**Week 1**

**Lab #1**

**Due Tuesday 10/04/22**

Here are a few problems to get us kicking off the class!

NOTE: this assignment is adapted from professor Joseph Jess’s CS161 assignment#1 (2021).

## Topics:

* Declaring variables
* Data types
* Arithmetic operations
* Getting user input
* Importing modules

## How to Submit Lab #1

1. You will need to create three Python programs: ***expressions.py***, ***todays\_date.py***, and ***voyager.py***.
2. Include a docstring at the top of each program that contains:
   1. File name.
   2. Author name.
   3. Date completed.
   4. Use 1 to 2 sentences to 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. Please leave comments throughout your program to explain what some block/line of code does, if needed. (*for learning purpose; also, this helps me see what you understand or where you may have confusions* 😊)
2. Please save those three programs in a **folder** named **cs161\_lab1\_your\_initials** (e.g., **cs161\_lab1\_nw**), under your **…/cs161c/week1** directory.
3. Compress the folder in **ZIP** format andupload the zipped folder, **cs161\_lab1\_your\_initials**, to Moodle.

NOTE: The components the instructor is looking for in this assignment mainly are completeness, correctness, readability, consistent style, and meaningful comments.

## Problem 1 – Expressions

Write the following mathematical expressions in Python, and then print out the values of **x** and **y**:



Save your program in a file called ***expressions.py*** in ***…/cs161\_lab1\_your\_initials*** folder.

## Problem 2 – Today’s Date

Python comes with hundreds of modules.

Here is a challenge for you – find a module that you can import that will generate the current day’s date and print it out.

Use your favorite search engine for help in finding which module you need and how to use it. In the end, your program is going to print out **your name** and **the current day’s date**.

See example output below:

example output of problem 2

Save your program in a file named ***todays\_date.py*** in ***…/cs161\_lab1\_your\_initials*** folder.

## Problem 3 – Voyager

The Voyager I spacecraft, launched **Sep 15, 1977**, is the farthest traveling earth-made object. It is presently on the outer edges of our solar system. The NASA update page on **Sep 25, 2009**, reported it as being a distance of approximately **16,637,000,000 miles** from the Sun, traveling away from the Sun at **38,241 miles/hour**.

Write a Python program that will:

1. Prompt the user for an **integer number** that indicates the **number of days** after **Sep 25, 2009**.
2. Calculate the **updated distance** of Voyager I from the Sun (assume that velocity is constant), based on the number of days the user enters in step 1, and print out the following calculated information to the screen:
   * Distance in **miles** from the sun.
   * Distance in **kilometers** (*1.609344 kilometers = 1 mile*) from the sun.
   * Distance in **Astronomical Units** (AU) (*92,955,887.6 miles = 1AU*) from the sun.
   * **Round-trip time** for radio communication in **hours** (*radio waves travel at the speed of light, listed at 299,792,458 meters/second***)**.

Save your program in a file named ***voyager.py*** in ***…/cs161\_lab1\_your\_initials*** folder.