Student Grade Report System

A **C++ console-based project** that manages student records, calculates percentages, assigns grades, and provides various update/delete functionalities. This project demonstrates dynamic memory allocation, arrays, file handling, sorting, and data manipulation in C++.

Features

- Add student records (Roll No, CS marks, Math marks, Name).
- Calculate percentage and assign grades automatically.
- Display results in a tabular format.
- Update roll numbers or marks (individual or batch).
- Sort students by percentage (ascending order).
- Delete a student's record by roll number.
- Save results to data.txt.
- Change console colors for a better UI.

Topics Covered in This Project

✔ Dynamic Memory Allocation (new, delete)
✔ Arrays & Pointers
✔ Functions & Modular Programming
✔ File Handling (ofstream)
✔ Console UI (Windows.h, system commands, Sleep)
✔ Sorting Algorithm (Bubble sort logic)
✔ Input Validation & Error Handling

How to Run

1. Clone this repository:
2. git clone https://github.com/Muneeb-techpro/student-grade-report.git
3. Open the project in **Visual Studio** or any C++ IDE.
4. Compile and run:
5. g++ main.cpp -o grade_report
6. ./grade_report

Functionality Description

1. arrayofrollnum(int* oldarr, int size)

Dynamically resizes the roll number array when adding new students.

2. array_percentage_num(int* arr_cs, int* arr_math, int size)

Calculates percentage for each student based on CS and Math marks.

3. array_grade(double* arr_percentage, int size)

Assigns grade (A, B, C, D, F) based on percentage ranges.

4. templete_display(...)

Displays student records in a formatted table (without names).

5. final_templete_display(...)

Displays **final record** (with student names) and writes to data.txt.

6. update_roll_num(int* arr_roll, int size)

Updates the roll number of a student.

7. update_cs_math(...)

Updates **marks** (CS/Math) of a single student.

8. update_all_cs_math(...)

Updates marks for **all students** in a batch.

9. sorting(...)

Sorts students by **percentage** in ascending order (with roll, marks, and grade rearranged accordingly).

10. deletion1 / deletion2 / deletion3

Delete roll numbers, percentages, or grades dynamically when a student record is removed.

11. present(...)

Checks if a roll number exists in the student records.

Sample Output

student number	roll number	cs marks	math marks	percentage	grade
student:1	101	80	90	85.0	B
student:2	102	95	92	93.5	A

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********************************************************************************************
********************************************************************************************
student number  roll number     cs marks        math mark       percentage      grade
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student:1       101             98              95              96.5            A
student:2       102             87              76              81.5            B
student:3       103             67              56              61.5            C
student:4       104             34              47              40.5            F


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if you want to perform further operation, then press Y/y or if you are not interested, then  press any other key :
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File Handling

- The latest record is always stored in **data.txt** for persistence.

Console Customization

- Choose colors (Green, Aqua, Red, Purple, White) at startup.
- Progress bar style loading animation before UI color selection.

Demonstration Videos

To provide better clarity and verification of the project, two demonstration videos have been recorded:

1. **01_Code_Overview.mp4** – Explains the complete code structure, functions, and logic used in the project.
2. **02_Functionality_Demo.mp4** – Shows the execution of the program, including testing of all functionalities.

Author

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