# TEAM ID: 9

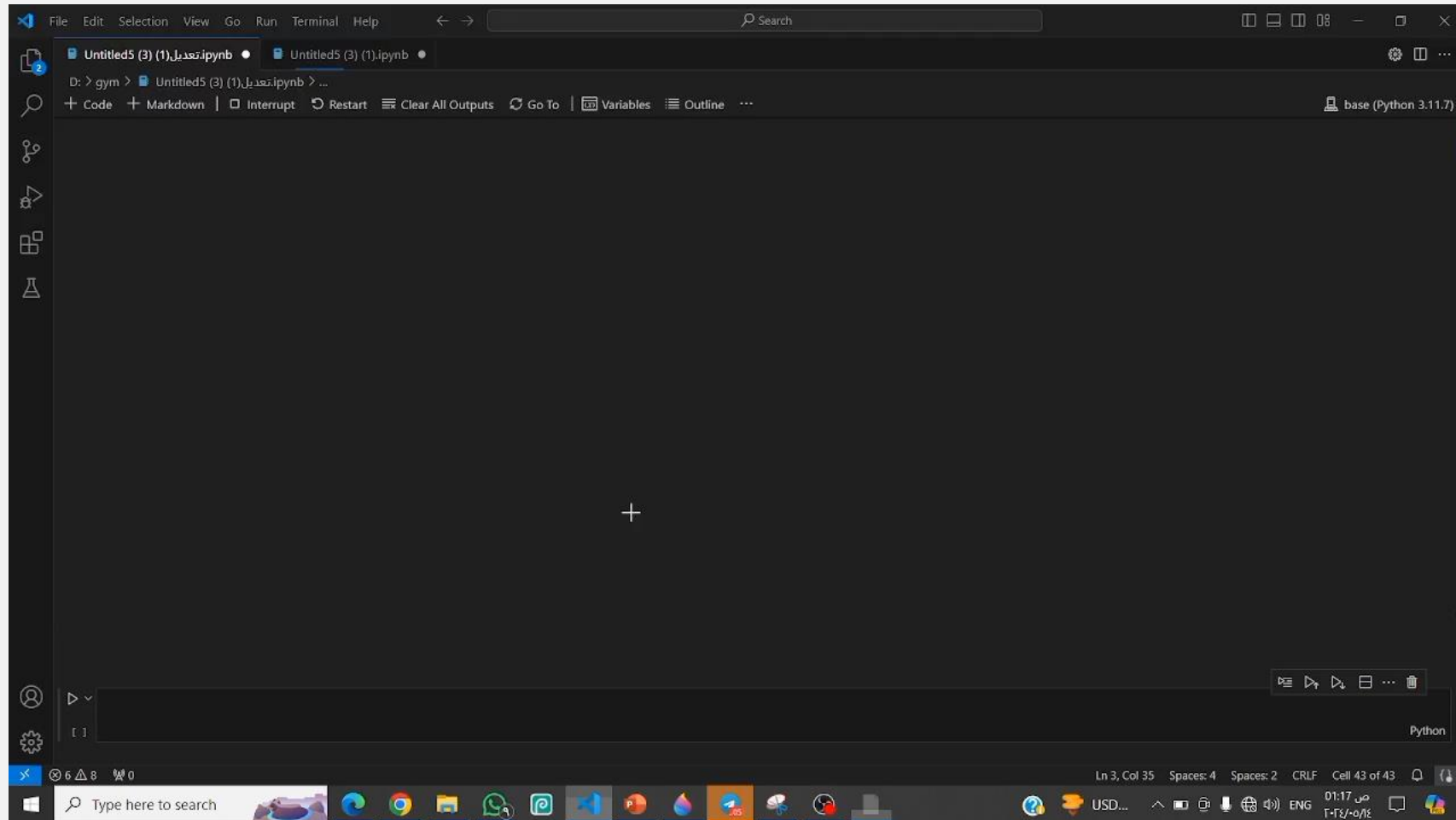| | |
|---|---|
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# AI COACH APP

