

ITI 1120 - Assignment 2

Instructions

This assignment is to be done **INDIVIDUALLY**.

You have been provided with skeletons for each of the questions (hw2q1.py, ..., hw2q4.py). Please complete them, then zip them in a file hw2.zip and submit it in Brightspace.

Note:

a) Your program **MUST** run without syntax errors. In particular, when grading your assignment, TAs will first open your files with IDLE and press Run Module. If pressing Run Module causes any syntax error, the grade for the whole assignment will be zero.

b) Please don't modify any headers. If you do, all points related to that question or sub-question will be deducted.

Question 1 Implement a Python function to calculate the body mass index (BMI). In the main part of the program, ask the user to input the weight in kilograms and the height in meters and call the function. Based on the value returned by the function, print a message describing the result ("underweight" if $BMI < 18.5$, "normal weight" if $18.5 \leq BMI < 25$, "overweight" if $25 \leq BMI < 30$, and "obese" if $BMI \geq 30$).

Question 2 Implement a Python function that prints integers from a to b. The main part of the program should ask the user to input a and b and call the function.

Question 3 Suppose you are asked to design a software tool that helps an elementary school student learn arithmetic operations. The software allows the student to select the arithmetic operation she or he wishes to study. The student chooses from a menu one of two arithmetic operations: Addition and Multiplication. Based on the student choice, the software tests the user with exactly 10 questions. For each question, two random positive one-digit integers are generated; then the student is asked to enter the answer for the arithmetic operation applied to the two numbers.

The software displays the number of correct answers and the message "Congratulations!" if more than 6 questions are answered correctly, otherwise, the program should display "Please ask your teacher for help".

- a) Implement a Python function to execute the arithmetic test for a student for multiplication or addition operations. The function receives as parameter an integer that represents the required operation (1 for multiplication and 0 for addition). Then it gets the student to answer 10 questions as follows:

- a. Randomly generates two positive one-digit integers.
- b. Ask the student to enter the answer for the arithmetic operation of the two numbers,
- c. Checks if the result is correct. If the answer is incorrect, it provides the correct answer.

As questions are answered, the correct answers are counted. The number of correct answers is returned by the function.

- b) Implement the main part of the program to interact with the student to obtain the choice for either multiplication or addition, then call the function developed in part (a) to test the student (recall that the function returns the number of correct answers). Then print the number of correct answers, followed by one of two possible messages ("Congratulations!" or "Please ask your teacher for help", depending on whether the student gets more than 6 correct answers or not).

Question 4 Modify your Python program from Q1 so that the user is tested with 10 questions that are randomly distributed between multiplication and addition. It should also provide the correct answer for the questions that were answered incorrectly. The modifications are as follows:

- a) Modify the function to receive an integer representing the required operation (1 for multiplication or 0 for addition), then generate two random numbers, and returns true if the user has answered the question correctly and false if not.
- b) Modify the main part of the program to generate a random integer (0 or 1) value representing one of the two operations and send the Boolean value to the function to perform the test (note that the program should call the function 10 times, once for each question). Then the program counts the number of correct answers and prints it, followed by one of two possible messages to the student ("Congratulations!" or "Please ask your teacher for help", depending on whether the student gets more than 6 correct answers or not).