Part I: Advanced Programming (AP-OOAD) Lab - CSP318

Lab Assignment-3 (Introduction to C++/JAVA Concepts)

Objective: Understanding re-usability, and interface separation

**Experiment 1:**  Create a class called **Invoice** that a hardware store might use to represent an invoice for an item sold at the store. An Invoice should include four data members—**a part number** (type string), a **part description** (type string), a **quantity** of the item being purchased and a **price** per item. Your class should have a constructor that initializes the four data members. Provide a set and a get function for each data member. In addition, provide a member function named **getInvoiceAmount** that calculates the invoice amount (i.e., multiplies the quantity by the price per item), then returns the amount. If the quantity is not positive, it should be set to 0. If the price per item is not positive, it should be set to 0. Write a test program that demonstrates class Invoice’s capabilities.

**Experiment 2:** Create a class named BankAccount that Include the public member functions- **BankAccount()** constructor to initialize the account with an initial balance, **getBalance()** function to retrieve the current account balance, **deposit()** to deposit money into the account, and void **withdraw()** to withdraw money from the account.

Interface Separation:

Create a header file **BankAccount.h** that includes the class declaration (interface). Create a source file **BankAccount.cpp** that includes the class implementation and ensure that the source file implements all the member functions declared in the header file.

Client Program:

Create a C++ program named **main.cpp**. Include the **BankAccount.h** header file. In the main() function, demonstrate the use of the BankAccount class by creating an account, depositing money, withdrawing money, and displaying the account balance.

**Experiment 3:** Create a C++ class **Calculator** that consist of public member functions **Calculator()** constructor to initialize necessary variables, **add()** to add two numbers, **subtract()** for subtraction of two numbers, **multiply()** to multiply two numbers, and **divide()** for division operation (handle division by zero gracefully).

Interface Separation:

Create a header file **Calculator.h** that includes the class declaration (interface). Create a source file **Calculator.cpp** that includes the class implementation and ensure that the source file implements all the member functions declared in the header file.

Client Program:

Create a C++ program named **main.cpp** that include the **Calculator.h** header file. In the main() function, instantiate an object of the Calculator class. Demonstrate the use of each member function of the Calculator class by performing arithmetic operations.