**NFT ASSIGNMENT-2**

# Import necessary libraries

import pandas as pd

import numpy as np

from sklearn.model\_selection import train\_test\_split, StratifiedShuffleSplit

from sklearn.preprocessing import LabelEncoder, StandardScaler

from tensorflow.keras.models import Sequential

from tensorflow.keras.layers import Conv1D, MaxPooling1D, Flatten, Dense, Dropout

from tensorflow.keras.optimizers import Adam

from sklearn.metrics import accuracy\_score, classification\_report, confusion\_matrix

import matplotlib.pyplot as plt

import seaborn as sns

# Load the dataset

df = pd.read\_csv("Loan Prediction Dataset.csv")

# Data preprocessing

# Handle missing values

df['LoanAmount'] = df['LoanAmount'].fillna(df['LoanAmount'].mean())

df['Loan\_Amount\_Term'] = df['Loan\_Amount\_Term'].fillna(df['Loan\_Amount\_Term'].mean())

df['Credit\_History'] = df['Credit\_History'].fillna(df['Credit\_History'].mean())

df['Gender'] = df['Gender'].fillna(df['Gender'].mode()[0])

df['Married'] = df['Married'].fillna(df['Married'].mode()[0])

df['Dependents'] = df['Dependents'].fillna(df['Dependents'].mode()[0])

df['Self\_Employed'] = df['Self\_Employed'].fillna(df['Self\_Employed'].mode()[0])

# Log-transform numerical features

df['ApplicantIncome'] = np.log(df['ApplicantIncome'])

df['CoapplicantIncome'] = np.log(df['CoapplicantIncome'] + 1)  # Adding 1 to avoid log(0)

df['LoanAmount'] = np.log(df['LoanAmount'])

df['Loan\_Amount\_Term'] = np.log(df['Loan\_Amount\_Term'] + 1)  # Adding 1 to avoid log(0)

# Encode categorical variables

encoder = LabelEncoder()

categorical\_columns = ['Gender', 'Married', 'Dependents', 'Education', 'Self\_Employed', 'Property\_Area', 'Loan\_Status']

for col in categorical\_columns:

    df[col] = encoder.fit\_transform(df[col])

# Split the data using Stratified Shuffle Split

split = StratifiedShuffleSplit(n\_splits=1, test\_size=0.2, random\_state=42)

for train\_index, test\_index in split.split(df, df["Loan\_Status"]):

    train\_set = df.loc[train\_index]

    test\_set = df.loc[test\_index]

# Prepare data for training and testing

X\_train = train\_set.drop(columns=['Loan\_Status', 'Loan\_ID'], axis=1)

y\_train = train\_set['Loan\_Status']

X\_test = test\_set.drop(columns=['Loan\_Status', 'Loan\_ID'], axis=1)

y\_test = test\_set['Loan\_Status']

# Standardize the features

scaler = StandardScaler()

X\_train = scaler.fit\_transform(X\_train)

X\_test = scaler.transform(X\_test)

# Reshape data for Convolutional Neural Network (CNN) input

X\_train\_img = X\_train.reshape(X\_train.shape[0], X\_train.shape[1], 1)

X\_test\_img = X\_test.reshape(X\_test.shape[0], X\_test.shape[1], 1)

# Build the CNN model

model = Sequential([

    Conv1D(64, 7, activation='relu', padding='same', input\_shape=(X\_train.shape[1], 1)),

    MaxPooling1D(2),

    Conv1D(128, 5, activation='relu', padding='same'),

    MaxPooling1D(2),

    Conv1D(256, 3, activation='relu', padding='same'),

    MaxPooling1D(2),

    Flatten(),

    Dense(512, activation='relu'),

    Dropout(0.5),

    Dense(256, activation='relu'),

    Dropout(0.5),

    Dense(1, activation='sigmoid')

])

# Compile the model

model.compile(optimizer=Adam(learning\_rate=0.0001), loss='binary\_crossentropy', metrics=['accuracy'])

