6.101 Recitation 10: Week 5 Recipes Intro **3/11/24**

This sheet is yours to keep!

Question 2: Write the body of the tree_sum function below:

```
def tree_sum(tree):
    """
    Given a tree return the sum of all the values found in the tree.
    """
```

```
assert tree_sum(t1) ==  3
assert tree_sum(t2) ==  21
assert tree_sum(t3) ==  178
```

Question 3: Write the body of the tree_list function below:
Is there a way you can write this function so that the result only gets sorted once no matter how large the tree is?

```
def tree_list(tree):
    """
     Given a tree return a list of all the values found in the tree
      (sorted from smallest to largest).
    """
```

```
assert tree_list(t1) ==  [3]
assert tree_list(t2) ==  [2, 3, 7, 9]
assert tree_list(t3) ==  [2, 3, 7, 9, 16, 42, 99]
```

Question 4: Write the body of the tree_depth function below:

```
def tree_depth(tree, depth):
    """
    Given a tree return a sorted list of all the values found in the tree
    at the given depth (where depth=0 represents the tree value, depth=1
    represents the child values, etc.)

    If there are no values at the given depth, return None.
    """
```

```
assert tree_depth(t1, -1) is None
assert tree_depth(t1, 0) ==  [3]
assert tree_depth(t1, 1) is None
assert tree_depth(t2, 0) == [9]
assert tree_depth(t2, 1) == [2, 3, 7]
assert tree_depth(t2, 199) is None
assert tree_depth(t3, 0) == [9]
assert tree_depth(t3, 1) == [2, 3]
assert tree_depth(t3, 2) == [16, 42, 99]
assert tree_depth(t3, 3) == [7]
```

R10 Participation Credit **Kerberos : ________________@mit.edu**

Hand this sheet in at the end of recitation to get participation credit for today.

Question 1: Write the body of the tree_max function below and fill in the blanks in the assert statements.

```
def tree_max(tree):
    """
    Given tree as a dict { 'value': number,
                           'children': list of trees },
    return the maximum value found in the tree.
    """
```

```
t1 = {'value': 3,
      'children': []}

t2 = {'value': 9,
      'children': [{'value': 2, 'children': []},
                   {'value': 3, 'children': []},
                   {'value': 7, 'children': []}]}

t3 = {'value': 9,
      'children': [{'value': 2, 'children': []},
                   {'value': 3,
                    'children': [{'value': 99, 'children': []},
                                 {'value': 16,
                                 'children': [{'value': 7, 'children': []}]},
                                 {'value': 42, 'children': []}]}]}

assert tree_max(t1) == __________

assert tree_max(t2) == __________

assert tree_max(t3) == __________
```