**Lab #4 (ML Model Deployment on Local Server) - 10 points**

The Database is attached as well. Use any decompression software (Zip, WinRAR) to unzip the attached file.

Machine Learning (ML) models can be deployed and tested using local servers instead of cloud platforms. In this lab, you will build an ML model and create a simple web interface for making predictions. You will then run the model on a **local server** using Flask.

Please take necessary screenshots of all the actions and executions at each of the steps below.

**Instructions:**

1. **Build a Machine Learning Model**
   * Use the **Fish Market Dataset**, which can be downloaded from: <https://www.kaggle.com/aungpyaeap/fish-market>
   * You can choose to solve **either**:
     + **Regression Problem** (Predict the weight of the fish)
     + **Classification Problem** (Identify the fish species)
   * Students have the freedom to select an appropriate ML model.
2. **Create a Flask API to Serve the Model**
   * Convert your trained ML model into a **Flask API**.
   * The API should accept input parameters and return predictions.
   * Save your trained model as a .pkl file and load it inside the API.
3. **Build a Frontend Interface**
   * Use **HTML and CSS** to create a simple webpage where users can input values and get predictions.
   * The webpage should be connected to the Flask backend.
4. **Run the Model on a Local Server**
   * Use Flask to **host the model locally**.
   * Run the Flask app using python app.py.
   * Test the API using **Postman or a web browser**.

**Rubrics:**

✅ **All the above steps are completed** with necessary screenshots provided. ✅ **All relevant files are included** in the submission. ✅ **README file** is provided in the GitHub repository, explaining the model. ✅ **GitHub repository link** is provided for review. ✅ **Flask app runs locally and makes predictions successfully.**

**Submission Format:**

📌 **A single Word document** including:

* Screenshots of each step (ML model, Flask API, Frontend, Local server running, Testing predictions)
* The GitHub repository link containing all the files.
* Description of the problem statement and whether a **classification or regression model** was built.

📌 **A folder containing:**

* **Jupyter Notebook** for model building.
* **Saved model file (.pkl).**
* **Flask API Python script (app.py).**
* **Dataset (CSV file).**
* **Frontend files (index.html, style.css).**

**Mandatory Screenshots to Include in the Word Document:**

📸 **Flask API running locally** (flask run command output). 📸 **Frontend page with input fields for predictions**. 📸 **Terminal showing API receiving requests and responding**. 📸 **Browser or Postman showing successful predictions**. 📸 **GitHub repository with uploaded project files**.

This updated lab ensures that all students can **run and test their ML models locally** without requiring **Heroku or any cloud platform**.