CSC148 Worksheet 15 Solution

Hyungmo Gu

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Question 1

a. According to docstring, *flatten([[0, -1], -2, [[-3, [-5], -7]]]))* should return

$$[0, -1, -2, -3, -5, -7]$$

b.

sublist	flatten(sublist)	Value of s at the end of the iteration
N/A	N/A	[] (initial value of a)
[0,-1]	[0,-1]	
2	2	
[[-3, [-5], -7]]	[-3,-5,-7]	

> **Correct Solution:**
>
> | sublist | flatten(sublist) | Value of s at the end of the iteration |
> |---|---|---|
> | N/A | N/A | [] (initial value of a) |
> | [0,-1] | [0,-1] | |
> | 2 | [2] | |
> | [[-3, [-5], -7]] | [-3,-5,-7] | |

c.

sublist	flatten(sublist)	Value of s at the end of the iteration
N/A	N/A	[] (initial value of a)
[0,-1]	[0,-1]	[0,-1]
2	[2]	[0,-1,2]
[[-3, [-5], -7]]	[-3,-5,-7]	[0,-1,2,-3,-5,-7]

d. Yes, the final value of s in previous problem matches the solution of [0,-1,2,-3,-5,-7] in problem 1.a.

```python
def flatten(obj: Union[int, List]) -> List[int]:
    """Return a (non-nested) list of the integers in <obj>.
    The integers are returned in the left-to-right order they appear
    in <obj>.

    >>> flatten(6)
    [6]
    >>> flatten([1, [-2, 3], -4])
    [1, -2, 3, -4]
    >>> flatten([[0, -1], -2, [[-3, [-5]]]])
    [0, -1, -2, -3, -5]
    """
    if isinstance(obj, int):
        return [obj]
    else:
        s = []
        for sublist in obj:
            s.extend(flatten(sublist))
        return s
```

Question 2

a. **Input that does NOT reveal an error:** $[1, [2, 3, [4]], 5]$

Expected output: $[1, 2, 3, 4]$

sublist	flatten(sublist)	Value of s at the end of the iteration
N/A	N/A	[] (initial value of a)
1	[1]	[1]
[2,3,[4]]	[2,3,4]	[1,2,3,4]
5	[5]	[1,2,3,4,5]

b. **Input that does reveal an error:** $[1, 2, [2, 2, 3], 4]$

Expected output: $[1, 2, 3, 4]$

sublist	flatten(sublist)	Value of s at the end of the iteration
N/A	N/A	[] (initial value of a)
1	[1]	[1]
2	[2]	[1,2]
[2,2,3]	[2,3]	[1,2,2,3]
4	[4]	[1,2,2,3,4]

Question 3

- The checking of the uniqueness of elements stops at sublist when it needs to be done a level higher.