# Train the model

model.fit(X\_train\_img, y\_train, epochs=100, batch\_size=64, validation\_split=0.2)

# Evaluate the model on the test data

accuracy = model.evaluate(X\_test\_img, y\_test)[1]

# Make predictions and convert to binary

predictions = model.predict(X\_test\_img)

binary\_predictions = (predictions >= 0.5).astype(int)

# Display binary predictions, confusion matrix, and heatmap

print(binary\_predictions)

conf\_matrix = confusion\_matrix(y\_test, binary\_predictions)

print("Confusion Matrix:")

print(conf\_matrix)

sns.heatmap(conf\_matrix, annot=True, fmt='d', cmap='Blues',

            xticklabels=['Not Approved', 'Approved'],

            yticklabels=['Not Approved', 'Approved'])

plt.xlabel('Predicted')

plt.ylabel('Actual')

plt.title('Confusion Matrix')

plt.show()

# Plot training history

plt.plot(history.history['accuracy'], label='Train Accuracy')

plt.plot(history.history['val\_accuracy'], label = 'Validation Accuracy')

plt.xlabel('Epoch')

plt.ylabel('Accuracy')

plt.legend(loc='lower right')

plt.show()

Epoch 1/100

7/7 [==============================] - 4s 149ms/step - loss: 0.6915 - accuracy: 0.5434 - val\_loss: 0.6759 - val\_accuracy: 0.6970

Epoch 2/100

7/7 [==============================] - 0s 67ms/step - loss: 0.6712 - accuracy: 0.6658 - val\_loss: 0.6583 - val\_accuracy: 0.6970

Epoch 3/100

7/7 [==============================] - 0s 41ms/step - loss: 0.6524 - accuracy: 0.6862 - val\_loss: 0.6436 - val\_accuracy: 0.6970

Epoch 4/100

7/7 [==============================] - 0s 36ms/step - loss: 0.6449 - accuracy: 0.6837 - val\_loss: 0.6320 - val\_accuracy: 0.6970

Epoch 5/100

7/7 [==============================] - 0s 37ms/step - loss: 0.6370 - accuracy: 0.6837 - val\_loss: 0.6249 - val\_accuracy: 0.6970

Epoch 6/100

7/7 [==============================] - 0s 36ms/step - loss: 0.6304 - accuracy: 0.6837 - val\_loss: 0.6215 - val\_accuracy: 0.6970

Epoch 7/100

7/7 [==============================] - 0s 35ms/step - loss: 0.6309 - accuracy: 0.6837 - val\_loss: 0.6191 - val\_accuracy: 0.6970

Epoch 8/100

7/7 [==============================] - 0s 33ms/step - loss: 0.6286 - accuracy: 0.6837 - val\_loss: 0.6153 - val\_accuracy: 0.6970

Epoch 9/100

7/7 [==============================] - 0s 41ms/step - loss: 0.6274 - accuracy: 0.6837 - val\_loss: 0.6118 - val\_accuracy: 0.6970

Epoch 10/100

7/7 [==============================] - 0s 59ms/step - loss: 0.6217 - accuracy: 0.6837 - val\_loss: 0.6070 - val\_accuracy: 0.6970

Epoch 11/100

7/7 [==============================] - 0s 51ms/step - loss: 0.6084 - accuracy: 0.6837 - val\_loss: 0.6023 - val\_accuracy: 0.6970

Epoch 12/100

7/7 [==============================] - 0s 36ms/step - loss: 0.6027 - accuracy: 0.6837 - val\_loss: 0.5969 - val\_accuracy: 0.6970

Epoch 13/100

7/7 [==============================] - 0s 22ms/step - loss: 0.6013 - accuracy: 0.6837 - val\_loss: 0.5906 - val\_accuracy: 0.6970

Epoch 14/100

7/7 [==============================] - 0s 33ms/step - loss: 0.5991 - accuracy: 0.6862 - val\_loss: 0.5837 - val\_accuracy: 0.6970

