Lab 12 – Flask Laptop Price Predictor (Complete Explanation)

1. Introduction

Lab 12 focuses on creating a web-based Laptop Price Prediction Application using Flask. A trained machine-learning model is integrated with a user-friendly webpage that allows users to select laptop specifications and get an estimated price instantly.

2. app.py – Backend Logic Using Flask

The app.py file runs the entire application and connects the frontend form with the machine-learning model.

2.1 Imports

• Flask, render_template, request – for web handling
• pickle – to load the trained ML model
• numpy – to build numeric arrays for prediction

2.2 Loading the Trained Model

The file laptop_price_model.pkl contains the trained regression model, label encoders for categorical features, and the feature names used during training. If the file is missing, the app shows an error.

2.3 Home Route ('/')

Displays the main webpage (index.html) and dynamically generates dropdown lists from label encoders (e.g., Company, CPU Brand, GPU Type).

2.4 Predict Route ('/predict')

This route handles the prediction process:
1. Receives user input
2. Encodes categorical values using saved label encoders
3. Converts numeric values to float
4. Creates input array in correct feature order
5. Sends data to the ML model
6. Displays predicted price on the webpage

3. index.html – Frontend Webpage

This is the user interface where the laptop specifications are selected.

3.1 Modern UI Styling

• Uses Poppins Google Font
• Dark blue theme
• Clean container with shadow effects
• Orange Predict Price button
• Yellow highlighted result box

3.2 Input Form Structure

• Two-column grid layout
• Dropdown menus for categorical features
• Numeric input fields
• Form submits data to /predict route

3.3 Result Display Area

If prediction_text exists, the result is displayed in a styled box showing the predicted laptop price.

4. requirements.txt – Project Dependencies

The project requires the following libraries:
• flask
• numpy
• pandas
• scikit-learn

Summary

Lab 12 successfully integrates a machine-learning model, Flask backend, and modern HTML/CSS frontend. The result is a complete Laptop Price Prediction Web Application.