 - mean_squared_error: 0.08256/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0721 - mean_squared_error: 0.07216/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0977 - mean_squared_error: 0.09776/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1587 - mean_squared_error: 0.15876/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0977 - mean_squared_error: 0.09776/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0981 - mean_squared_error: 0.09816/6 [======
Epoch 67/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0564 - mean_squared_error: 0.05646/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1267 - mean_squared_error: 0.12676/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1332 - mean_squared_error: 0.13326/6 [======
Epoch 70/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0747 - mean_squared_error: 0.07476/6 [======
Epoch 71/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0680 - mean_squared_error: 0.06806/6 [======
Epoch 72/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1033 - mean_squared_error: 0.10336/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0992 - mean_squared_error: 0.09926/6 [======
```

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Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0840 - mean_squared_error: 0.08406/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1126 - mean_squared_error: 0.11266/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0582 - mean_squared_error: 0.05826/6 [======
Epoch 77/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0515 - mean_squared_error: 0.05156/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0675 - mean_squared_error: 0.06756/6 [======
Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1428 - mean_squared_error: 0.14286/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0561 - mean_squared_error: 0.05616/6 [======
Epoch 81/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0795 - mean_squared_error: 0.07956/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1119 - mean_squared_error: 0.11196/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1091 - mean_squared_error: 0.10916/6 [======
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0356 - mean_squared_error: 0.03566/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0797 - mean_squared_error: 0.07976/6 [======
Epoch 86/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0903 - mean_squared_error: 0.09036/6 [======
Epoch 87/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0812 - mean_squared_error: 0.08126/6 [======
Epoch 88/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0853 - mean_squared_error: 0.08536/6 [======
Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0451 - mean_squared_error: 0.04516/6 [======
Epoch 90/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0863 - mean_squared_error: 0.08636/6 [======
Epoch 91/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1032 - mean_squared_error: 0.10326/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0711 - mean_squared_error: 0.07116/6 [======
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0867 - mean_squared_error: 0.08676/6 [======
Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0680 - mean_squared_error: 0.06806/6 [======
Epoch 95/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1259 - mean_squared_error: 0.12596/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0861 - mean_squared_error: 0.08616/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0772 - mean_squared_error: 0.07726/6 [======
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0590 - mean_squared_error: 0.05906/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0544 - mean_squared_error: 0.05446/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0590 - mean_squared_error: 0.05906/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0677 - mean_squared_error: 0.06776/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0897 - mean_squared_error: 0.08976/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0920 - mean_squared_error: 0.09206/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0825 - mean_squared_error: 0.08256/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0885 - mean_squared_error: 0.08856/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0880 - mean_squared_error: 0.08806/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0664 - mean_squared_error: 0.06646/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0400 - mean_squared_error: 0.04006/6 [======
Epoch 109/150
```

