Problem Set 1

Questions taken from UTSC's course: Introduction To Computer Science I

1. What values do the following expressions return? Attempt by hand, and then evaluate it by Python.
   (a) 1 == 1
   (b) 3 == 3.0
   (c) 2 < 1
   (d) not (3 >= 2)
   (e) ((3 != 2) and (2 > 3))
   (f) (((7 > 5) and (5 >= 3) and not (4 == 5) and ((3 > 2) or (2 > 3)) and (not((3 == 9) or (4 >= 3)))) or (1 == 2))
2. Write code for the examples/documentation provided for each question. Practice the design recipe
   (a)
```
>>> doubler(2)
4
>>> doubler(-5)
-10
>>> doubler(1)
2
```
   (b)
```
>>> reverse("two")
"owt"
>>> reverse("hello")
"olleh"
>>> reverse("racecar")
"racecar"
```
   (c) Create a function that takes in a list of 5 names and returns whether or not "Richard" is one of them
   (d) Create a function that takes in a number and returns the string "Big" if it has more than 3 digits and returns "small" if it has less than 4 digits
3. Loops
   (a) my_sum = 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 + 13 + 14 + 15 + 16 + 17 + 18 + 19 + 20
   Write a loop to do the summation more efficiently
   (b) my_list = [9, 8, 7, 6, 5, 4, 3, 2, 1]
   Write a loop to print out each element on a new line
   (c) Write a function that takes in a string, `my_string`, and a single-character string, `my_char` and returns the number of times `my_char` occurs in `my_string`
   (d) Write a function that takes in a string and returns a copy of the original string with all the repeated characters removed
   (e) Write a function that takes in a string of non-negative integers separated by a space and returns the sum of the integers in the string (e.g. Input: "12 23 56", output: 91)
   (f) Write a function that takes in a list of integers and returns True if the given list of integers is in a strictly increasing order

(g) Write a function that returns the sum of all elements within an `r_list` where an `r_list` is defined as a list, where every element of the list is either an integer or another `r_list` (e.g. [1, [2, 3, 4], [5, [6], 7], [8], [], 9] is an `r_list`.