CSCA48 Exercise 5
Due: June 23, 2017. 5:00pm

1 Tree Traversal

For this exercise, we will be using the following binary tree node class:

```
class BTNode():
    def __init__(self, data, left=None, right = None):
        self.data = data
        self.left = left
        self.right = right
```

Draw the tree created by the following code[1]:

```
root = BTNode("C",
              None,
              BTNode("O",
                     BTNode("M",
                            BTNode("E")
                            ),
                     BTNode("P",
                            None,
                            BTNode("U",
                                   BTNode("T",
                                          BTNode("R",
                                                 None,
                                                 BTNode("S")
                                                 ),
                                          None
                                          ),
                                   None
                                   )
                            )
                     )
              )
```

Given that Tree, what would be the order of the nodes visited in:

1. A pre-order traversal

2. A post-order traversal

3. An in-order traversal

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[1]Double and triple check your tree... if you mess up this stage, all the rest will be wrong

2 Try again

Repeat Question 1, but this time with the following tree

```
root = BTNode("S",
            BTNode("R",
                    BTNode("E",
                            BTNode("C"),
                            BTNode("P",
                                    BTNode("M",
                                            None,
                                            BTNode("O")
                                            ),
                                    None
                                    )
                            ),
                    None
                ),
            BTNode("T",
                    None,
                    BTNode("U")
                )
            )
```

3 And the other way

Draw a binary tree[2] that would produce the following results:

- order of nodes visited in a pre-order traversal is: `M,C,O,E,U,P,T,S,R`

- order of nodes visited in a post-order traversal is: `O,C,P,T,U,R,S,E,M`

- order of nodes visited in an in-order traversal is: `C,O,M,P,U,T,E,R,S`

What to hand in

You must submit a file called `ex5.txt` with the answers to questions 1 and 2 in the following format:

```
1.1 C,O,M,P,U,T,E,R,S
1.2 S,R,E,T,U,P,M,O,C
1.3 H,I,A,N,N,A,A,N,D,B,R,I,A,N
2.1 A,B,C,D,E,F,G
2.2 T,H,E,S,E,A,R,E,N,O,T,T,H,E,C,O,R,R,E,C,T,A,N,S,W,E,R,S
2.3 H,E,L,L,O,W,O,R,L,D
```

That is, questions 1.1 - 2.3 each on their own line, starting with the question number and ending with the traversal number. One space between the question number and the traversal, no other spaces.

You do not need to submit a solution for question 3 (though you should try it).

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[2]Question: is it *a* binary tree, or *the* binary tree? Is there more than one possibility?