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1/6 [====>.........................] - ETA: 0s - loss: 0.1341 - mean_squared_error: 0.13416/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0947 - mean_squared_error: 0.09476/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0577 - mean_squared_error: 0.05776/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0423 - mean_squared_error: 0.04236/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0379 - mean_squared_error: 0.03796/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0433 - mean_squared_error: 0.04336/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0931 - mean_squared_error: 0.09316/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1077 - mean_squared_error: 0.10776/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0559 - mean_squared_error: 0.05596/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0987 - mean_squared_error: 0.09876/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0868 - mean_squared_error: 0.08686/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0623 - mean_squared_error: 0.06236/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0326 - mean_squared_error: 0.03266/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0448 - mean_squared_error: 0.04486/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0877 - mean_squared_error: 0.08776/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0394 - mean_squared_error: 0.03946/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0388 - mean_squared_error: 0.03886/6 [======
Epoch 126/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0782 - mean_squared_error: 0.07826/6 [======
Epoch 127/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0368 - mean_squared_error: 0.03686/6 [======
Epoch 128/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0456 - mean_squared_error: 0.04566/6 [======
Epoch 129/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0904 - mean_squared_error: 0.09046/6 [======
Epoch 130/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1073 - mean_squared_error: 0.10736/6 [======
Epoch 131/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0785 - mean_squared_error: 0.07856/6 [======
Epoch 132/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0529 - mean_squared_error: 0.05296/6 [======
Epoch 133/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0724 - mean_squared_error: 0.07246/6 [======
Epoch 134/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0644 - mean_squared_error: 0.06446/6 [======
Epoch 135/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0650 - mean_squared_error: 0.06506/6 [======
Epoch 136/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0580 - mean_squared_error: 0.05806/6 [======
Epoch 137/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0450 - mean_squared_error: 0.04506/6 [======
Epoch 138/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0399 - mean_squared_error: 0.03996/6 [======
Epoch 139/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0473 - mean_squared_error: 0.04736/6 [======
Epoch 140/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0770 - mean_squared_error: 0.07706/6 [======
Epoch 141/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1132 - mean_squared_error: 0.11326/6 [======
Epoch 142/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0567 - mean_squared_error: 0.05676/6 [======
Epoch 143/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0344 - mean_squared_error: 0.03446/6 [======
Epoch 144/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1059 - mean_squared_error: 0.10596/6 [======
```

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Epoch 145/150
1/6 [====>........................] - ETA: 0s - loss: 0.0453 - mean_squared_error: 0.04536/6 [======
Epoch 146/150
1/6 [====>........................] - ETA: 0s - loss: 0.1113 - mean_squared_error: 0.11136/6 [======
Epoch 147/150
1/6 [====>........................] - ETA: 0s - loss: 0.0466 - mean_squared_error: 0.04666/6 [======
Epoch 148/150
1/6 [====>........................] - ETA: 0s - loss: 0.0343 - mean_squared_error: 0.03436/6 [======
Epoch 149/150
1/6 [====>........................] - ETA: 0s - loss: 0.0475 - mean_squared_error: 0.04756/6 [======
Epoch 150/150
1/6 [====>........................] - ETA: 0s - loss: 0.0237 - mean_squared_error: 0.02376/6 [======


MSE on Train Set for Training Model # 49  =  0.08745202689616606

MSE on Test Set for Training Model # 49  =  0.07202152920508598

             precision    recall  f1-score   support

          0       0.82      0.92      0.87        25
          1       0.94      0.86      0.90        36

   accuracy                           0.89        61
  macro avg       0.88      0.89      0.88        61
weighted avg       0.89      0.89      0.89        61



Training Model #  50


Epoch 1/150
1/6 [====>........................] - ETA: 0s - loss: 0.2926 - mean_squared_error: 0.29266/6 [======
Epoch 2/150
1/6 [====>........................] - ETA: 0s - loss: 0.3215 - mean_squared_error: 0.32156/6 [======
Epoch 3/150
1/6 [====>........................] - ETA: 0s - loss: 0.2972 - mean_squared_error: 0.29726/6 [======
Epoch 4/150
1/6 [====>........................] - ETA: 0s - loss: 0.2969 - mean_squared_error: 0.29696/6 [======
Epoch 5/150
1/6 [====>........................] - ETA: 0s - loss: 0.2921 - mean_squared_error: 0.29216/6 [======
Epoch 6/150
1/6 [====>........................] - ETA: 0s - loss: 0.2615 - mean_squared_error: 0.26156/6 [======
Epoch 7/150
1/6 [====>........................] - ETA: 0s - loss: 0.2536 - mean_squared_error: 0.25366/6 [======
Epoch 8/150
1/6 [====>........................] - ETA: 0s - loss: 0.2574 - mean_squared_error: 0.25746/6 [======
Epoch 9/150
1/6 [====>........................] - ETA: 0s - loss: 0.2650 - mean_squared_error: 0.26506/6 [======
Epoch 10/150
1/6 [====>........................] - ETA: 0s - loss: 0.2947 - mean_squared_error: 0.29476/6 [======
Epoch 11/150
1/6 [====>........................] - ETA: 0s - loss: 0.2799 - mean_squared_error: 0.27996/6 [======
Epoch 12/150
1/6 [====>........................] - ETA: 0s - loss: 0.2420 - mean_squared_error: 0.24206/6 [======
Epoch 13/150
1/6 [====>........................] - ETA: 0s - loss: 0.2388 - mean_squared_error: 0.23886/6 [======
Epoch 14/150
1/6 [====>........................] - ETA: 0s - loss: 0.2224 - mean_squared_error: 0.22246/6 [======
Epoch 15/150
1/6 [====>........................] - ETA: 0s - loss: 0.2237 - mean_squared_error: 0.22376/6 [======
Epoch 16/150
1/6 [====>........................] - ETA: 0s - loss: 0.1879 - mean_squared_error: 0.18796/6 [======
Epoch 17/150
1/6 [====>........................] - ETA: 0s - loss: 0.2526 - mean_squared_error: 0.25266/6 [======
Epoch 18/150
1/6 [====>........................] - ETA: 0s - loss: 0.2125 - mean_squared_error: 0.21256/6 [======
Epoch 19/150
```