Epoch 15/100

7/7 [==============================] - 0s 46ms/step - loss: 0.5845 - accuracy: 0.6913 - val\_loss: 0.5773 - val\_accuracy: 0.7071

Epoch 16/100

7/7 [==============================] - 0s 36ms/step - loss: 0.5695 - accuracy: 0.7347 - val\_loss: 0.5695 - val\_accuracy: 0.7475

Epoch 17/100

7/7 [==============================] - 0s 42ms/step - loss: 0.5619 - accuracy: 0.7194 - val\_loss: 0.5623 - val\_accuracy: 0.7071

Epoch 18/100

7/7 [==============================] - 0s 33ms/step - loss: 0.5575 - accuracy: 0.7143 - val\_loss: 0.5566 - val\_accuracy: 0.7374

Epoch 19/100

7/7 [==============================] - 0s 38ms/step - loss: 0.5384 - accuracy: 0.7423 - val\_loss: 0.5461 - val\_accuracy: 0.7778

Epoch 20/100

7/7 [==============================] - 0s 37ms/step - loss: 0.5354 - accuracy: 0.7704 - val\_loss: 0.5398 - val\_accuracy: 0.7778

Epoch 21/100

7/7 [==============================] - 0s 49ms/step - loss: 0.5225 - accuracy: 0.7883 - val\_loss: 0.5326 - val\_accuracy: 0.7879

Epoch 22/100

7/7 [==============================] - 0s 48ms/step - loss: 0.5103 - accuracy: 0.7959 - val\_loss: 0.5271 - val\_accuracy: 0.7980

Epoch 23/100

7/7 [==============================] - 0s 35ms/step - loss: 0.5012 - accuracy: 0.7934 - val\_loss: 0.5219 - val\_accuracy: 0.7778

Epoch 24/100

7/7 [==============================] - 0s 36ms/step - loss: 0.4865 - accuracy: 0.7934 - val\_loss: 0.5205 - val\_accuracy: 0.7778

Epoch 25/100

7/7 [==============================] - 0s 32ms/step - loss: 0.4838 - accuracy: 0.7985 - val\_loss: 0.5217 - val\_accuracy: 0.7778

Epoch 26/100

7/7 [==============================] - 0s 41ms/step - loss: 0.4674 - accuracy: 0.8036 - val\_loss: 0.5287 - val\_accuracy: 0.7879

Epoch 27/100

7/7 [==============================] - 0s 33ms/step - loss: 0.4746 - accuracy: 0.8087 - val\_loss: 0.5320 - val\_accuracy: 0.7879

Epoch 28/100

7/7 [==============================] - 0s 30ms/step - loss: 0.4519 - accuracy: 0.8087 - val\_loss: 0.5266 - val\_accuracy: 0.7879

Epoch 29/100

7/7 [==============================] - 0s 28ms/step - loss: 0.4513 - accuracy: 0.8112 - val\_loss: 0.5332 - val\_accuracy: 0.7980

Epoch 30/100

7/7 [==============================] - 0s 21ms/step - loss: 0.4395 - accuracy: 0.8163 - val\_loss: 0.5351 - val\_accuracy: 0.7879

Epoch 31/100

7/7 [==============================] - 0s 23ms/step - loss: 0.4281 - accuracy: 0.8163 - val\_loss: 0.5352 - val\_accuracy: 0.7879

Epoch 32/100

7/7 [==============================] - 0s 22ms/step - loss: 0.4349 - accuracy: 0.8112 - val\_loss: 0.5331 - val\_accuracy: 0.7879

Epoch 33/100

7/7 [==============================] - 0s 21ms/step - loss: 0.4087 - accuracy: 0.8265 - val\_loss: 0.5432 - val\_accuracy: 0.7879

Epoch 34/100

7/7 [==============================] - 0s 21ms/step - loss: 0.4190 - accuracy: 0.8291 - val\_loss: 0.5402 - val\_accuracy: 0.7879

