

# Heart Disease Prediction using Neural Network

This project predicts the likelihood of heart disease using a Neural Network trained on the Kaggle 'Heart Failure Prediction' dataset. The model is built using TensorFlow and scikit-learn and evaluated using accuracy, confusion matrix, and performance metrics.

## Project Code and Outputs

The screenshot shows a GitHub repository page for 'Karthikbn2004 / MNIST-Digit-Classification'. The repository is public and has 11 commits. The commits are listed below:

Commit	Description	Date
Karthikbn2004 Add files via upload	Implement CNN model architecture for classification	2 weeks ago
Define the CNN Architecture.py	Create Evaluate and Visualize Training History.py	2 weeks ago
Evaluate and Visualize Training History.py	Load and Preprocess Data.py	2 weeks ago
Load and Preprocess Data.py	Project Setup and Imports.py	2 weeks ago
Project Setup and Imports.py	README.md	2 weeks ago
README.md	Initial commit	2 weeks ago
Train the Model.py	Create Train the Model.py	2 weeks ago
Visualize Sample Data.py	Create visualization for sample data images	2 weeks ago
neural networks project.pdf	Add files via upload	2 weeks ago
neural networks readme.pdf	Add files via upload	2 weeks ago

On the right side of the repository page, there are sections for 'About', 'Releases', 'Packages', and 'Languages'. The 'About' section notes 'No description, website, or topics provided.' The 'Languages' section shows Python at 100.0%.

Below the repository page, a Jupyter Notebook output is displayed:

```
... Using Colab cache for faster access to the 'heart-failure-prediction' dataset.
✓ Dataset downloaded at: /kaggle/input/heart-failure-prediction

==== Dataset Preview ====
   Age Sex ChestPainType RestingBP Cholesterol FastingBS RestingECG MaxHR \
0   40   M          ATA      140       289       0    Normal     172
1   49   F          NAP      160       180       0    Normal     156
2   37   M          ATA      130       283       0        ST     98
3   48   F          ASY      138       214       0    Normal     108
4   54   M          NAP      150       195       0    Normal     122

   ExerciseAngina Oldpeak ST_Slope HeartDisease
0              N     0.0      Up         0
1              N     1.0     Flat        1
2              N     0.0      Up         0
3              Y     1.5     Flat        1
4              N     0.0      Up         0

Columns:
Index(['Age', 'Sex', 'ChestPainType', 'RestingBP', 'Cholesterol', 'FastingBS',
       'RestingECG', 'MaxHR', 'ExerciseAngina', 'Oldpeak', 'ST_Slope',
       'HeartDisease'],
      dtype='object')
```

```
*** Missing values:  
Age 0  
Sex 0  
ChestPainType 0  
RestingBP 0  
Cholesterol 0  
FastingBS 0  
RestingECG 0  
MaxHR 0  
ExerciseAngina 0  
Oldpeak 0  
ST_Slope 0  
HeartDisease 0  
dtype: int64  
Model: "sequential"
```

Layer (type)	Output Shape	Param #
dense (Dense)	(None, 32)	512
dense_1 (Dense)	(None, 16)	528
dense_2 (Dense)	(None, 1)	17

```
Total params: 1,057 (4.13 KB)  
Trainable params: 1,057 (4.13 KB)  
Non-trainable params: 0 (0.00 B)
```

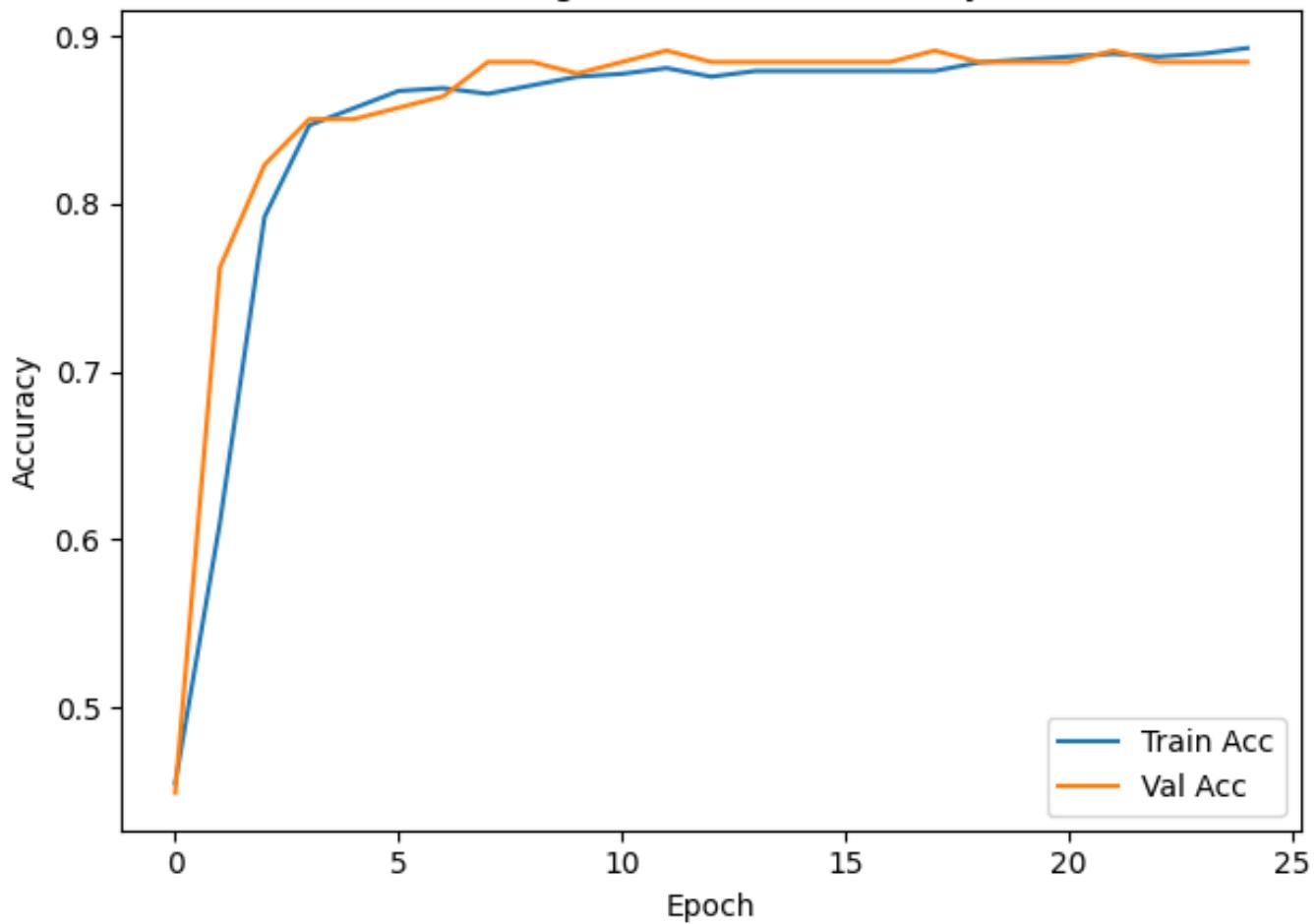
---

```
***  FINAL TEST ACCURACY: 0.8587
```

#### Classification Report:

	precision	recall	f1-score	support
0	0.8590	0.8171	0.8375	82
1	0.8585	0.8922	0.8750	102
accuracy			0.8587	184
macro avg	0.8587	0.8546	0.8562	184
weighted avg	0.8587	0.8587	0.8583	184

### Training vs Validation Accuracy



## Confusion Matrix — Heart Disease Detection