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1/6 [====>.........................] - ETA: 0s - loss: 0.2163 - mean_squared_error: 0.21636/6 [======
Epoch 20/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1823 - mean_squared_error: 0.18236/6 [======
Epoch 21/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1911 - mean_squared_error: 0.19116/6 [======
Epoch 22/150
1/6 [====>.........................] - ETA: 0s - loss: 0.2042 - mean_squared_error: 0.20426/6 [======
Epoch 23/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1733 - mean_squared_error: 0.17336/6 [======
Epoch 24/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1529 - mean_squared_error: 0.15296/6 [======
Epoch 25/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1987 - mean_squared_error: 0.19876/6 [======
Epoch 26/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1843 - mean_squared_error: 0.18436/6 [======
Epoch 27/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1533 - mean_squared_error: 0.15336/6 [======
Epoch 28/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1995 - mean_squared_error: 0.19956/6 [======
Epoch 29/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1540 - mean_squared_error: 0.15406/6 [======
Epoch 30/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1634 - mean_squared_error: 0.16346/6 [======
Epoch 31/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1583 - mean_squared_error: 0.15836/6 [======
Epoch 32/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1280 - mean_squared_error: 0.12806/6 [======
Epoch 33/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1208 - mean_squared_error: 0.12086/6 [======
Epoch 34/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1301 - mean_squared_error: 0.13016/6 [======
Epoch 35/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1818 - mean_squared_error: 0.18186/6 [======
Epoch 36/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1561 - mean_squared_error: 0.15616/6 [======
Epoch 37/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1585 - mean_squared_error: 0.15856/6 [======
Epoch 38/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1134 - mean_squared_error: 0.11346/6 [======
Epoch 39/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1020 - mean_squared_error: 0.10206/6 [======
Epoch 40/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0980 - mean_squared_error: 0.09806/6 [======
Epoch 41/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1874 - mean_squared_error: 0.18746/6 [======
Epoch 42/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1176 - mean_squared_error: 0.11766/6 [======
Epoch 43/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1183 - mean_squared_error: 0.11836/6 [======
Epoch 44/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1068 - mean_squared_error: 0.10686/6 [======
Epoch 45/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1747 - mean_squared_error: 0.17476/6 [======
Epoch 46/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1044 - mean_squared_error: 0.10446/6 [======
Epoch 47/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1601 - mean_squared_error: 0.16016/6 [======
Epoch 48/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1297 - mean_squared_error: 0.12976/6 [======
Epoch 49/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1488 - mean_squared_error: 0.14886/6 [======
Epoch 50/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1151 - mean_squared_error: 0.11516/6 [======
Epoch 51/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0919 - mean_squared_error: 0.09196/6 [======
Epoch 52/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0957 - mean_squared_error: 0.09576/6 [======
Epoch 53/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1045 - mean_squared_error: 0.10456/6 [======
Epoch 54/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1034 - mean_squared_error: 0.10346/6 [======
```