Epoch 35/100

7/7 [==============================] - 0s 22ms/step - loss: 0.4022 - accuracy: 0.8240 - val\_loss: 0.5422 - val\_accuracy: 0.7879

Epoch 36/100

7/7 [==============================] - 0s 22ms/step - loss: 0.4001 - accuracy: 0.8240 - val\_loss: 0.5500 - val\_accuracy: 0.7879

Epoch 37/100

7/7 [==============================] - 0s 20ms/step - loss: 0.3896 - accuracy: 0.8342 - val\_loss: 0.5523 - val\_accuracy: 0.7778

Epoch 38/100

7/7 [==============================] - 0s 20ms/step - loss: 0.4004 - accuracy: 0.8189 - val\_loss: 0.5608 - val\_accuracy: 0.7879

Epoch 39/100

7/7 [==============================] - 0s 21ms/step - loss: 0.3785 - accuracy: 0.8469 - val\_loss: 0.5639 - val\_accuracy: 0.7475

Epoch 40/100

7/7 [==============================] - 0s 20ms/step - loss: 0.3615 - accuracy: 0.8673 - val\_loss: 0.5789 - val\_accuracy: 0.7778

Epoch 41/100

7/7 [==============================] - 0s 22ms/step - loss: 0.3814 - accuracy: 0.8265 - val\_loss: 0.5841 - val\_accuracy: 0.7677

Epoch 42/100

7/7 [==============================] - 0s 22ms/step - loss: 0.3755 - accuracy: 0.8495 - val\_loss: 0.5823 - val\_accuracy: 0.7374

Epoch 43/100

7/7 [==============================] - 0s 22ms/step - loss: 0.3511 - accuracy: 0.8546 - val\_loss: 0.5966 - val\_accuracy: 0.7980

Epoch 44/100

7/7 [==============================] - 0s 21ms/step - loss: 0.3486 - accuracy: 0.8495 - val\_loss: 0.5857 - val\_accuracy: 0.7677

Epoch 45/100

7/7 [==============================] - 0s 24ms/step - loss: 0.3419 - accuracy: 0.8495 - val\_loss: 0.5900 - val\_accuracy: 0.7475

Epoch 46/100

7/7 [==============================] - 0s 22ms/step - loss: 0.3385 - accuracy: 0.8750 - val\_loss: 0.5949 - val\_accuracy: 0.7576

Epoch 47/100

7/7 [==============================] - 0s 22ms/step - loss: 0.3246 - accuracy: 0.8699 - val\_loss: 0.6041 - val\_accuracy: 0.7475

Epoch 48/100

7/7 [==============================] - 0s 23ms/step - loss: 0.3451 - accuracy: 0.8699 - val\_loss: 0.6115 - val\_accuracy: 0.7374

Epoch 49/100

7/7 [==============================] - 0s 34ms/step - loss: 0.3264 - accuracy: 0.8546 - val\_loss: 0.6331 - val\_accuracy: 0.7879

Epoch 50/100

7/7 [==============================] - 0s 32ms/step - loss: 0.3203 - accuracy: 0.8776 - val\_loss: 0.6219 - val\_accuracy: 0.6869

Epoch 51/100

7/7 [==============================] - 0s 32ms/step - loss: 0.3684 - accuracy: 0.8495 - val\_loss: 0.6250 - val\_accuracy: 0.7475

Epoch 52/100

7/7 [==============================] - 0s 32ms/step - loss: 0.3052 - accuracy: 0.8622 - val\_loss: 0.6484 - val\_accuracy: 0.7677

Epoch 53/100

7/7 [==============================] - 0s 31ms/step - loss: 0.3086 - accuracy: 0.8750 - val\_loss: 0.6382 - val\_accuracy: 0.7071

Epoch 54/100

7/7 [==============================] - 0s 31ms/step - loss: 0.3086 - accuracy: 0.8724 - val\_loss: 0.6508 - val\_accuracy: 0.7475

