



ITL PUBLIC SCHOOL

SUMMER ENGAGEMENT PROGRAM

COMPUTER SCIENCE (083)-XII

Topic: Functions & File Handling using Computational Thinking

Project Title

Smart Student Record Management System

Problem Statement

Schools store and manage a large amount of student information every year such as names, roll numbers, marks, and attendance records. Managing this data manually can lead to errors, loss of information, and difficulty in searching records quickly.

Your school wants to digitize this process by developing a simple software system that can efficiently manage student records.

As a young programmer, your task is to design a **Smart Student Record Management System** using Python that applies:

- Functions
- File Handling
- Computational Thinking concepts

The system should be able to:

- Store student records permanently
- Display all records
- Search specific records easily
- Organize data efficiently

Project Objectives

The project aims to help students:

- Understand real-life applications of Python programming
- Apply Computational Thinking for problem solving
- Learn the use of Functions for modular programming
- Implement File Handling for permanent data storage
- Develop logical and analytical thinking skills
- Design a menu-driven project using Python

Computational Thinking Integration

1. Decomposition

Break the project into smaller modules such as:

- Adding records
 - Viewing records
 - Searching records
 - Exiting the system
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2. Pattern Recognition

Students will identify common patterns in all data management systems:

- Data input
 - Data storage
 - Data retrieval
 - Data organization
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3. Abstraction

Identify important information to store:

- Student Name
- Roll Number
- Marks

Unnecessary details will be ignored.

4. Algorithm Design

Create:

- Algorithms
- Flowcharts
- Step-by-step logic

for each module of the project.

Project Requirements

Students must create a Python project that includes:

- ✓ **Functions**
- ✓ **File Handling**
- ✓ **Menu-Driven Program**

Example:

1. Add Record
2. View Record
3. Search Record
4. Exit

Expected Output

The project should allow the user to:

- Enter student details
- Save records permanently
- Read all saved records
- Search records using Roll Number

Project Deliverables

Students must submit:

1. Python Project File
 2. Flowchart/Algorithm
 3. Screenshots of Output
 4. Project Report
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Reflection Questions

Students must answer the following:

1. How did decomposition help in completing the project?
2. Why are functions important in Python projects?
3. Which Computational Thinking concept was most useful for you?