```
Epoch 55/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1164 - mean_squared_error: 0.11646/6 [======
Epoch 56/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1280 - mean_squared_error: 0.12806/6 [======
Epoch 57/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1175 - mean_squared_error: 0.11756/6 [======
Epoch 58/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1588 - mean_squared_error: 0.15886/6 [======
Epoch 59/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0973 - mean_squared_error: 0.09736/6 [======
Epoch 60/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1157 - mean_squared_error: 0.11576/6 [======
Epoch 61/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1874 - mean_squared_error: 0.18746/6 [======
Epoch 62/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0721 - mean_squared_error: 0.07216/6 [======
Epoch 63/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0979 - mean_squared_error: 0.09796/6 [======
Epoch 64/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1044 - mean_squared_error: 0.10446/6 [======
Epoch 65/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1040 - mean_squared_error: 0.10406/6 [======
Epoch 66/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1005 - mean_squared_error: 0.10056/6 [======
Epoch 67/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1506 - mean_squared_error: 0.15066/6 [======
Epoch 68/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1261 - mean_squared_error: 0.12616/6 [======
Epoch 69/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0729 - mean_squared_error: 0.07296/6 [======
Epoch 70/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1159 - mean_squared_error: 0.11596/6 [======
Epoch 71/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1182 - mean_squared_error: 0.11826/6 [======
Epoch 72/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1337 - mean_squared_error: 0.13376/6 [======
Epoch 73/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0997 - mean_squared_error: 0.09976/6 [======
Epoch 74/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1064 - mean_squared_error: 0.10646/6 [======
Epoch 75/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1063 - mean_squared_error: 0.10636/6 [======
Epoch 76/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1266 - mean_squared_error: 0.12666/6 [======
Epoch 77/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1553 - mean_squared_error: 0.15536/6 [======
Epoch 78/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0818 - mean_squared_error: 0.08186/6 [======
Epoch 79/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1170 - mean_squared_error: 0.11706/6 [======
Epoch 80/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1184 - mean_squared_error: 0.11846/6 [======
Epoch 81/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0878 - mean_squared_error: 0.08786/6 [======
Epoch 82/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0907 - mean_squared_error: 0.09076/6 [======
Epoch 83/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1015 - mean_squared_error: 0.10156/6 [======
Epoch 84/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1229 - mean_squared_error: 0.12296/6 [======
Epoch 85/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1001 - mean_squared_error: 0.10016/6 [======
Epoch 86/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0928 - mean_squared_error: 0.09286/6 [======
Epoch 87/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0771 - mean_squared_error: 0.07716/6 [======
Epoch 88/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1077 - mean_squared_error: 0.10776/6 [======
Epoch 89/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1255 - mean_squared_error: 0.12556/6 [======
Epoch 90/150
```

```
1/6 [====>.........................] - ETA: 0s - loss: 0.0695 - mean_squared_error: 0.06956/6 [======
Epoch 91/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0460 - mean_squared_error: 0.04606/6 [======
Epoch 92/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0940 - mean_squared_error: 0.09406/6 [======
Epoch 93/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1126 - mean_squared_error: 0.11266/6 [======
Epoch 94/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1263 - mean_squared_error: 0.12636/6 [======
Epoch 95/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0827 - mean_squared_error: 0.08276/6 [======
Epoch 96/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0728 - mean_squared_error: 0.07286/6 [======
Epoch 97/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0628 - mean_squared_error: 0.06286/6 [======
Epoch 98/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0992 - mean_squared_error: 0.09926/6 [======
Epoch 99/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0793 - mean_squared_error: 0.07936/6 [======
Epoch 100/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1227 - mean_squared_error: 0.12276/6 [======
Epoch 101/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0609 - mean_squared_error: 0.06096/6 [======
Epoch 102/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0414 - mean_squared_error: 0.04146/6 [======
Epoch 103/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1275 - mean_squared_error: 0.12756/6 [======
Epoch 104/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0731 - mean_squared_error: 0.07316/6 [======
Epoch 105/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0642 - mean_squared_error: 0.06426/6 [======
Epoch 106/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0898 - mean_squared_error: 0.08986/6 [======
Epoch 107/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0947 - mean_squared_error: 0.09476/6 [======
Epoch 108/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0930 - mean_squared_error: 0.09306/6 [======
Epoch 109/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1404 - mean_squared_error: 0.14046/6 [======
Epoch 110/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0885 - mean_squared_error: 0.08856/6 [======
Epoch 111/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1043 - mean_squared_error: 0.10436/6 [======
Epoch 112/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0717 - mean_squared_error: 0.07176/6 [======
Epoch 113/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0591 - mean_squared_error: 0.05916/6 [======
Epoch 114/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0559 - mean_squared_error: 0.05596/6 [======
Epoch 115/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0626 - mean_squared_error: 0.06266/6 [======
Epoch 116/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0587 - mean_squared_error: 0.05876/6 [======
Epoch 117/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0774 - mean_squared_error: 0.07746/6 [======
Epoch 118/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0859 - mean_squared_error: 0.08596/6 [======
Epoch 119/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0652 - mean_squared_error: 0.06526/6 [======
Epoch 120/150
1/6 [====>.........................] - ETA: 0s - loss: 0.1296 - mean_squared_error: 0.12966/6 [======
Epoch 121/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0302 - mean_squared_error: 0.03026/6 [======
Epoch 122/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0723 - mean_squared_error: 0.07236/6 [======
Epoch 123/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0465 - mean_squared_error: 0.04656/6 [======
Epoch 124/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0964 - mean_squared_error: 0.09646/6 [======
Epoch 125/150
1/6 [====>.........................] - ETA: 0s - loss: 0.0738 - mean_squared_error: 0.07386/6 [======
```

