

Trent University
COIS1020H
Winter 2022
Assignment 2
Due: February 11, 2022

You have been approached by Trent University to create a C# program to calculate the averages for students in three different departments: Computer Science, Biology, and Physics. Using a sentinel value `while` loop (not a `do-while` loop), you are to process mark data until the user indicates that you should stop (there could be 0 or more data values).

For each student processed, the program must first input the department code (`char deptCode`): 'C' or 'c' for Computer Science, 'B' or 'b' for Biology, and 'P' or 'p' for Physics. The program is to then input a mark (`double markVal`) ... the mark should be validated to ensure a value which is greater than or equal to 0 but less than or equal to 100 (you can use a `do-while` loop to validate the mark).

The program is to stop accepting input when the user enters a 'Q' or 'q' for department code (sentinel value). The program should not prompt for a mark after the quit has entered. Your main loop should be conditioned on the fact that the user has not signalled quit. It might look something like:

```
while(char.ToUpper(deptCode) != 'Q')
```

This implies that, like any sentinel value loop, you must seed the loop (input a department code) PRIOR to entering the loop. Inside the loop the mark data is entered (and validated), processed and another department code entered. Once the main loop terminates (user enters a 'Q' or 'q'), the averages for the 3 departments are to be computed and printed out. Be sure to print an error message if the user enters an invalid department code. Also, take care as to not divide by 0!

Here is sample output of what you might see:

```
Enter a department code: 'C' or 'c' for Computer Science, 'B' or 'b' for History, 'P' or 'p' for Physics, or enter 'Q' or 'q' to quit => C
Enter the mark (>= 0 or <= 100) => 91
Enter a department code: 'C' or 'c' for Computer Science, 'B' or 'b' for History, 'P' or 'p' for Physics, or enter 'Q' or 'q' to quit => b
Enter the mark (>= 0 or <= 100) => 85.2
Enter a department code: 'C' or 'c' for Computer Science, 'B' or 'b' for History, 'P' or 'p' for Physics, or enter 'Q' or 'q' to quit => P
Enter the mark (>= 0 or <= 100) => 70
Enter a department code: 'C' or 'c' for Computer Science, 'B' or 'b' for History, 'P' or 'p' for Physics, or enter 'Q' or 'q' to quit => p
Enter the mark (>= 0 or <= 100) => 80.0
Enter a department code: 'C' or 'c' for Computer Science, 'B' or 'b' for History, 'P' or 'p' for Physics, or enter 'Q' or 'q' to quit => c
Enter the mark (>= 0 or <= 100) => 84
```

Enter a department code: 'C' or 'c' for Computer Science, 'B' or 'b' for History, 'P' or 'p' for Physics, or enter 'Q' or 'q' to quit => q

The average for Computer Science students is 87.5

The average for Biology students is 85.2

The average for Physics students is 75.0

For this assignment, you are to submit:

1. Properly documented source code (.cs file) which includes comments at the top of your program (containing your name, student number, a description of the program), the list of variable names with their uses (data dictionary), and comments within the body of your program (inline comments).
2. Sample output showing your program works using the template that is provided on BlackBoard. This is to be a PDF file that contains one screen shoot of an output window, and several more cut and pastes of sample outputs (use a word processor and then export as a PDF). Unlike Assignment 1, you will need to determine what cases need to be tested. Your job is to prove to the marker that your program works for ALL cases. One test case is not sufficient.

These 2 files are to be attached to the Assignment 2 DropBox by the due date.