Exercise Set 1

Please hand in your source codes to our TronClass Assignment section.

Problem 01 (25%)

Define a class **BOOK** with the following specification

- <u>Private</u> members:
  - **BOOK_NO**: (int)
  - **TITLE**: 20 characters (string)
  - **PRICE**: float (price per copy)
  - **TOTAL_COST(N)**: float (a function calculating the total cost for N copies; N is passed as argument)

- <u>Public</u> member functions:
  - **INPUT()**: Function to read BOOK_NO, TITLE, and PRICE.
  - **PURCHASE():** Function to ask the user to input the number of copies to be purchased. It invokes TOTAL_COST() and prints the total cost to be paid by the user.

Sample Input & Output

C:\CPP\book_purchase.exe

```
In INPUT():
Enter Book Title: 海大資工讚讚讚
Enter Book Number: 20240301
Enter price per copy: 999
In PURCHASE:
Enter number of copies to purchase: 10
Total cost: 9990

Process returned 0 (0x0)    execution time : 0.329 s
Press any key to continue.
```

The main function:

```cpp
int main()
{
    BOOK obj;
    obj.INPUT();
    obj.PURCHASE();
    return 0;
}
```

Problem 02 (25%)

Define a class **student** with the following specification

- Private members:
  - **studentID**: (int)
  - **name**: 20 characters (string)
  - **eng**, **math**, **phy**: float
  - **avg()**: a function to calculate the average grade of eng, math, and phy with float return type.
- Public member functions:
  - **Takedata()**: Function to accept values for studentID, name, eng, math grades and invoke avg() to calculate the average grade.
  - **Showdata()**: Function to display all the data members on the screen.
  - **PassOrFail()**: Function to display "**pass**" if the averge grade >= 60 or "**fail**". otherwise.

Sample Input & Output

C:\Users\josep_Study_Programming Language\C++\hw_2.exe

```
In Takedata()
Enter studentID: 693410001
Enter student name: 張大勇
Enter grades in English, Math, and Physics: 100 90 80
In Showdata()
StudentID:693410001
Student Name:張大勇
English:100
Math:90
Physics:80
Pass

-------------------------------
Process exited after 19.95 seconds with return value 0
請按任意鍵繼續 . . .
```

The main function:

```cpp
int main ()
{
    student obj ;
    obj.Takedata();
    obj.Showdata();
    obj.PassOrFail();
    return 0;
}
```

Problem 03 (25%)

1. Define a class named BankAccount with:
   - A private data member `balance` (double).
   - A public constructor to initialize `balance`.
   - A public function `deposit(double amount)` to add money to the balance.
   - A public function `withdraw(double amount)` to deduct money from the balance (if enough funds are available).
   - A public function `getBalance()` to return the current balance.
2. In the `main()` function:
   - Ask the user to enter an initial balance.
   - Ask the user for deposit and withdrawal amounts.
   - Display the balance before and after transactions.

Sample Input & Output

Sample input:

```
Enter initial balance: 1000
Enter deposit amount: 500
Enter withdrawal amount: 300
```

Sample output:

```
Initial Balance: $1000
Depositing $500...
Withdrawing $300...
Current Balance: $1200
```

Exercise 04 (25%)

- Create two namespaces, `CompanyA` and `CompanyB`.

- Inside `CompanyA`, define a function `printMessage()` that prints `"Welcome to Company A!"`.

- Inside `CompanyB`, define a function `printMessage()` that prints `"Welcome to Company B!"`.

- In the `main()` function, let the user select a company (A or B) and call the respective function using the correct namespace.

Sample Input & Output

Sample input:

```
Enter company choice (A or B):
A
```

Sample output:

```
Welcome to Company A!
```