CS-UY 1114: Lab 1

IO, Types, Expressions, Operators

You must get checked out by your lab CA **prior to leaving early.** If you leave without being checked out, you will receive 0 credit for the lab.

Restrictions

The Python structures that you use in this lab should be restricted to those you have learned in lecture so far. Please check with your teaching assistants in case you are unsure whether something is or is not allowed!

If you do not have Python running on your computer please go back to Lab 0 and set it up before moving on

Create a new python file for each of the following problems.

Problem 1: Halloween Night

Every Halloween you hand out candy out to trick-o-treaters. However, you always get tired before you finish handing out all your candies so one lucky group of trick-o-treaters get the remaining candies under the following conditions:

1. Every trick-o-treater must have an **equal** amount of candy given to them (otherwise the kids will throw a fit!)
2. You must give the most amount of candy possible (any leftover candies are a snack for you later!)

The program will ask the user for **two** inputs: the amount of candies left in your candy bag and the amount of kids are in the final group of trick-o-treaters. Then, the program will output **two** outputs: the amount of candy each trick-o-treater should receive and the amount of candies you will have for yourself.

The following are examples of possible outputs:

```
How many candies do you have left? 30
How many trick-o-treaters are in the final group? 10
Each kid should receive 3 candies.
I will have 0 candies left for myself to eat later.
```

```
How many candies do you have left? 2
How many trick-o-treaters are in the final group? 4
Each kid should receive 0 candies.
I will have 2 candies left for myself to eat later.
```

Problem 2: Baking scones?

You have been wanting to bake scones and have found a recipe, but the recipe is in metric and you only have measuring cups. Let's convert the metric measures to customary measurements.

The following are the metric measures for **10 scones**:

```
75 g salted butter
350 g flour
150 ml milk
```

Here are some conversion factors you can use:

```
75 grams butter = 1/3 cup of butter
150 gram flour = 1 cup flour
100 ml milk = 1/2 cup milk
```

Your program should take user input for the number of scones they want to make and print the quantity of each ingredient in customary measurements.

Your code should output the following (disregard small floating point differences):

```
Enter the number of scone you want to make: 25
To make 25 scones use 0.8333333333333334 cups butter, 5.833333333333333
cups flour, and 1.875 cups milk
```

Problem 3: I Scream, You Scream, We All Scream for Ice Cream

The weather is still dreadfully hot and I love ice cream so lets write a program that will:

