**CS161  
Assignment 02  
Due Tuesday 10/11/22**

**Name:**

**Student ID (X-number):**

### Assignment Format (20 points)

In this assignment, please answer question 4 and 5 by the end of this document; you will also create three Python programs, named ***bmi\_1.py, bmi\_2.py***, and ***perfect\_square.py***, respectively.

1. Please save this document as a new copy, named **assignment02\_initials** (e.g. assignment02\_nw) in a folder named **cs161\_assignment02\_initials** under your **.../CS161/Week02** directory.
2. Don’t forget to add your name and student ID at the top of newly saved Word document.
3. Answer questions 4 and 5 and save the changes.
4. For the python programs (*bmi\_1.py, bmi\_2.py, and perfect\_square.py*), please put them in the same folder as the Word document – **cs161\_assignment02\_initials**.
5. In each Python program, include a docstring at the top of the program that contains:
   1. File name.
   2. Author name.
   3. Date completed.
   4. Briefly explain what the program does.

Example:

"""File: program\_name.py

Author: Harry Potter

Date completed: 01/02/2030

Description: what does this program do?

"""

1. Compressed the **cs161\_assignment02\_initials** folder in **ZIP** format, and upload the zipped folder to Moodle.

NOTE:

* [Zip and unzip files/folders on Windows](https://support.microsoft.com/en-us/windows/zip-and-unzip-files-8d28fa72-f2f9-712f-67df-f80cf89fd4e5)
* [Zip and unzip files/folders on Mac](https://support.apple.com/guide/mac-help/zip-and-unzip-files-and-folders-on-mac-mchlp2528/mac)

### What to Do for this Assignment?

**Programming Exercise**

1. **bmi\_1.py** (name the program ***bmi\_1.py*** and save it under your ***…/CS161/Week02 directory***.)

Body mass index (BMI) is a number calculated from a person’s weight and height. According to the Centers for Disease Control and Prevention, the BMI is a fairly reliable indicator of body fatness for most people. BMI does not measure body fat directly, but research has shown that BMI correlates to direct measures of body fat, such as underwater weighing and dual-energy X-ray absorptiometry. The formula for BMI is

***weight / height2***

where ***weight***is in **kilograms** and ***height***is in **meters**.

* 1. Write a program that **prompts** for **weight in pounds** and **height in inches**, **converts** the **values to metric**, and then **calculates the BMI**.

1. **bmi\_2.py** (name the program ***bmi\_2.py*** and save it under your ***…/CS161/Week02 directory***.)

Augment the previous *bmi\_1* program by printing out where that BMI fits in the CDC standard weight status categories:

|  |  |
| --- | --- |
| BMI | Weight Status |
| Below18.5 | Underweight |
| 18.5–24.9 | Normal |
| 25.0–29.9 | Overweight |
| 30.0 and above | Obese |

1. **perfect\_square.py** (name the program ***perfect\_square.py*** and save it under your ***…/CS161/Week02 directory***.)

Write a short program that will:

* 1. prompt the user for a number;
  2. print out whether the number is a perfect square;
  3. prompt the user for another number if the input was not a perfect square.

NOTE: [What is a perfect square?](https://www.mathsisfun.com/definitions/perfect-square.html)

**Short Answer**

1. **In your own words, describe what the statements *continue* and *break* do in loops.**

Your answer:

1. **Consider the Python function *range(a, b).* Label the statements below as *True* or *False*, and explain the reasons.**
   1. Value “a” is included in the range.
   2. Value “b” is included in the range.

Your answer: