Full Stack Development

Assignment 3:

Assignment Overview

In this assignment, you will **design and implement** a small web-based system using **Python and Flask**. The goal is to apply programming logic, data handling, routing, and template rendering the same principles used in real-world full stack development.

Assignment Description

You will build a **"Student Information Portal"** using **Python and Flask** that performs the following:

Part A – Python Implementation (Backend Logic)

Write Python programs that will later support your Flask app.
Each program must include short explanations and comments.

1. Data Handling and File Management

1. Write a Python script that stores student information (name, roll_no, department, email) in a text or JSON file.
2. Implement options to:
    a. Add a new record
    b. Display all records
    c. Search for a record by roll number

2. Object-Oriented Design

1. Create a Student class with attributes and methods like display_info() and update_email().

2. Demonstrate creating multiple objects and calling class methods.

3. Exception Handling

1. Implement a try–except block to handle missing files or incorrect data format.

Part B – Flask Web Application

Now integrate your Python logic into a **Flask application**.
Your Flask app should provide a **web interface** for adding and viewing student records.

App Requirements:

1. Home Page (/)

1. Display a welcome message and navigation links:
    a. "Add Student"
    b. "View Students"

2. Add Student Page (/add)

1. A form to enter name, roll_no, department, and email.
2. On submission, data should be stored in a JSON file (reuse your Python logic).

3. View Students Page (/students)

1. Display all student records from the JSON file in a simple HTML table using Jinja2 template.

4. Bonus (Optional but encouraged):

1. Add a search feature (by roll number)
2. Show message "Student not found" if invalid roll number is entered

Folder Structure Example

```
student_portal/
│
├── app.py
├── students.json
├── templates/
│   ├── index.html
│   ├── add.html
│   └── students.html
└── static/
    └── style.css
```

Submission Requirements:

Students are required to submit their completed assignment following the instructions below:
Submit a **single PDF document** containing:

i. app.py (main Flask file)
ii. students.json (sample data file)
iii. templates/ folder (HTML files)
iv. static/ folder (if used for styling) of your project.
v. Explanation of each Python and Flask concept
vi. Screenshots of working outputs

Late submissions may result in marks deductions as per course policy.