3-Month Learning Plan: Python, NumPy, OpenCV, TensorFlow

Week 1: Python Basics

Topics:

- Functions, Loops, Lists, Dictionaries

- File I/O, Exception Handling

Evaluation:

- Task: Build a text-based calculator

- Task: Create a contact book using a dictionary

Week 2: OOP + Intermediate Python

Topics:

- Classes, Objects, Modules

- Lambda, map, filter

Evaluation:

- Task: Student result system using classes

- Task: Simulate sensor data and save to file

Week 3: NumPy + Pandas Basics

Topics:

- NumPy arrays, slicing, math

- Pandas: DataFrames, reading/filtering CSV

Evaluation:

- Task: Analyze mock weather data

- Task: Convert lists to NumPy and perform stats

Week 4: Mini Projects with Python + Pandas

Topics:

- Data logger with Matplotlib

- CSV file processing and visualization

Evaluation:

- Project: Sensor dashboard using CSV and Pandas

Week 5: OpenCV Setup + Image Basics

Topics:

- Load, save, show images

- Draw shapes, color conversions

Evaluation:

- Task: Build a simple drawing app

Week 6: Image Processing + Contours

Topics:

- Blur, threshold, edge detection

- Find and draw contours

Evaluation:

- Project: Shape/edge counter app

Week 7: Video Capture + Face Detection

Topics:

- Webcam input, real-time frames

- Haar cascades for face detection

Evaluation:

- Project: Webcam-based face detection

Week 8: OpenCV Real Projects + Masking

Topics:

- Bitwise operations

- Object tracking and masking

Evaluation:

- Project: Virtual paint app with object tracking

Week 9: TensorFlow Basics + MNIST

Topics:

- Supervised learning, neural nets
- Model creation and training

Evaluation:

- Project: MNIST digit recognizer with basic model

Week 10: Custom Image Classifier

Topics:

- Load and preprocess dataset
- Build, train, evaluate custom model

Evaluation:

- Project: Image classifier (bugs, coins, etc.)

Week 11: TensorFlow + OpenCV Integration

Topics:

- Pass OpenCV frames into TensorFlow model
- Live prediction from webcam

Evaluation:

- Project: Real-time webcam object recognizer

Week 12: Model Deployment + Final Review

Topics:

3-Month Learning Plan: Python, NumPy, OpenCV, TensorFlow

- Export model, TFLite overview

- Flask dashboard + ESP32 overview

Evaluation:

- Project: Host ML model or create final integration with OpenCV/TensorFlow