EN.540.635 "Software Carpentry"

Lab 2 - Boot Camp

Skills to be addressed in the lab:

1. Booleans, integers, floats, strings
2. Lists
3. Control flow statements
4. For & while loops

Introduction: We've learned the basic Python syntax, variable types, and control statements. It's time for us to get some practice. The below are a series of challenges to complete. The final one consists of an art contest; please put your best foot forward! **As you do these exercises, make sure not to hard-code the answer. Try to make your code as robust as possible, using loops, variables, and proper control flow.**

The Challenges:

1. **Backward Numbers** - Print out numbers 1-10 in reverse order.
2. **Summing Cubes** - Given a number n, return $\Sigma_{i=1}^{n} i^3$.
3. **Palindrome Checker** - Write a function that returns true if a text string is a palindrome; false otherwise. Remember, a palindrome is a word that reads the same forward as it does backward.
4. **Don't Go Negative** - Let's code up a simple game that involves two players. The game is played like this: each player starts with 10 points. Each player takes turn rolling a fair die. If the number is even, that many points are deducted from the player's score; if the number is odd, that many points are added to the player's score. The first person to go negative loses. Print whom the winner is! Hint: you may want to (a) import the *random* class and (b) temporarily print out various turns to ensure your program is working as expected.
5. **Art Contest** - Now that you know how to use for loops, while loops, and lists; why don't we compete in an art contest? Using what you've learned, output some art into your console. Be as creative as you like. Minimize hardcoding print statements (e.g. `print(''- - - - - - - V V - - - - - - -'')`), but instead use for loops, while loops, ranges, conditionals, lists, etc (e.g. `print(i, end = ' ')`). After you've created the most exhilarating image you can, submit it to the group file, along with a **brief** *(read: bullets, incomplete sentences, succinct)* description of what coding tools were used (double for loop; nested loops; while loops; lists; type casting; etc). Make sure to include your username on the slide. We'll make an anonymous version of the powerpoint to share later; we'll use that to vote on a winner. Art example below.

Figure 1: *A Random ASCII-Ornamented Christmas Tree.* Featuring: nested for loops, type casting, random number generation. Just relies on inputting the size of the Christmas tree. Plus, different ornaments each time!