OBJECT ORIENTED PROGRAMMING 1 LABORATORY
Experiment # 5:
Classes II

QUESTIONS

We have examined a GradeBook class example in the last experiment. We have implemented GradeBook class by separating class definition (in other words interface), class implementation and driver program which contains main function [1].

1) Modify GradeBook class as follows:

a) Define a **public static const integer** data member students and initialize it to 10.
b) Define an integer array that stores students' grades (i.e int grades[students]) as private data member.
c) The class's constructor has two parameters: the coursename and an array of grades. In the constructor initialize coursename by using setCoursename function and initialize grades array.
d) Include *getMinimum* private member function which receives nothing and returns minimum grade (**Hint:** You can get help from your textbook at pages 289 [1]).
e) Include *getMaximum* private member function which receives nothing and returns maximum grade (**Hint:** You can get help from your textbook at pages 289 [1]).
f) Include *getAverage* private member function which receives nothing and returns average grade (**Hint:** You can get help from your textbook at pages 289 [1]).
g) Include *outputBarChart* private member function which receives nothing and returns nothing. In the function, display grade distribution as bar chart. You can use asterisk character to print bar (**Hint:** You can get help from your textbook at pages 290 [1]).
h) Include *outputGrades* private member function which receives nothing and returns nothing. In the function, print the contents of the grades array (**Hint:** You can get help from your textbook at pages 290 [1]).
i) Include *processGrades* public member function which receives nothing and returns nothing. In the function, call *outputGrades*, display class average, minimum and maximum grades. Lastly, call *outputBarChart* (**Hint:** You can get help from your textbook at pages 288 [1]).
j) In driver program, define an integer array and initialize it such that each element must contain a number in range [0, 100] randomly. Create a GradeBook object and call displayMessage and processGrades functions.

2) Extend GradeBook class which is written in Question 1 for 2D array version.
3) Draw UML Class Diagram for resulting class by using Visio.

[1] Paul Deitel and Harvey Deitel, "C++ How To Program", Eighth Edition, Prentice Hall, 2012.