```
Epoch 126/150
1/6 [====>........................] – ETA: 0s – loss: 0.0900 – mean_squared_error: 0.09006/6 [======
Epoch 127/150
1/6 [====>........................] – ETA: 0s – loss: 0.1540 – mean_squared_error: 0.15406/6 [======
Epoch 128/150
1/6 [====>........................] – ETA: 0s – loss: 0.0569 – mean_squared_error: 0.05696/6 [======
Epoch 129/150
1/6 [====>........................] – ETA: 0s – loss: 0.0297 – mean_squared_error: 0.02976/6 [======
Epoch 130/150
1/6 [====>........................] – ETA: 0s – loss: 0.0480 – mean_squared_error: 0.04806/6 [======
Epoch 131/150
1/6 [====>........................] – ETA: 0s – loss: 0.0450 – mean_squared_error: 0.04506/6 [======
Epoch 132/150
1/6 [====>........................] – ETA: 0s – loss: 0.0233 – mean_squared_error: 0.02336/6 [======
Epoch 133/150
1/6 [====>........................] – ETA: 0s – loss: 0.0711 – mean_squared_error: 0.07116/6 [======
Epoch 134/150
1/6 [====>........................] – ETA: 0s – loss: 0.0645 – mean_squared_error: 0.06456/6 [======
Epoch 135/150
1/6 [====>........................] – ETA: 0s – loss: 0.1107 – mean_squared_error: 0.11076/6 [======
Epoch 136/150
1/6 [====>........................] – ETA: 0s – loss: 0.1175 – mean_squared_error: 0.11756/6 [======
Epoch 137/150
1/6 [====>........................] – ETA: 0s – loss: 0.0674 – mean_squared_error: 0.06746/6 [======
Epoch 138/150
1/6 [====>........................] – ETA: 0s – loss: 0.0942 – mean_squared_error: 0.09426/6 [======
Epoch 139/150
1/6 [====>........................] – ETA: 0s – loss: 0.0989 – mean_squared_error: 0.09896/6 [======
Epoch 140/150
1/6 [====>........................] – ETA: 0s – loss: 0.1313 – mean_squared_error: 0.13136/6 [======
Epoch 141/150
1/6 [====>........................] – ETA: 0s – loss: 0.0747 – mean_squared_error: 0.07476/6 [======
Epoch 142/150
1/6 [====>........................] – ETA: 0s – loss: 0.0492 – mean_squared_error: 0.04926/6 [======
Epoch 143/150
1/6 [====>........................] – ETA: 0s – loss: 0.0373 – mean_squared_error: 0.03736/6 [======
Epoch 144/150
1/6 [====>........................] – ETA: 0s – loss: 0.0933 – mean_squared_error: 0.09336/6 [======
Epoch 145/150
1/6 [====>........................] – ETA: 0s – loss: 0.0428 – mean_squared_error: 0.04286/6 [======
Epoch 146/150
1/6 [====>........................] – ETA: 0s – loss: 0.1026 – mean_squared_error: 0.10266/6 [======
Epoch 147/150
1/6 [====>........................] – ETA: 0s – loss: 0.0741 – mean_squared_error: 0.07416/6 [======
Epoch 148/150
1/6 [====>........................] – ETA: 0s – loss: 0.1041 – mean_squared_error: 0.10416/6 [======
Epoch 149/150
1/6 [====>........................] – ETA: 0s – loss: 0.0941 – mean_squared_error: 0.09416/6 [======
Epoch 150/150
1/6 [====>........................] – ETA: 0s – loss: 0.0643 – mean_squared_error: 0.06436/6 [======
```