Epoch 55/100

7/7 [==============================] - 0s 34ms/step - loss: 0.2887 - accuracy: 0.8699 - val\_loss: 0.6463 - val\_accuracy: 0.7475

Epoch 56/100

7/7 [==============================] - 0s 32ms/step - loss: 0.2891 - accuracy: 0.8750 - val\_loss: 0.6441 - val\_accuracy: 0.7273

Epoch 57/100

7/7 [==============================] - 0s 35ms/step - loss: 0.2870 - accuracy: 0.9005 - val\_loss: 0.6568 - val\_accuracy: 0.7475

Epoch 58/100

7/7 [==============================] - 0s 31ms/step - loss: 0.2996 - accuracy: 0.8571 - val\_loss: 0.6558 - val\_accuracy: 0.7475

Epoch 59/100

7/7 [==============================] - 0s 32ms/step - loss: 0.2650 - accuracy: 0.8903 - val\_loss: 0.6654 - val\_accuracy: 0.7172

Epoch 60/100

7/7 [==============================] - 0s 34ms/step - loss: 0.2828 - accuracy: 0.8878 - val\_loss: 0.6855 - val\_accuracy: 0.7576

Epoch 61/100

7/7 [==============================] - 0s 33ms/step - loss: 0.3026 - accuracy: 0.8648 - val\_loss: 0.6843 - val\_accuracy: 0.7475

Epoch 62/100

7/7 [==============================] - 0s 23ms/step - loss: 0.2901 - accuracy: 0.8801 - val\_loss: 0.6793 - val\_accuracy: 0.6869

Epoch 63/100

7/7 [==============================] - 0s 21ms/step - loss: 0.2794 - accuracy: 0.8903 - val\_loss: 0.6925 - val\_accuracy: 0.7475

Epoch 64/100

7/7 [==============================] - 0s 22ms/step - loss: 0.2571 - accuracy: 0.9005 - val\_loss: 0.6808 - val\_accuracy: 0.6869

Epoch 65/100

7/7 [==============================] - 0s 20ms/step - loss: 0.2586 - accuracy: 0.8954 - val\_loss: 0.6931 - val\_accuracy: 0.7475

Epoch 66/100

7/7 [==============================] - 0s 24ms/step - loss: 0.2595 - accuracy: 0.8878 - val\_loss: 0.6867 - val\_accuracy: 0.7374

Epoch 67/100

7/7 [==============================] - 0s 24ms/step - loss: 0.2416 - accuracy: 0.8929 - val\_loss: 0.7016 - val\_accuracy: 0.7374

Epoch 68/100

7/7 [==============================] - 0s 20ms/step - loss: 0.2537 - accuracy: 0.8878 - val\_loss: 0.7006 - val\_accuracy: 0.7273

Epoch 69/100

7/7 [==============================] - 0s 23ms/step - loss: 0.2471 - accuracy: 0.8929 - val\_loss: 0.7085 - val\_accuracy: 0.7374

Epoch 70/100

7/7 [==============================] - 0s 22ms/step - loss: 0.2464 - accuracy: 0.9056 - val\_loss: 0.7084 - val\_accuracy: 0.6768

Epoch 71/100

7/7 [==============================] - 0s 21ms/step - loss: 0.2286 - accuracy: 0.9133 - val\_loss: 0.7373 - val\_accuracy: 0.7475

Epoch 72/100

7/7 [==============================] - 0s 21ms/step - loss: 0.2310 - accuracy: 0.9031 - val\_loss: 0.7150 - val\_accuracy: 0.7172

Epoch 73/100

7/7 [==============================] - 0s 20ms/step - loss: 0.2221 - accuracy: 0.9107 - val\_loss: 0.7139 - val\_accuracy: 0.7273

Epoch 74/100

7/7 [==============================] - 0s 21ms/step - loss: 0.2181 - accuracy: 0.9107 - val\_loss: 0.7078 - val\_accuracy: 0.6869

