CS 100 2018S Homework 03

Due: at the beginning of the class on February 8th.

Read Chapter 5. Conditionals and Recursion in the text. The sections on recursion – Recursion, Stack Diagrams for Recursive Functions, and Infinite Recursion – are optional.

Do the programming assignment below. If you run into a problem, post to Moodle describing where you ran into trouble or email your instructor or classroom assistant, or ask your question during office hours. If you know the answer to someone's question on Moodle, post a response. You get course credit for asking and answering questions in Moodle.
Submit a text file with the extension '.py' with your answers to the assigned exercises.

1. Write Python code that does the following:
   i. Assigns the values 3, 4 and 5 to the variables a, b and c, respectively.
   ii. Write an if statement that prints 'OK' if a is less than b
   iii. Write an if statement that prints 'OK' if c is less than b
   iv. Write an if statement that prints 'OK' if the sum of a and b is equal to c
   v. Write an if statement that prints 'OK' if the sum of a squared and b squared equals c squared.

2. Repeat the previous problem with the additional requirement that 'NOT OK' is printed if the condition is false. You may do this separately or amend your answer from Part 1 to include this new requirement.

3. Write a program that asks the user for a color, a line width, a line length and a shape. Assume that the user will specify a shape that is either a line, a triangle, or a square. Use turtle graphics to draw the shape that the user requests of the size, color, line width and line length that the user requests. For example, if these are the user choices for color, width, line length and shape, the blue triangle below would be correct graphical output (vertically flipped is fine)

```
what color? blue
what line width? 25
what line length? 100
line, triangle or square? Triangle
```

4. Write a program that takes input from the user in order to calculate their overall CS 100 grade. You'll need all of the information specified in the Overall Course Score Formula as well as the grade cutoffs, both in the syllabus (excerpt below for your convenience). The user will enter grades out of 100; your program must convert them to their true value (e.g. Homework is out of 10 points, so an 87 would be a 9 out of 10). You may assume the user enters a valid number for each grade.

Since we don't officially know how to set up loops yet, this solution will require some copy-pasting, since you're basically doing the same thing for each category with minor changes (i.e. how much the category is worth). Of course, if you know how to use loops and plan your solution accordingly, you are free to do so.

Hint: Don't forget to convert user input to an integer before doing any math with it!

Hint: If a user enters *rawGrade* as their grade (out of 100), and you need to convert that to an *x*-point scale (e.g. *x*=10 for Homework), use the following formula. (Don't use `round()` if you want to keep the decimal, such as for exam grades.)

```
convertedGrade = round(rawGrade * x / 100)
```

Overall Course Score Formula
Homework 10%
Attendance at office hours 4%
Midterms 1 and 2, 20% each
Final Exam 30%
Roadmap Projects 10%
Misc 6%

Grade	A	B+	B	C+	C
Total Cutoff	85	80	75	70	65
Final Cutoff	80	75	70	65	65

```
Enter grade for Homework: 86
Enter grade for Midterm 1: 70
Enter grade for Midterm 2: 82
Enter grade for Final Exam: 85
Enter grade for Roadmap: 100
Enter grade for Recitation: 100
Enter grade for Misc: 100
Overall grade: 85
You got an A!
>>>
```

```
Enter grade for Homework: 74
Enter grade for Midterm 1: 56
Enter grade for Midterm 2: 61
Enter grade for Final Exam: 59
Enter grade for Roadmap: 100
Enter grade for Recitation: 78
Enter grade for Misc: 100
Overall grade: 67
You failed the course...
>>>
```