The model detects eight exercises and identifies true or false :
( Pull Up , Leg Extension ,T Bar Row, Lat Pulldown , Hip
Thrust , Hammer Curl , Chest Fly Machine , Bench Press )

https://github.com/Huda-Mawood/AI-Coach.git

# CONTRIBUTION

1.Collecting video dataset for correct and wrong exercises

2. After training The model , It was not detect well.

3. Increasing number of epoch from 150 to 500

4. Add three Dense Layer to architecture .

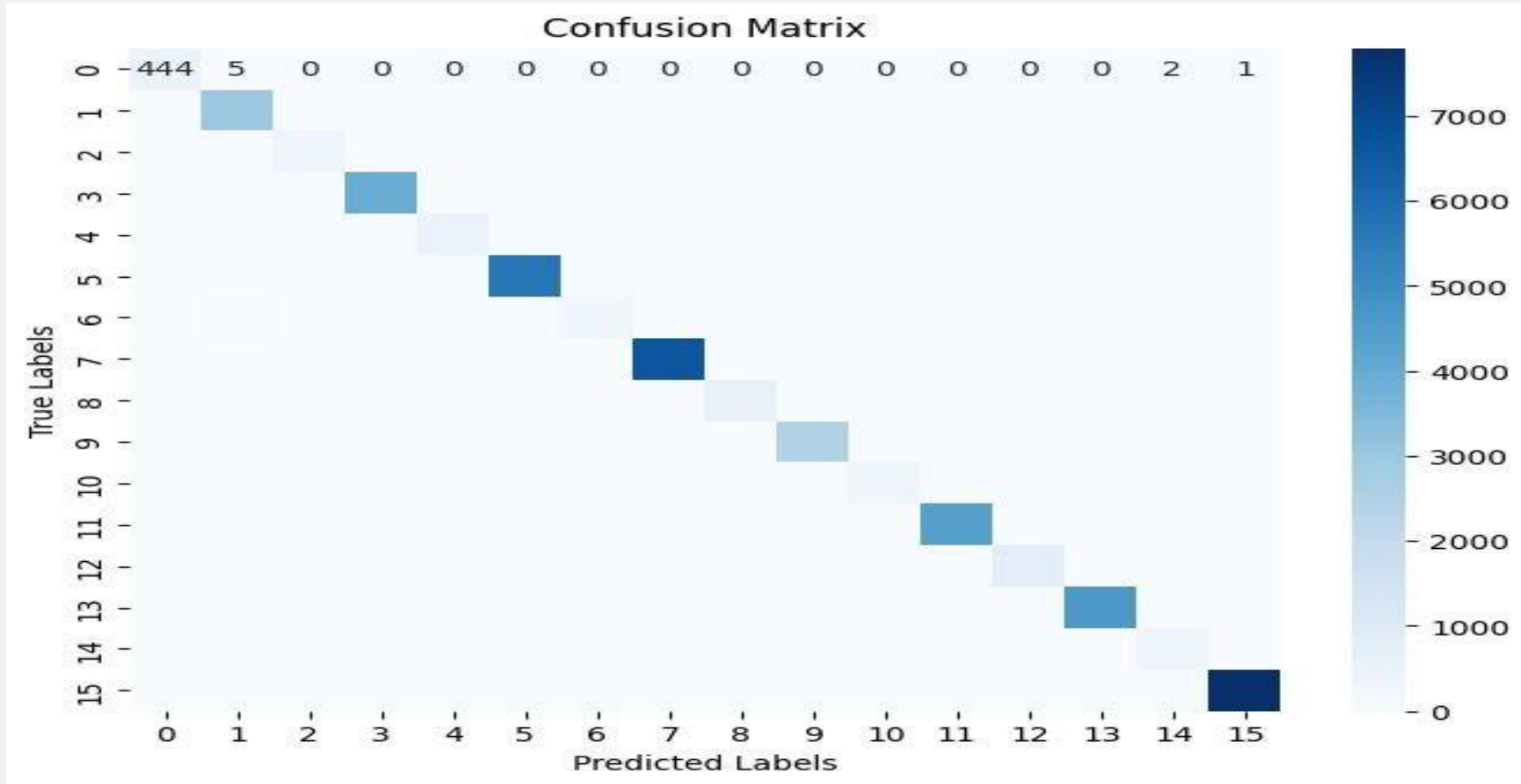5.Training the model again, it detects well and the accuracy is 99%.

