TOBB University of Economics and Technology
Department of Computer Engineering

BİL141Computer Programming (Java)
Spring 2016

Homework 3

Due by Feb 9 (Tuesday) 24:00

Subject: Classes and Methods

1) Define a class called **Counter**. An object of this class is used to count things, so it records a count that is a nonnegative whole number. Include methods to set the counter to 0, to increase the count by 1, and to decrease the count by 1. Be sure that no method allows the value of the counter to become negative. Also include an accessor method that returns the current count value, as well as a method that displays the count on the screen. Do not define an input method. The only method that can set the counter is the one that sets it to zero. Write a program to test your class definition. (*Hint*: You need only one instance variable.)

2) Create a class that represents a grade distribution for a given course. Write methods to perform the following tasks:

- Set the number of each of the letter grades A, B, C, D and F.
- Read the number of each of the letter grades A, B, C, D and F.
- Return the total number of grades.
- Return the percentage of each letter grade as a whole number between 0 and 100, inclusive.
- Draw a bar graph of the grade distribution.

The graph will have five bars, one per grade. Each bar can be a horizontal row of asterisks, such that the number of asterisks in a row is proportionate to the percentage of grades in each category. Let one asterisk represent 2 percent, so 50 asterisks correspond to 100 percent. Mark the horizontal axis at 10 percent increments from 0 to 100 percent, and label each line with its letter grade.

For example, if the grades are 1 A, 4 Bs, 6 Cs, 2 Ds and 1 F, the total number of grades is 14, the percentage of As is 7, the percentage of Bs is 29, the percentage of Cs is 43, the percentage of Ds is 14 and the percentage of Fs is 7. The A row would contain 4 asterisks (7 percent of 50 rounded to the nearest integer), the B row 14, the C row 21, the D row 7, the F row 4. The graph would look like this:

```
0    10   20   30   40   50   60   70   80   90  100
|    |    |    |    |    |    |    |    |    |   |
**************************************************
**** A
************** B
********************** C
******* D
**** F
```

In each program have the following comments at the top.

```
/*
 * BİL141 Spring 2016
 * HW#
 *
 * NameOfTheProgram (ex: GradeCalculator)
 * Explanation (ex: Given a number of grades (0-100),
 * Counts the number of letter grades)
 *
 * @author          FirstnameLastname (Student number)
 * @email  ....@etu.edu.tr
 * @date yyyy/mm/dd
*/
```