CS 30 Discussion 1A

2020.10.23

Welcome back to CS30 Discussion!

- Solutions of HW2 will be posted next Monday.
- The first midterm exam will be on Wednesday, October 28.
- More mid-term practices: https://codingbat.com/python/List-2.
- HW1 Grading.

Recursive Help Function.

Helper functions are useful when you want to **extend the amount of parameters/modify the parameter** that a certain function takes in.

- Am I keeping track of something at each level of recursion like a counter?
- Am I supposed to be accumulating a list or value?

List Operation

- [1,2,3] + [4,5,6] = [1,2,3,4,5,6]
- [] + [1,2,3] = [1,2,3]
- [[1,2,3]] + [[4,5,6]] = [[1,2,3], [4,5,6]]
- 0 + [1,2,3] ❌
- [1,2,3] - [1] ❌

Problem set 2

5. Given a list of integers l, return that list in reverse order

```
def reverse(l):
    if l == []:
        return []
    else:
        head = l[0]
        tail = l[1:]
        rev_tail = reverse(tail)
        return ?
```

l: [1,2,3,4]

head: 1
tail: [2,3,4]
rev_tail: [4,3,2]
target return value: [4,3,2,1]
➜ [4,3,2] + [1]
➜ rev_tail + [head]

Problem set 2

6. Given a list of integers, return a list that doubles each element **if the previous element in the list was even**. The first element in the list is never doubled.

```
def helper( l, prevIsEven ):
    if l == []:
        return []
    else:
        head = l[0]
        tail = l[1:]
        curIsEven = head % 2 == 0
        if prevIsEven:
            return [head * 2] + helper(tail, curIsEven)
        else:
            return [head] + helper(tail, curIsEven)
```

```
def doubleIfPreviousEven( l ):
    return helper(l, False)
```

Problem set 3

Please firstly work on Question 6,7,8,9 on your own.

Problem set 3

```
def mystery(l):
    if l == []:
        return []
    else:
        head = l[0]
        tail = l[1:]
    return mystery(tail) + [head]
```

```
>> mystery([1,3,5])

mystery([1,3,5])
    mystery([3,5]) + [1]
        mystery([5]) + [3]
            mystery([]) + [5]
            [] + [5]
        [5] + [3]
    [5,3] + [1]
```

Problem set 3

Please work on Question 1,4,5,10 in groups.