Epoch 75/100

7/7 [==============================] - 0s 21ms/step - loss: 0.2359 - accuracy: 0.9209 - val\_loss: 0.7190 - val\_accuracy: 0.7273

Epoch 76/100

7/7 [==============================] - 0s 21ms/step - loss: 0.2152 - accuracy: 0.9158 - val\_loss: 0.7331 - val\_accuracy: 0.7172

Epoch 77/100

7/7 [==============================] - 0s 23ms/step - loss: 0.1972 - accuracy: 0.9260 - val\_loss: 0.7339 - val\_accuracy: 0.6667

Epoch 78/100

7/7 [==============================] - 0s 20ms/step - loss: 0.1830 - accuracy: 0.9362 - val\_loss: 0.7621 - val\_accuracy: 0.7374

Epoch 79/100

7/7 [==============================] - 0s 22ms/step - loss: 0.1993 - accuracy: 0.9209 - val\_loss: 0.7613 - val\_accuracy: 0.7071

Epoch 80/100

7/7 [==============================] - 0s 22ms/step - loss: 0.1761 - accuracy: 0.9362 - val\_loss: 0.7636 - val\_accuracy: 0.6667

Epoch 81/100

7/7 [==============================] - 0s 23ms/step - loss: 0.1883 - accuracy: 0.9388 - val\_loss: 0.7797 - val\_accuracy: 0.7576

Epoch 82/100

7/7 [==============================] - 0s 23ms/step - loss: 0.2307 - accuracy: 0.8954 - val\_loss: 0.7522 - val\_accuracy: 0.6970

Epoch 83/100

7/7 [==============================] - 0s 22ms/step - loss: 0.1820 - accuracy: 0.9439 - val\_loss: 0.7486 - val\_accuracy: 0.6970

Epoch 84/100

7/7 [==============================] - 0s 22ms/step - loss: 0.1799 - accuracy: 0.9235 - val\_loss: 0.7694 - val\_accuracy: 0.7475

Epoch 85/100

7/7 [==============================] - 0s 22ms/step - loss: 0.1739 - accuracy: 0.9337 - val\_loss: 0.7790 - val\_accuracy: 0.7071

Epoch 86/100

7/7 [==============================] - 0s 23ms/step - loss: 0.1693 - accuracy: 0.9286 - val\_loss: 0.8003 - val\_accuracy: 0.6667

Epoch 87/100

7/7 [==============================] - 0s 22ms/step - loss: 0.1873 - accuracy: 0.9388 - val\_loss: 0.8229 - val\_accuracy: 0.7273

Epoch 88/100

7/7 [==============================] - 0s 24ms/step - loss: 0.1800 - accuracy: 0.9260 - val\_loss: 0.8238 - val\_accuracy: 0.7273

Epoch 89/100

7/7 [==============================] - 0s 22ms/step - loss: 0.1565 - accuracy: 0.9413 - val\_loss: 0.8176 - val\_accuracy: 0.6667

Epoch 90/100

7/7 [==============================] - 0s 24ms/step - loss: 0.1566 - accuracy: 0.9413 - val\_loss: 0.8433 - val\_accuracy: 0.7374

Epoch 91/100

7/7 [==============================] - 0s 21ms/step - loss: 0.1420 - accuracy: 0.9490 - val\_loss: 0.8413 - val\_accuracy: 0.6869

Epoch 92/100

7/7 [==============================] - 0s 23ms/step - loss: 0.1508 - accuracy: 0.9592 - val\_loss: 0.8473 - val\_accuracy: 0.7172

Epoch 93/100

7/7 [==============================] - 0s 21ms/step - loss: 0.1483 - accuracy: 0.9362 - val\_loss: 0.8241 - val\_accuracy: 0.6768

Epoch 94/100

7/7 [==============================] - 0s 21ms/step - loss: 0.1404 - accuracy: 0.9464 - val\_loss: 0.8313 - val\_accuracy: 0.7172

