CS:5110 Introduction to Informatics
Fall 2022
Homework 1

Points**: 10

Due Date: **September 6, 2022 (before the start of class)**

Goal: To get you started with working with python and writing your first program.

1.Write and test a Python program to calculate the maximum number of small rectangles that can fit into a larger rectangle.

You must ask the user for input of these sizes. For example, the user may enter length 30 inches and height 12 inches for the larger rectangle and length 3 inches and height 2 inches for the smaller rectangle. Assume that the sizes are always given in inches.

Make sure to test the program with different values.

i.   Large rectangle: Length = 648 inches, height = 200 inches.
     Small rectangle: Length = 50 inches, height = 14 inches.
ii. Large rectangle: Length = 92 inches, height = 5 inches.
     Small rectangle: Length = 4 inches, height = 2 inches.
iii. Large rectangle : Length = 6000 inches, height = 200 inches.
     Small rectangle: Length = 35 inches, height = 7 inches.

Print out informative answers with the correct units. For example: "The number of small rectangles of length W inches and height Y inches that fit into a large rectangle of length A inches and height B inches is X".

2. Given the base and the height of a right-angled triangle from a user, write a Python program to find the length of the hypotenuse i.e., the remaining side opposite the right angle. Use Pythagoras theorem[1] i.e. square of the side opposite the right angle (hypotenuse) is equal to the sum of the squares of the other two sides (base and height).

The 2 sides given are base and height and the remaining side to find is the hypotenuse.

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[1] https://en.wikipedia.org/wiki/Pythagorean_theorem

Use your program to calculate and print out the hypotenuse when the given sides are:

(i)   Base = 3 feet,   Height = 4 feet
(ii) Base = 12 feet,   Height = 5 feet
(iii) Base = 19.5 feet,   Height = 27.5 feet

Submission Instructions:

Write a single python file (.py extension) that has solutions to both problems. Separate the problems with an appropriate comment line, (e.g., # problem 1). Your file should be named <firstname>-<lastname>-hwk1.py.

Submit your solution file to the ICON Dropbox setup for this homework.