# CONTRIBUTION



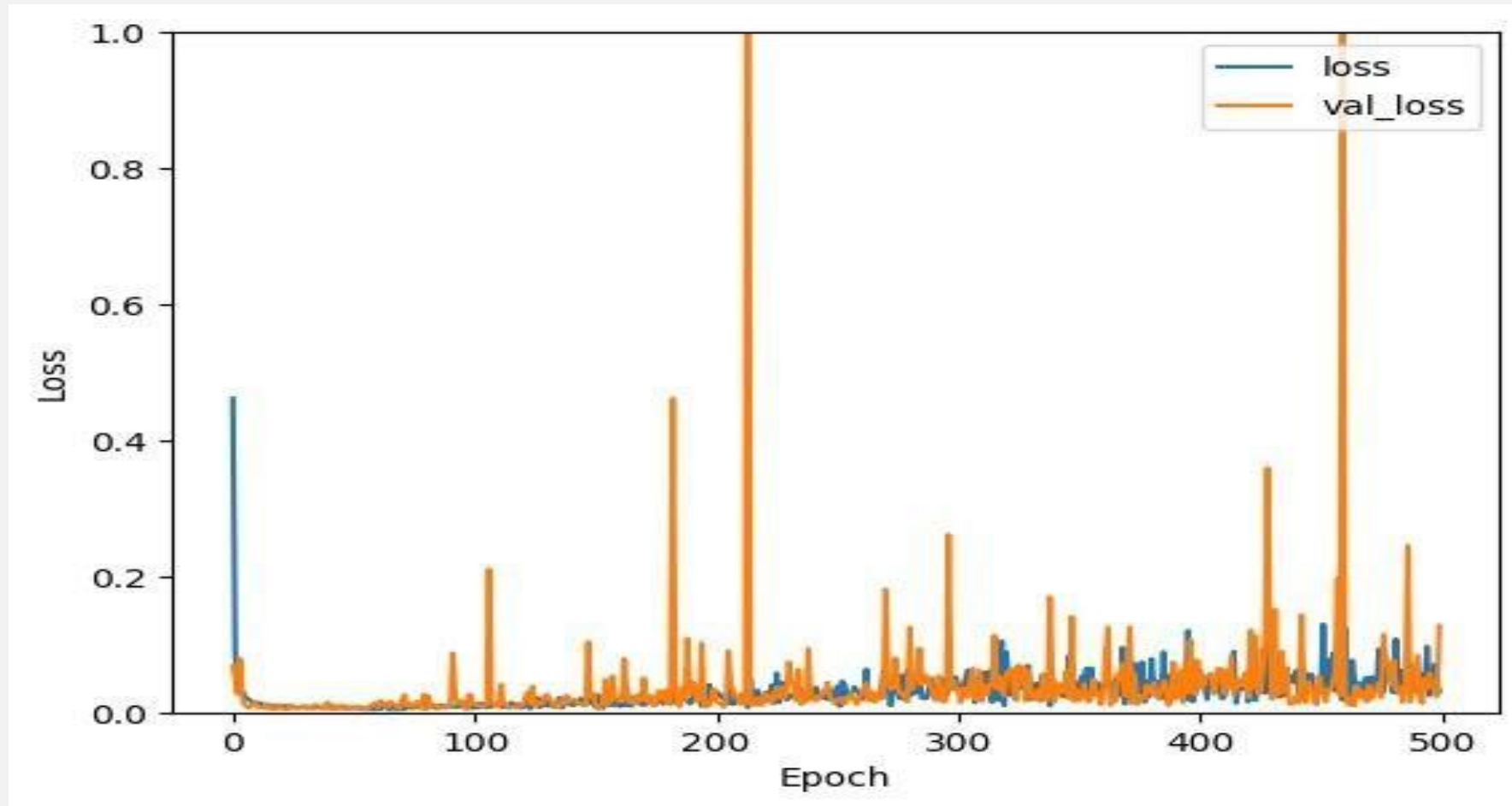Figure 1. Evaluation using confusion matrix

