Thapar Institute of Engineering and Technology, Patiala
Computer Science and Engineering Department
Lab Assignment-2

Topics:

1. Array of objects, Constructors in array of objects
2. Pointer to objects, this pointer
3. Passing and returning objects
4. Static and const member function
5. Inline function

1. Write a program to define function ***cube()*** as inline for calculating cube of a number.
2. Write a program to declare *static* public member variable, global and local variable with the same name. Initialize and display their contents.
3. Implement *static* member function using a C++ program.
4. Implement a class ***Library*** that contains **an array of *Book objects***. The ***Book*** class should have attributes like **title, author, and ISBN**. The ***Library*** class should provide following methods:
    a. **bool addNewBook(title,author,ISBN)** to add the new book in the book list. The return type should be Boolean to check whether the book is added or not. This function should take the argument using pass-by-reference method. The attribute of the class (title, author, and ISBN) and the function arguments of function **addNewBook** should be same. Use the **scope resolution operator** to access the class data members.
    b. **bool removeBooks(ISBN)** to remove the book using the input parameter ISBN. The return type should be Boolean to check whether the book is removed or not. This function also should take the argument using pass-by-reference method. Define function outside the class using scope resolution operator.
    c. **displayDetails()** to list the books.

    Write a main function to demonstrate adding, removing, and displaying books from the library. Add at least 5 books to demonstrate the adding book, 1 book to remove from the list.

5. Implement the question 1 using constructor. Do the following modification:

a. Add default constructor, parameterized constructor, and copy constructor to add the details of the book using the same parameters, i.e., **title, author, and ISBN.**
b. Use the "this" pointer instead of scope resolution operator to access the data members of the class inside the constructor and function definition.
c. Create function **bool removeBooks(ISBN)** same as the question 1**.**
d. **displayDetails()** same as question 1.
e. Create array of objects using 1. Initializer list, 2. Dynamic initialization

6. Create a class ***Account*** with attributes ***account number (of static long type), transaction ID (of long type), transaction type (credit/debit) (of string type), and balance (of double type).*** The Account class should provide following methods:
    a. **long depositAmount(to, from, amount)**. The "to" and "from" are the account number of the sender and receiver. The function should return the transaction id.
    b. **long creditAmount(to, from, amount)** similar to the depositAmount function. This function should also return the transaction id.
    c. **void displayDetails()** should display all the details such as account number, remaining balance, transaction history (credited/debited). Make this function as the const function.
    d. In all the functions, make all the arguments as the const arguments.

Write a main function to demonstrate all the function calls. Create at least 5 accounts objects (using array or without array) to demonstrate the operations of credit and debit.

Note: Use the scope resolution operator to include in-built libraries (cin, cout, endl, string etc.)

7. Write a program to add data objects of two different classes using friend functions.
8. Define a class named ***Complex*** with properties (real and imaginary) and methods as per following details.
    a. ***Parameterized constructor*** and ***copy constructor*** to initialize object values.
    b. ***void display ()*** to display complex number.
    c. ***void sum (Complex)*** to add two complex numbers (objects of Complex class). Implement this function as the friend function.

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