CIS 122 Spring 2015
Project 1: Hello, Python
Due: Monday, April 6, 6p

Goals
By the end of this assignment, you should

- be able to open IDLE and work with the Python Shell and Editor
- understand how Python evaluates simple expressions
- be familiar with Python's numeric operators
- understand Python assignment statements
- be able to write and comment simple Python code to solve a problem

Grading Rubric
This project will be marked out of 30 points, with points given for both problem solving and Python code.

Getting Started
For this project you will be using the IDLE Python development environment. Features of IDLE, in particular, the Python Shell and Python Editor, will be introduced in lab this week.

For this project, you will enter and save Python code and other responses to the exercises given below in the Python Editor window. Before starting each problem, type a comment into the Python Editor, e.g.:

```
# Problem 0
```

The “#” symbol tells Python to ignore everything that comes after the “#” for that line.

Finishing & submitting your work
When you have completed all of the problems, use the Save command from the IDLE File menu to save the Editor window as a file with the name cis122project1.py.

To submit your project, login to Blackboard.

From the menu on the left hand side of the screen, choose "Projects". In the projects folder, choose "Submit Hello, Python". In Section 2 of the page that is displayed, scroll down to "Attach file" and choose "Browse My Computer". Locate cis122project1.py (the file you just created), and doubleclick on it. The file name will appear on an "Attached Files" list that you will see. (You need not save or submit your work from the Python Shell.)

At the bottom of Section 2, you will see a "Comments" window. This is where you credit all of the sources of any help you may have received on this assignment, including your partner if you are working in a programming pair. This is also the place to include any feedback you may have about the assignment and/or any remaining questions you may have.

Scroll down to Section 3 and hit the "Submit" button. You may re-submit your project up until the project deadline. Only the final submission will be graded.
(0)(3 pts.) You wish to buy a t-shirt as a gift for each of 10 people. Green t-shirts cost $20 each and yellow t-shirts cost $25 each. Complete the following lines of code in a Python program which will determine the total amount you must spend when 4 of the people get yellow t-shirts.

```
ttl_shirts =
ttl_yellow =
ttl_green =
ycost =
gcost =
ttl_cost =
```

Then add one more line of code: `print(ttl_cost)`.

To run the code, save the Editor window to a file named cis122project1.py. From the Run menu, choose Run Module. Print statement output is displayed in the Python Shell.

For exercises (1) and (2), predict each answer, enter the given expressions into the Python shell to confirm your answer, and then write the results as comments in the editor window:

(1)(2 pts.) What is the value of `x` after each line of the following Python code is executed?

```python
x = 5      #<you fill in the value of x>
x = x ** 3 #<you fill in the value of x>
x = x - 2  #<you fill in the value of x>
x      #<you fill in the value of x>
```

(2)(2 pts.) What is the value of `x` after each line of the following Python code is executed?

```python
x = 1      #<you fill in the value of x>
x *= 10    #<you fill in the value of x>
x += x    #<you fill in the value of x>
x      #<you fill in the value of x>
```

(3)(8 pts.) Using the Python Editor, write three assignment statements to do the following:

a) create a variable, temp, and assign it the value 0.
b) convert the value in temp from Celsius to Fahrenheit by multiplying by 9/5 and adding 32; make ftemp refer to the resulting value
c) convert the value in ftemp back to Celsius by subtracting 32 and multiplying by 5/9; make ctemp refer to the resulting value.

Check your program by adding the following statement to the end of your code:

d) print(temp, ftemp, ctemp)

Note that ctemp should have (approximately) the same value as temp after the 3 lines of code are executed.
(4)(9 pts.) "525,600 minutes" is a reference in the well-known song "Seasons of Love", from the Broadway musical Rent.

(a) What is the song title referring to? Answer in a one-line comment in the Editor window.
(b) Write 4 lines of Python code to confirm that the number in the song is correct. Determine your answer by adding a print statement and executing the code.

(5)(6 pts.) You are offered a choice: you can take $1 million dollars now, or, you can start with 1 cent and double it each day for a month. At the end of the month, you will be given the resulting amount. Write Python code to help you make a decision.

A good way to start is to look at simple cases, and try to detect a pattern.

day1_amt = .01
day2_amt = d1_amt * 2
day3_amt = d2_amt * 2

This is straightforward and clear, but tedious. Consider an alternative, which is to look for a pattern that can be exploited in the solution:

day1_amt = .01
day2_amt = d1_amt * 2
day3_amt = d1_amt * 2 * 2
day4_amt = d1_amt * 2 * 2 * 2

Do you see the pattern that allows you to write the Python code that will help you make the decision without having to have a line of code for each day of the month?

Execute your code to determine your answer. Include your answer as a comment in the Editor window.

(xc) Challenge: What if the offer were for an immediate $10 million? Include your answer as a comment in the Editor window.