

CSC148 Worksheet 10 Solution

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April 22, 2020

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.’

Question 3

Question 4