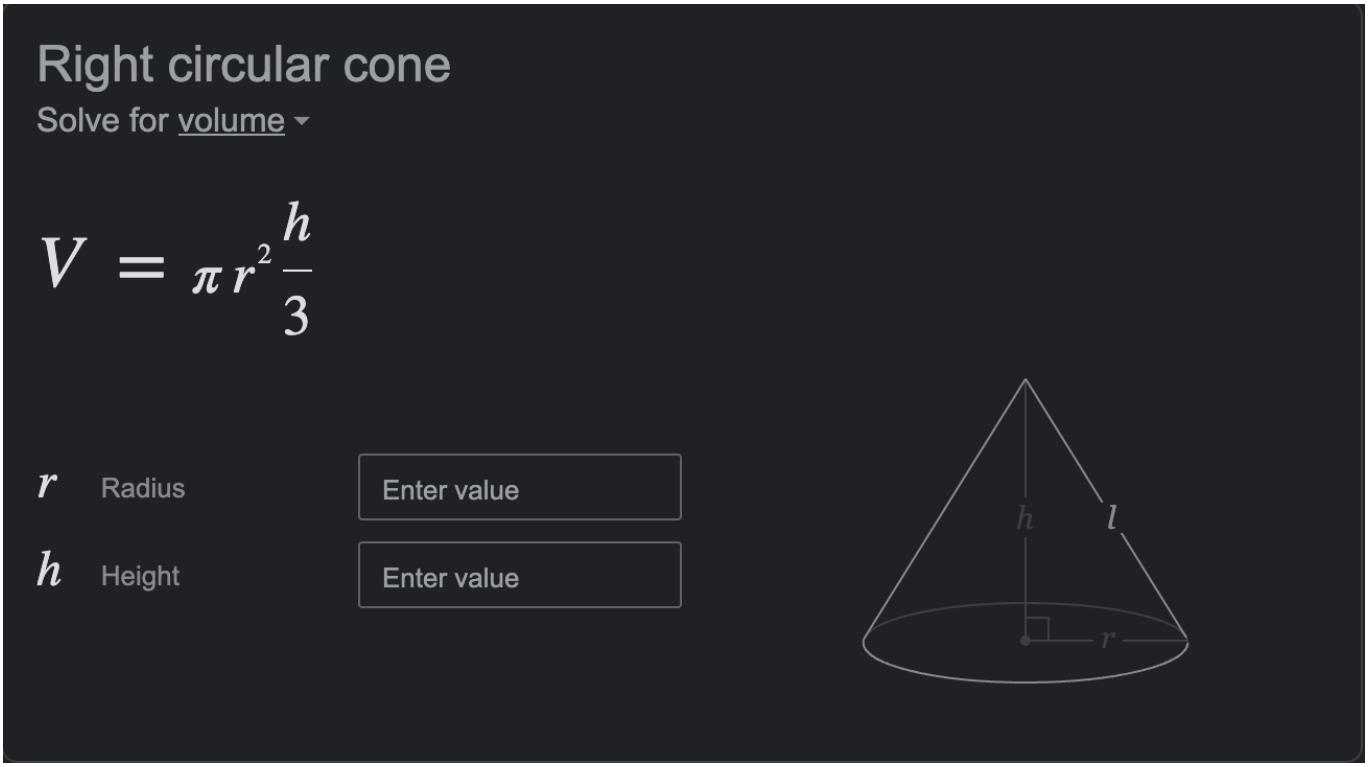
1. Take user input for number of ice cream scoops, radius of the ice cream cone, and height of the ice cream cone
2. Calculate and print the total volume of the ice cream cone. **Use 3.1416 as an approximation for PI**

We will be assuming we have perfectly spherical ice cream scoops and a perfect ice cream cone!

Look at the following image for reference on what we mean by a cone with multiple scoops.

The formula for sphere volume is as follows and will be used for each ice cream scoop:

The formula for cone volume is as follows and will be used for the ice cream cone:



Your code should output the following

```
Enter the number of ice cream scoops you want: 3
Enter the radius of ice cream cone: 3.5
Enter the height of ice cream cone: 8.9
Your 3 scoop ice cream cone has a total volume of 652.95538
```

Problem 4: Time in seconds

This program will ask the user for **four** inputs: a number of days, number of hours, number of minutes, and number of seconds. This may look something like:

```
How many days do you have?
How many hours do you have?
How many minutes do you have?
How many seconds do you have?
```

You may assume that the user will always input a positive whole number. After getting the four inputs, the function should calculate how many seconds in total are in the given number of days, hours, minutes and seconds, and output the result. The final output of the program should be something like this:

```
How many days do you have? 3
How many hours do you have? 7
How many minutes do you have? 41
How many seconds do you have? 16
3 Days 7 Hours 41 Minutes and 16 Seconds results in a total of 286876
Seconds.
```

Problem 5: When in Rome

This problem will convert a decimal number to Roman Numerals.

1. Ask the user to input a decimal integer less than 100.
2. Convert the input to Roman numbers and print to the screen.

Roman numerals and decimals follow the table below.

Decimal	Roman
1	I
5	V
10	X
50	L

For this problem there is no need to consider subtractions.
i.e., 4 = IIII, 9 = VIIII instead of IV and IX respectively.

*Hint: Use div and mod. Do **not** use conditionals to solve the problem*