Epoch 95/100

7/7 [==============================] - 0s 22ms/step - loss: 0.1309 - accuracy: 0.9541 - val\_loss: 0.8422 - val\_accuracy: 0.7172

Epoch 96/100

7/7 [==============================] - 0s 24ms/step - loss: 0.1337 - accuracy: 0.9541 - val\_loss: 0.8570 - val\_accuracy: 0.6970

Epoch 97/100

7/7 [==============================] - 0s 21ms/step - loss: 0.1312 - accuracy: 0.9515 - val\_loss: 0.8732 - val\_accuracy: 0.6869

Epoch 98/100

7/7 [==============================] - 0s 22ms/step - loss: 0.1273 - accuracy: 0.9566 - val\_loss: 0.8875 - val\_accuracy: 0.7374

Epoch 99/100

7/7 [==============================] - 0s 21ms/step - loss: 0.1365 - accuracy: 0.9413 - val\_loss: 0.8791 - val\_accuracy: 0.6566

Epoch 100/100

7/7 [==============================] - 0s 21ms/step - loss: 0.1420 - accuracy: 0.9541 - val\_loss: 0.9467 - val\_accuracy: 0.7576

4/4 [==============================] - 0s 5ms/step - loss: 0.8034 - accuracy: 0.8293

4/4 [==============================] - 0s 5ms/step

[[0]

[1]

[1]

[1]

[1]

[0]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[0]

[0]

[1]

[0]

[1]

[1]

[0]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[0]

[1]

[1]

[1]

[1]

[1]

[1]

[0]

[0]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[0]

[0]

[1]

[0]

[1]

[1]

[1]

[0]

[1]

[1]

[1]

[0]

[0]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[0]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[0]

[0]

[1]

[0]

[1]

[1]

[1]

[1]

[0]

[1]

[1]

[1]

[0]

[0]

[1]

[1]

[1]

[0]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[0]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[1]

[0]

[1]

[1]

[1]

[0]

[0]

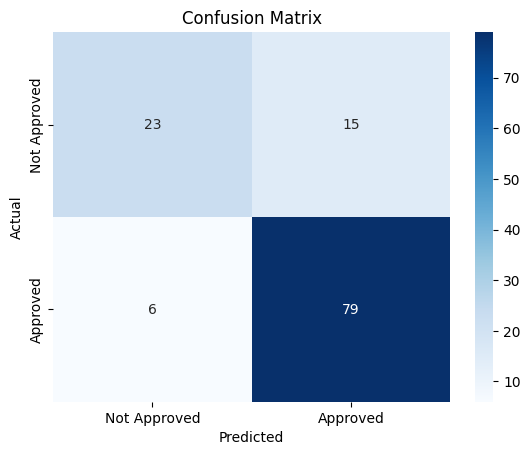
[0]

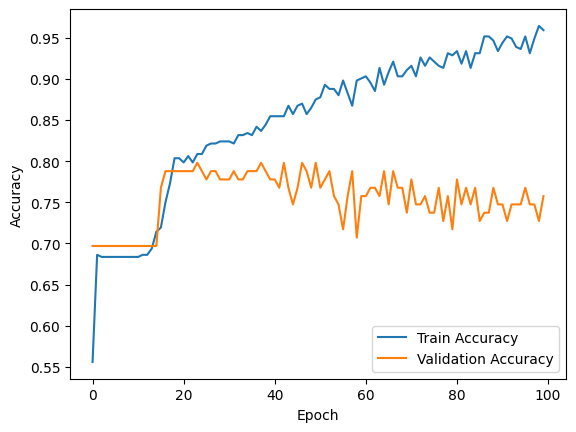
[0]]

Confusion Matrix:

[[23 15]

[ 6 79]]





**DONE BY:**

**BT21CSE106-Anandapu Srihitha**

**BT21CSE100-Katnapalli Rishitha**