ET-580 – Classes - Homework

Reading

1) Chapter 7.1, 7.2 (Constructors and Other Tools)

Implementation

1. Implement a Student class.

   a. Implement a class *Student* with the following private data members:
      1. name
      2. exam_1 grade
      3. exam_2 grade

   b. Implement all accessors and mutators

   c. Implement a private *calcGPA()* function that does the following:
      1. calculate and returns the student GPA based upon exam_1 and exam_2

   e. Implement a public *getGrade()* function that does the following:
      1. calls *calcGPA()* to obtain the student GPA
      2. returns a letter grade based upon the numerical GPA value
         90 to 100 return 'A'
         80 to 90 return 'B'
         70 to 80 return 'C'
         60 to 70 return 'D'
         0 to 60 return 'F'

   f. Test all class functions from the main function

2. Using the *Student* class from problem 1 implement the following:

   a. Implement a partially-filled array of type *Student* named *students* of capacity 10.

   b. Implement a non-member *addStudent()* function that:
      1. Creates a new *Student* object with data from function parameters
      2. Adds the new *Student* object to the *Students* array

   c. Implement a non-member *output()* function that:
      1. Outputs all *Student* data in the *Students* array as displayed in the output example (see next page)

   d. Main should use the *addStudent* and *output* functions to create five students and display their content to the console (see next page)

Example Output

```
Name: Amy
Exam 1: 95
Exam 2: 90
GPA: A

Name: Bob
Exam 1: 74
Exam 2: 63
GPA: D

Name: Charlie
Exam 1: 86
Exam 2: 80
GPA: B

Name: Daisy
Exam 1: 75
Exam 2: 99
GPA: B

Name: Edward
Exam 1: 24
Exam 2: 66
GPA: F
```