

CSC148 Worksheet 10 Solution

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Question 1

a. The following code must be changed.

- *self._items.append(item)* in *push()* method must be changed to *self._items.insert(0,item)*
- *self._items.pop()* in *pop()* method must be changed to *self._items.pop(0)*.

```
b1 class Stack:
2     """A last-in-first-out (LIFO) stack of items.
3     Stores data in first-in, last-out order. When removing an item
    from the
4     stack, the most recently-added item is the one that is removed.
5     """
6     # === Private Attributes ===
7     # _items:
8     # The items stored in the stack. The end of the list represents
9     # the top of the stack.
10    _items: List
11
12    def __init__(self) -> None:
13        """Initialize a new empty stack.
14        """
15        self._items = []
16
17    def is_empty(self) -> bool:
18        """Return whether this stack contains no items.
19        >>> s = Stack()
20        >>> s.is_empty()
21        True
22        >>> s.push(
23        hello
24        )
25        >>> s.is_empty()
26        False
27        """
28
29        return self._items == []
30
31    def push(self, item: Any) -> None:
```

```

32         """Add a new element to the top of this stack.
33         """
34         # ===== Solution (Question 1.b) =====
35         self._items.insert(0,item)
36         # =====
37
38     def pop(self) -> Any:
39         """Remove and return the element at the top of this stack.
40         >>> s = Stack()
41         >>> s.push(
42         hello
43         )
44         >>> s.push(
45         goodbye
46         )
47         >>> s.pop()
48
49         goodbye
50
51         """
52         # ===== Solution (Question 1.b) =====
53         self._items.pop(0)
54         # =====
55

```

Listing 1: worksheet_10_q1b_solution.py

Question 2

- The following changes in docstring must be made.
 1. The line ‘The items stored in the stack. The end of the list represents the top of the stack.’ under the description of `_items` in private attribute should be changed to ‘The items stored in the stack. The end of the list represents the *bottom* of the stack.’
 2. The line ‘Add a new element to the top of this stack.’ in `push()` method must be changed to ‘Add a new element to the *bottom* of this stack.’
 3. The line ‘Remove and return the element at the top of this stack.’ in `pop()` method must be changed to ‘Remove and return the element at the *bottom* of this stack.’

Correct Solution:

- The following changes in docstring must be made.
 1. The line ‘The items stored in the stack. The end of the list represents the top of the stack.’ under the description of `_items` in private attribute should be

changed to ‘The items stored in the stack. The **front** of the list represents the **top** of the stack.’

- This is because stack is LIFO. Last element in is the first to come out.
- Last element added and removed are now at the beginning of the list.

Notes:

- Learned that the **top of the stack** means where the push and pop occurs.
- 형모야. 조금만이라도 무너지지 않고 여보에게 더 빨리 갈 수 만있다면...
- 형모야. 내 여보 있어
- 형모야. 괜찮아
- 형모야. 차분히...

Question 3

Question 4