Student Report Card System

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Problem Statement

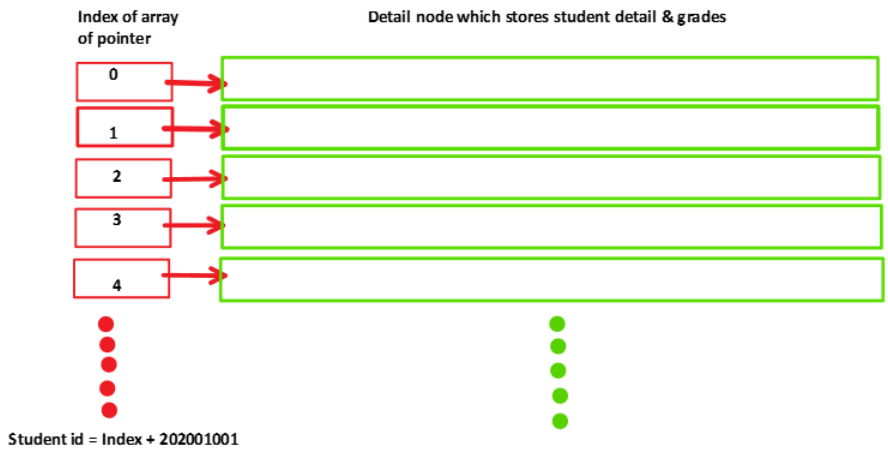
- Our project is on ***Student Report Card System***.
- Now, as the name suggests we should get all the details of a student in a table form by our project (details include grades in every subject and overall credits and grade points earned and SPI of them).
- Our project is a good way of evaluating the performance of the student throughout the semester.

Data Structures

- We have used a custom data structure for the sake of our convenience i.e., a custom detail node.
- We made a structure of data types like '*int*', '*strings*', and *'double'*.
- Like we made variable like Student ID in *'int'* and an array of *'int'* data type named Grades and made variable like student name in *'string'* data type.
- We also made variables like grade points earned by a student of *'int'* and SPI of a student of *'double'* data type.

Why we used custom Data Structure

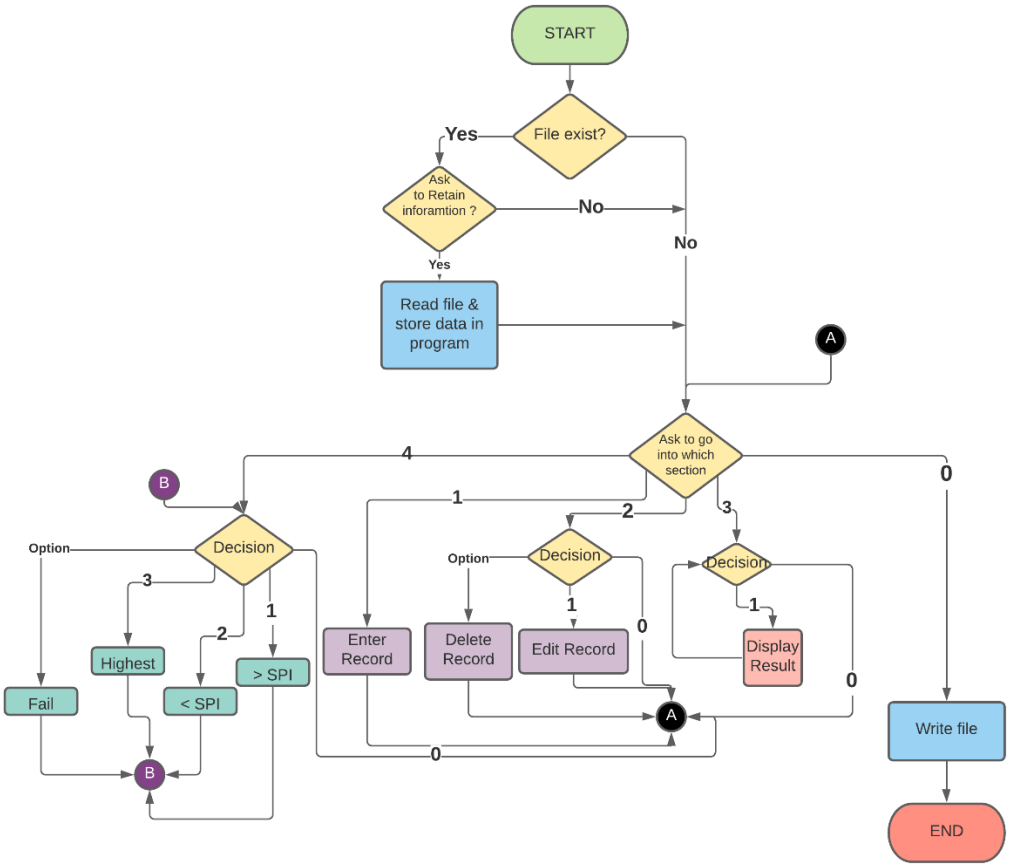
- Now, we wanted different data types as mentioned above that's why we don't use regular data structures like arrays, linked lists, queues, and stacks and rather used custom data structure.
- We made an array of pointer whose each index box points a detail node of each student.



How we approached

- We at first made a blueprint of what we wanted to be in the output produced by our code.
- Here is that blueprint:
  - The number of students
  - Subjects (fixed)
  - Name of the student and id
  - Credit hours and SPI/CPI (counted)
  - Grade's input
  - Correction of marks or grades/deletion of records (function)
  - Printing result (function)
  - Filtering students according to different criteria (function)
- We want to make the program such that navigation should become user-friendly. We want the information to store permanently that why we try to use the file handling concept.

Flow Chart



Time complexity

Function	Time Complexity
Data entry/ Edit	O(1)
Delete	O(1)
Display Result	O(1)
Read & Write file	O(n)
Filters	O(n)

Things we learned through our project

- We learned file handling i.e., how to read and write a file using c++ (in our case it is .csv file).
- We learned how to add time-lapse or say time delay so that the user can see the output and using it we made tiny animation of loading & Saving.
- We learned how to display the output in a better way as we did it in tabular form.

Limitations of our project

- The number of students has to be fixed at the start in the code itself, so we can't enter details of more students during run time when the limit is exceeded as the array is not dynamic.
- Our code maintains a record of students for a semester only so it calculates SPI only not CPI.

- The user has to manually change the file name in the code to work with a different database(Records).
- If the user says no to retain information the file will contain only data that was entered into the program. So, to continue with where they left when they last run they have to give yes.

THANK YOU

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For the Data set click here or the .zip file has it already.

The .csv file should download in the same folder in which there is the project file. And the name of the file (xyz.csv) should be there in main.cpp, read_file() & write_file() (to avoid any error or data lose.