```
MSE on Train Set for Training Model # 50  =  0.08894515539542192

MSE on Test Set for Training Model # 50  =  0.09401298107623053

              precision    recall  f1-score   support

           0       0.82      0.92      0.87        25
           1       0.94      0.86      0.90        36

    accuracy                           0.89        61
   macro avg       0.88      0.89      0.88        61
weighted avg       0.89      0.89      0.89        61
```

```python
# Calculate Mean of the MSE
model_m.summary()

print("\n\nModel Evaluation on 50 models with 150 epochs")

mean_train = stats.mean(mse_list_train)
mean_test = stats.mean(mse_list_test)

print('\n\nTraining Set:')
print('Mean MSE of training set of 50 Models : ' , mean_train)
print('Standard Deviation of MSE of training set of 50 Models : ' , stats.stdev(mse_list_train))
print("Mean accuracy of training-set of 50 models = ", 100 - mean_train*100)

print('\n\nTesting Set:')
print('Mean MSE of testing set of 50 Models : ' , mean_test)
print('Standard Deviation of MSE on testing set of 50 Models : ' , stats.stdev(mse_list_test))
print("Mean accuracy of testing-set of 50 models = ", 100 - mean_test*100)
```

```
Model: "sequential_50"
_____
Layer (type)                 Output Shape              Param #
===============================================================
dense_150 (Dense)            (None, 10)                140
_____
dense_151 (Dense)            (None, 10)                110
_____
dense_152 (Dense)            (None, 1)                 11
===============================================================
Total params: 261
Trainable params: 261
Non-trainable params: 0
_____


Model Evaluation on 50 models with 150 epochs


Training Set:
Mean MSE of training set of 50 Models :  0.08533571152094625
Standard Deviation of MSE of training set of 50 Models :  0.007051511416884449
Mean accuracy of training-set of 50 models =  91.46642884790538


Testing Set:
Mean MSE of testing set of 50 Models :  0.09551019556353586
Standard Deviation of MSE on testing set of 50 Models :  0.013108636154604005
Mean accuracy of testing-set of 50 models =  90.44898044364642
```

Comments:

This Neural Network has very high training accuracy but with a low testing accuracy. The neural network suffers from high varience.

Possible Remedy:

1. Model Averaging using only 20 epochs
2. using Distance Metric on mixed type dataset
3. Getting more training examples
4. Trying neural network with less units and layers
5. Trying smaller set of features

Comparison between models:

```python
x_axis = ['\nLogistic Regression', '\nDecision Tree', '\nKeras Model\n(average over 50 models)']
y_axis = [100 - 100*y_1, 100 - 100*y_2, 100 - 100*mean_test]

plots = sns.barplot(x = x_axis, y = y_axis, palette = "rocket")
for bar in plots.patches:
    plots.annotate(format(bar.get_height(), '.2f'), (bar.get_x() + bar.get_width() / 2, bar.get_heigh
                    ha = 'center', va = 'center', size = 12, xytext=(0, 8), textcoords='offset points'
sns.despine(left = True, bottom = True)
sns.set_theme(style = "white")
plt.tick_params(labelleft=False, left=False)
plt.ylim([0, 100])
plt.xlabel("\nModel Comparison", fontsize = 14)
plt.show()
```
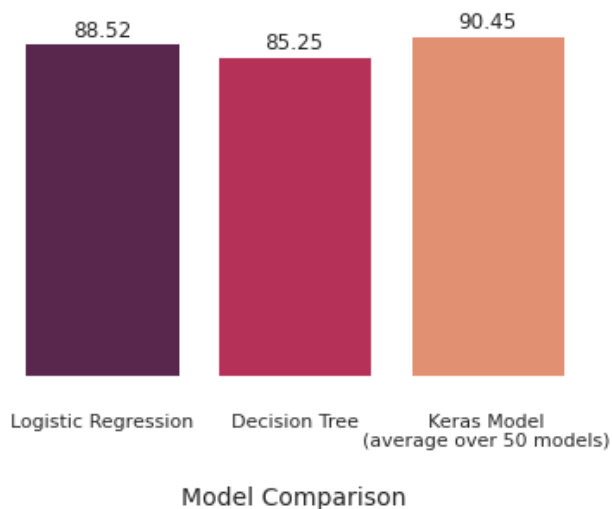

Observation:

Keras Model is well optimised.