# CONTRIBUTION



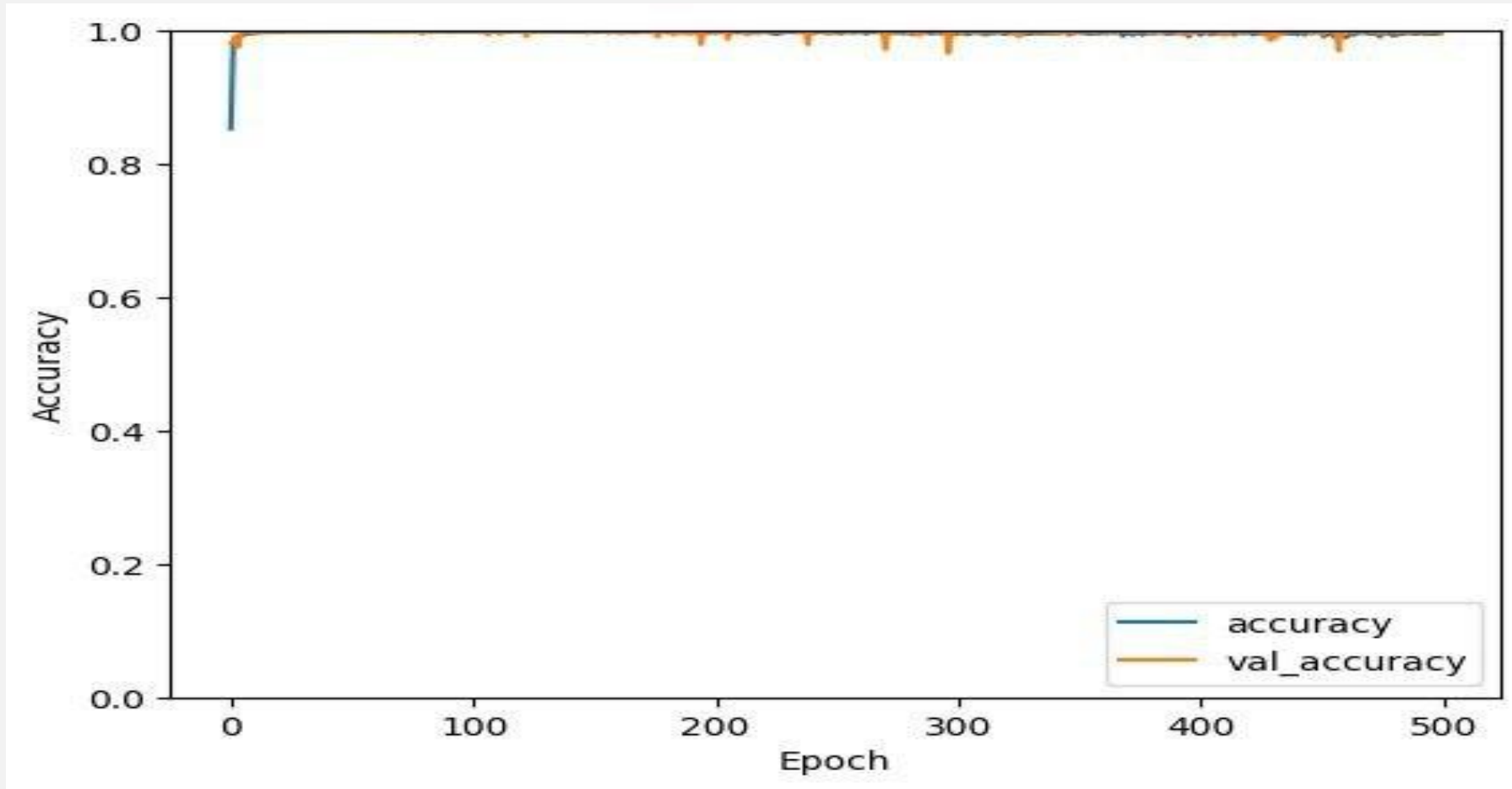Figure 2. Training and Validation Loss Over Epochs

# CONTRIBUTION



Figure 3. Training and testing accuracy over epochs

# DATASET

We collected videos for

- correct exercises from Kaggle: https://www.kaggle.com/datasets/hasyimabdillah/workoutfitness-video

- wrong exercises from YouTube.

**1. Size** :

    1.1. The dataset is consisting of 920 videos.

    1.2. The dataset categorized into 16 classes divided into 8 exercises true and 8 false .

    1.3. each correct exercise consists of 103 videos , and each wrong exercise consist of 12 videos.

