Pointers and virtual functions

OOP question on 17/4/26

Observation

1) Design a **Library Management System** using C++ that supports different categories of users such as students and faculty. Create a base class `Book` with attributes like title and number of days the book is issued. Derive classes `studentbook` and `facultybook` from it. Implement a **virtual function** to calculate the fine based on the number of days the book is kept, where students and faculty have different fine policies. Include functionalities to display book details and compute fines dynamically using **runtime polymorphism**.
2) Write a generic class called sorting to implement soring of any type
3) Write generic function to find minimum element in an array
4) Create a class student which inherits the features of co-curricular and extracurricular classes. In student, compute total marks based on both co-curricular and extracurricular performance. Choose the appropriate attributes and methods and use pointer to object to invoke the functions.

Execution & Spot

1. Create two string classes STRING1 and STRING2 which initialize set of characters as members and display the same. Use dynamic initialization for string initialization. Derive SUBSTRING from the two string classes, which includes subtracted characters obtained by removing the characters of STRING2 from STRING1 and display the same. Similarly, create two more classes STRING3 and STRING4 which also initialize set of characters as members and display the same, from which derive CONCATENATED class which concatenates the characters of two string classes (STRING3 and STRING4) and display the same. Compare the equality of two classes (SUBSTRING and CONCATENATED) by writing overloaded nonmember function. Write the necessary member functions and also a main function to test the above operations.

Practice question

1) write a program that accepts a shopping list of five books from the keyboard and store them in a vector and do the following on it:

   a) to add a book at specified location
   b) to add a book at end
   c) to delete a specified book in the list
   d) display the contents of the vector