CSCI 1310 Introduction to Programming (Experienced)
Instructor: Osborne and Graham
Assignment 3
Due Monday, February 2nd, by 14:00.

For each of the problems, generate a separate .py file with a name that identifies the problem number. Problem 1 should be called Problem1.py, Problem 2 should be called Problem2.py, Problem 3 should be called Problem3.py, and Problem 4 should be called Problem4.py.

Zip the files for each answer together and submit them to the Moodle as *FirstName_LastName_Assignment3.zip*. Please also include comments in your code to describe what your code is doing. Comments should also include your name, recitation TA, and the assignment and problem number.

Note: Your files need to be named exactly as described here, and zipped together to generate a .zip file, or points will be deducted from your grade. The print statements requested in each question should also be formatted exactly as described.

Problems:

1. In football, there is a statistic for quarterbacks called the *passer rating*. There are five input parameters to the calculation: pass completions, pass attempts, total passing yards, touchdowns, and interceptions.
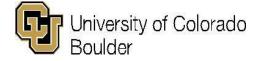
   Write a program that prompts the user to enter the five values below for a particular quarterback:
   - i.   Pass completions
   - ii. Pass attempts
   - iii. Total passing yards
   - iv. Touchdowns
   - v.   Interceptions

   Your five arguments should then be used in the passer rating calculation as follows:
   - vi.   C = (completions per attempt – 0.30) * 5
   - vii. Y = (yards per attempt – 3) * 0.25
   - viii. T = touchdowns per attempt * 20
   - ix.   I = 2.375 – (Intercepts per attempt * 25)
   - x.   PasserRating = (C+Y+T+I)/6*100

   Your program should then output the passer rating in the following print statement: "*The passer rating is X*", where *X* is the number calculated for PasserRating. (*Note: you will get weird numbers if you input fake data.*

However, if you use data from nfl.com or espn.com, you should get the same result for passer rating as these websites.)

2. This question builds on the calculations in Problem 1. Once you have Problem 1 working, create another file called Problem2.py and copy your code from Problem 1 into this file. Modify your code to include an evaluation of the passer rating. A rating is "poor" if it is 85 or below, "mediocre" if above 85, "good" if above 90, and "great" if above 95. Modify your Problem 1 code to output not only the passer rating, but also whether the rating is "poor", "mediocre", "good", or "great". For example, a print statement for a passer rating of 65 would look like: "*Rating 65, this is poor*".

   To test your program, look up actual data on www.nfl.com or use the following information from 2007:

Quarterback	Completions	Attempts	Yards	Touchdowns	Interceptions
D. McNabb	180	316	2647	18	6
T. Brady	319	516	3529	24	12
P. Manning	362	557	4397	31	9

3. A day has 86,400 seconds (24*60*60). Given a number in the range of 0 to 86,400, output the current time as hours, minutes, and seconds for a 24-hour clock. For example, 70,000 seconds is 19 hours, 26 minutes, and 40 seconds. Your program should prompt the user for the number of seconds to convert, and then use that number in your calculations. Your output should be displayed as "*The time is X hours, Y minutes, and Z seconds*".

4. Take one sheet of paper, and fold it in half, then fold it in half again, and again, and again. Can you fold it 30 times? Pretending that you can (you probably won't be able to fold it more than eight times), how thick would it be after 30 times? Assume the paper is 1/200 cm thick. Write a program to solve this puzzle. Your program should prompt the user for a single input, which is the number of folds. The program should display the thickness of the paper in centimeters in the following way: "*The thickness after X folds will be Y cm*". (There are several, equally correct, ways to solve this problem. To recognize the pattern, you may want to write out by hand the answer for 0,1,2,3,4,5,6,…n folds, and remember that computers operate using powers of 2.)

University of Colorado Boulder