**2. Preprocessing** :

    2.1. Labeling and Feature Extraction: - Extracting Information from File Names

                                     - Loading Additional Data from Files

                                     - Assigning Labels to Sequences

**3. Splitting** : The dataset was split into 20% for testing and 80% for training.

# SAMPLES FROM DATASET

**TRUE LAT PULLDOWN**
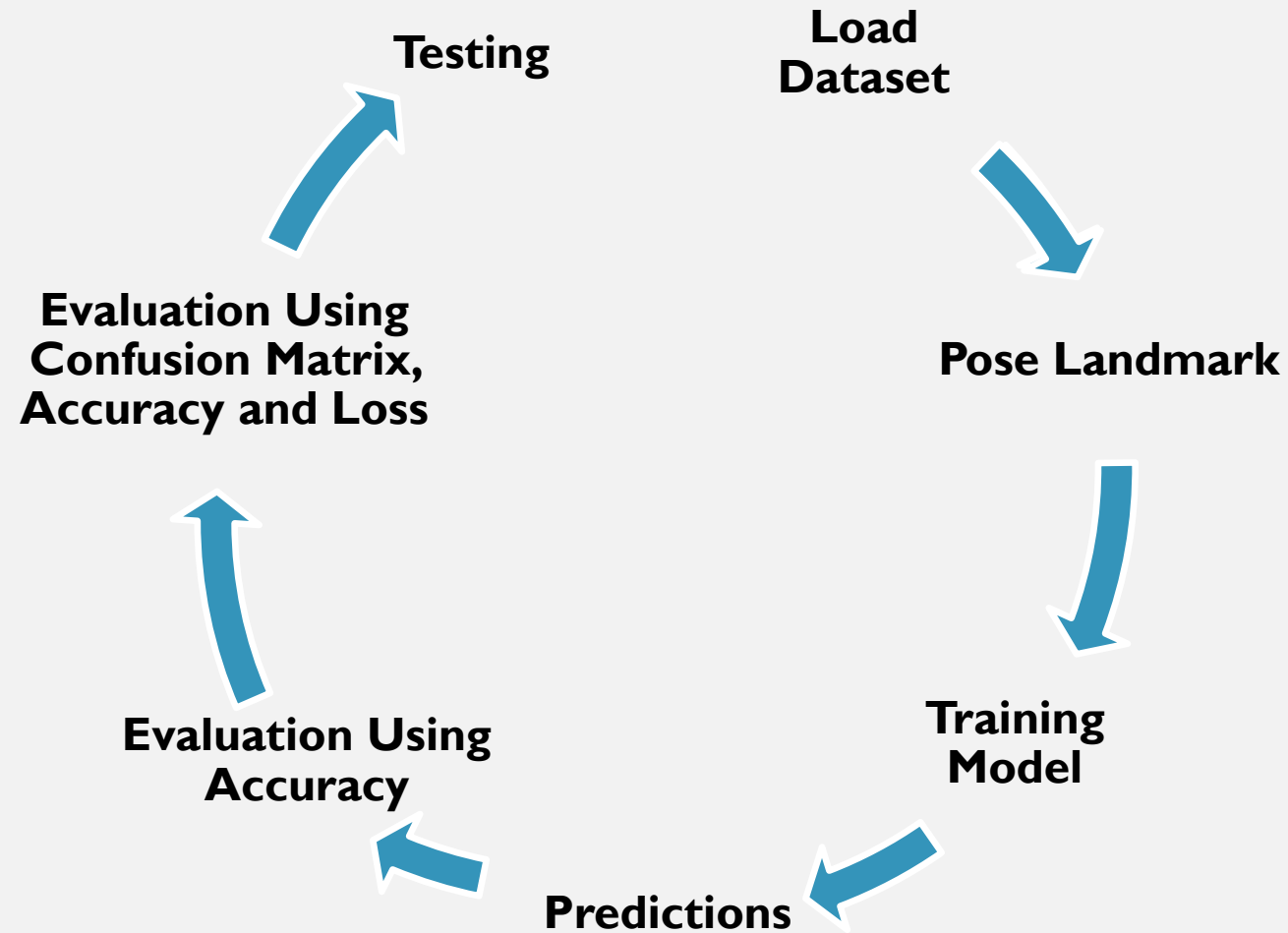
**FALSE LAT PULLDOWN**

# ARCHITECTURE



Figure 4. Steps to develop an accurate Ai coach app

# **METHODS**

- A combination of Convolutional, Max-Pooling, Dense layers is used to classify sequence

  data.

- Number of layers is 2 Convolutional, 2 Max-Pooling, 1 Flatten and 3 Dense layers

- Layer Sizes:

Convolutional  Layer 1: 64 units and kernel Size equal 3

Convolutional  Layer 2: 128 units and kernel Size equal 3

Max-Pooling  Layer 1: Pool Size equal 2

Max-Pooling  Layer 2: Pool Size equal 2

Flatten  Layer

Dense Layer 1: 256 units

Dense Layer 2: 128 units

Dense Layer 3: 200 units

# METHODS

- Activation function:

 ReLU: is used to facilitates feature learning and gradient propagation within the neural network's hidden

  layers.

 Softmax : is used to produces meaningful class probabilities at the output layer, aiding in accurate classification.

- dropout regularization is implemented to enhance the generalization capabilities of neural network architectures and prevent overfitting to the training data.

- Adam Optimization Algorithm is implemented.

- Number of epochs : 500

# RESULT

**Accuracy** was used as a measure.

The accuracy for testing yields **99%** and yields also **99%** for training.