

# Documentation: Student Management System

## Overview

This is a console-based Student Management System written in Python. It allows users to add, view, update, and delete student records. Data is stored in a dictionary where:

- Key = Roll No (unique integer)
- Value = Dictionary containing {"name": name, "marks": marks}

## Features

1. Add Student → Add new student with validation
2. View All Students → Display list of all students
3. View Specific Student → Search student by Roll No and display details with grade
4. Update Student → Update name or marks of existing student
5. Delete Student → Remove student from records
6. Exit → Close the program

## Functions

### # input\_int(prompt)

- Takes safe integer input
- Validates only digits

### # input\_float(prompt)

- Takes float input between 0–100
- Validates proper marks range

### # input\_name(prompt)

- Takes student name input
- Removes extra spaces and validates only alphabets

### # add\_student()

- Adds student with Roll No, Name, and Marks
- Prevents duplicate Roll Nos

### # view\_students()

- Displays all students or a message if no records exist

### **# calculate\_grade(marks)**

- Returns grade based on marks:
- 80–100 → A
- 60–79 → B
- 40–59 → C
- Below 40 → Fail

### **# view\_student()**

- Searches student by Roll No
- Displays name, marks, and grade

### **# delete\_student()**

- Deletes student by Roll No if exists

### **# update\_student()**

- Updates student's name and marks with validation

### **# menu()**

- Displays main menu and navigates options

## **Example Data**

```
students = {  
101: {"name": "Ali Khan", "marks": 85},  
102: {"name": "Sara Ahmed", "marks": 72},  
103: {"name": "Bilal", "marks": 39}  
}
```

## **Program Flow**

1. Program starts with menu()
2. User selects option
3. Corresponding function executes
4. Program runs until Exit option chosen

## **Advantages**

- Strong input validation
- Prevents duplicate Roll Nos

- User-friendly messages
- Easy to extend

## **Possible Improvements**

- Save data to file or database
- Add sorting and searching features
- Create GUI or web version
- Add GPA calculation