Creative Software Design, Assignment 4-1

Deadline: 2024-09-25 23:59 (No score for late submission)

- Submit your homework by uploading your zip file to the LMS assignment section. Below is an example.

```
13178_Assignment1-1_2024123456.zip
├─ 1.cc
├─ 2.cc
├─ 3.cc
└─ ...
```

- Your zip file name should follow this format:
  13178_Assignment[Assignment-number]_[Student-ID].zip
  - Ex. 13178_Assignment1-1_2024123456.zip
- Source files should be named as **<filename>.cc** *or* **<filename>.cpp**
- **You must submit your solution in the zip file before the deadline.**

1. Write a C++ program to create an object of a class. The cat's age and weight are input in the `main()` function and passed to the `Cat` class. The cat information is displayed using the `showCatInfo()` function in the `Cat` class.

   A. Define a `Cat` class in C++ with the following structure:

      1. **Private members:**

         - `int _age`: Stores the cat's age (entered in the `main()` function).
         - `int _weight`: Stores the cat's weight (entered in the `main()` function).

      2. **Public members:**

         - `void showCatInfo()`: This function displays the cat's information.
         - `Cat(int age, int weight)`: This is a constructor that takes the age and weight as parameters and assigns them to the private attributes `_age` and `_weight`.

   B. Example output of your program (Bold text indicates user input):

```
Age: 5⏎
Weight: 10⏎
Age: 5 months
Weight: 10kg
```

   C. Submission file: one C++ source file (File name: 1.**cc** or 1.**cpp**)

2. Write a C++ program that calculates the amount of fuel needed based on the flight information. After registering the flight information, the program should display both the flight and fuel information.

A. Define a `Flight` class in C++ with the following structure:

1. **Private Members:**

- `string flightNum`: Stores the flight number.
- `string flightDep`: Stores the departure location.
- `string flightDes`: Stores the destination.
- `float dis`: Stores the distance of the flight.
- `float fuel`: Stores the fuel amount.
- `float calFuel()`: A member function that calculates the fuel needed based on the distance using the following criteria:

Distance	Fuel
≤ 1000	500
$1000 < x \leq 2000$	1500
> 2000	3000

2. **Public Members:**

- `void flightInfo()`: This function allows the user to input values for the flight number, departure, destination, and distance. It also calls the calFuel() function to calculate the fuel based on the distance.
- `void showFlightInfo()`: This function displays all the flight information, including the calculated fuel amount.

B. Additional Requirements:

1. Use the same variable and function names as described in the problem.
2. Ensure that the distance (dis) is greater than 100. If not, the program should print a warning and prompt the user for new input.
3. Do not use the CString function

C. Example output of your program (Bold text indicates user input):

```
Flight number: A205F12⏎
Departure: Korea⏎
Destination: Boracay⏎
Distance: 2918⏎

**Flight Information**
Flight number: A205F12
Departure / Destination: Korea / Boracay
Distance: 2918 Km
Fuel: 3000
```

D. Submission file: one C++ source file (File name: 2.**cc** or 2.**cpp**)

3. Write a C++ program to register student information. The student information includes the student's name, major, and student ID. These values are entered in the `main()` function and stored in private variables in the `Student` class using setter functions. The information is then displayed using the `showStudentInfo()` function.

   Review: **Two Ways to Define a Member Function in a Class**

   1. **Inside the Class Definition:**

```
class Student {
private:
    string name;
public:
    void setName(string name) {
        this->name = name;  // Function defined inside the class
    }
};
```

   2. **Outside the Class Definition:**

```
class Student {
private:
    string name;
public:
    void setName(string name);  // Function declared inside the class
};

// Function definition outside the class
void Student::setName(string name) {
    this->name = name;
}
```

A. Define a `Student` class in C++ with the following structure:

   1. To implement the `Student` class, define member functions **OUTSIDE the class definition.**
   2. **Private Members:**
      - `string _name`: Stores the student's name.
      - `string _major`: Stores the student's major.
      - `string _studentID`: Stores the student's student ID.
   3. **Public Members:**
      - `Student()`: Declare a constructor to initialize the student attributes.
      - `void setName(string name)`: A function to set the student's name.
      - `void setMajor(string major)`: A function to set the student's major.

- `void setStudentID(string studentID)` : A function to set the student's student ID.
- `void showStudentInfo()` : A function to display the student's information.

B. Define the main() function as follows:

- Variables:
  - `string name`: Used to enter the student's name from the user.
  - `string major`: Used to enter the student's major from the user.
  - `string studentID`: Used to enter the student's ID from the user.

C. Additional Requirements:

1. Use the same variable and function names as shown in the problem.
2. Do not use the CString function.

D. Example output of your program (Bold text indicates user input):

```
Name: Gildong Hong⏎
Major: Computer*Software⏎
StudentID: 2024000001⏎

Gildong Hong / Computer*Software / 2024000001
```

E. Submission file: one C++ source file (File name: 3.**cc** or 3.**cpp**)