

# Developers Institute

# Python Course

## Week 1

## Day 2

## Exercises

### Group Exercise – Sequences

1. Create a list containing the following sequences. Don't hard-code the sequences.
  1. 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.
  2. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.
  3. -9, -8, -7, -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4.
  4. 10, 9, 8, 7, 6, 5
  5. 1, 3, 5, 7, 9, 11, 13
  6. 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5
  7. (Bonus: 2, 4, 8, 16, 32, 64, 128)
2. Choose a motivational message (like 'Keep Calm and Carry On'). Print it 3 times – use a loop.
3. Extend the motivational message to begin with the number of times it has been printed, eg. '1. Keep Calm and Carry On', '2. Keep Calm and Carry On', etc.

### Exercise 1 – Interactive Motivator

1. Extend the simple motivational message program we worked on earlier
2. Ask the user how many times to repeat the message. Repeat it that many times. (Hint: do we need to convert to a different data type?)
3. Ask the user to type in their own motivational message, and then ask how many times to repeat the message. Make it so.

### Exercise 2 – Sequences of floating-point numbers

1. Recap – What is a float? What is the difference between an integer and a float?
2. Earlier, we tried to create a sequence of floats. Did it work?
3. Can you think of another way of generating a sequence of floats?
4. Create a list containing the sequence 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5 without hard-coding the sequence.

### Exercise 3 – Stars Again

1. Today we learned how to repeat code multiple times using a loop. Making use of **loops**, re-answer the following questions:
  1. Print a triangle of stars (10 lines tall) – bottom-heavy
  2. Print a triangle of stars (10 lines tall) – top-heavy
  3. Print two triangles of stars (10 lines tall) – facing each other
  4. Print a diamond of stars (20 lines tall)

2. Now, ask the user to supply the height of the shapes, and use that height instead of the hard-coded value we used earlier (10). Apply this user input to questions 1.1, 1.2, and 1.4 above.
3. Write a function called **print\_triangle**. It should take one argument: 'height', and print a triangle that is X lines tall, where X is 'height'. This function should not return anything.
4. Write a function called **get\_triangle\_height**. It should take no arguments. When it is run, this function should ask the user for a height for the triangle. This number should be returned at the end of the function.
5. Use the two functions you just created to create an improved answer to questions 1.1 and 1.2 above.
6. (Bonus: rename function 'get\_triangle\_height' to 'get\_shape\_height'. Now use your new functions to also create an improved answer to question 1.4 above.

#### Exercise 4 – The Guessing Game

1. Create a 'secret' number – a random integer between 1 and 100. Store it in a variable with an appropriate name.
2. Ask the user to guess the number.
3. If the user gets the correct answer, print a message of congratulations
4. If the user gets the wrong answer, print an insult (or just a message saying that s/he got it wrong...). Tell the user what the secret number was.
5. But let's be fair – the chances that the user will get the correct answer are low. So let's allow the user to have a few tries to guess the secret number.
6. Using loops, keep asking the user to guess the secret number until they guess right. (Remember not to tell the user what the number is!)
7. To help the user along, tell them if the secret number is **higher** or **lower** than the number they guessed.
8. **Test your code:** hard-code the secret number as a test, and make sure that when you type in the hard-coded number, your program runs as it should. Now change it back to a random number.
9. (Bonus: choose how many tries the user should be allowed to have. Hard-code this as a variable at the top of your script. Each time you prompt the user for an answer, also inform them how many tries they have left to guess the correct number. If the user doesn't guess the correct number after that many tries, stop asking. Simply tell them that they have lost, and tell them what the secret number was.)