

## CMPSC 462 – Lab-3 (25 points)

### Stack and Queue

Due date: in 1 week

**Note:** attach screenshots of your program and results under each programming exercises. Please make sure that the screenshot is readable. Don't attach a very small screenshot image.

#### Lab Exercises:

1. Show how to implement a Queue using two stacks?

```
# first in first out
class queue():
    def __init__(self) -> None:
        self._stack_in = stack()
        self._stack_out = stack()

    def enqueue(self, item):
        self._stack_in.push(item)

    def dequeue(self):
        for _ in range(self._stack_in.size() - 1):
            self._stack_out.push(self._stack_in.pop())

        temp = self._stack_in.pop()

        for _ in range(self._stack_out.size()):
            self._stack_in.push(self._stack_out.pop())

        return temp
```

```
q = queue()
for i in range(10):
    q.enqueue(i)

for _ in range(10):
    print(f"{q.dequeue()} = {}")
```

→ Lab3 python main.py

```
q.dequeue() = 0
q.dequeue() = 1
q.dequeue() = 2
q.dequeue() = 3
q.dequeue() = 4
q.dequeue() = 5
q.dequeue() = 6
q.dequeue() = 7
q.dequeue() = 8
q.dequeue() = 9
```

2. Assume that you are not as careful programmer as you are and you frequently forget to close your brackets while you program - (, {, [. You find it difficult to find where the mistake is. Write a program that reads in a sequence of characters, and determines whether its parentheses, braces, and curly braces are "balanced." Hint: for left delimiters, push onto stack; for right delimiters, pop from stack and check whether popped element matches right delimiter.

```
def bracket_checker(string: str):
    s = stack()

    # race condition
    if len(string) == 1:
        return False

    for i in string:
        if i in ['{', '[', '(']:
            s.push(i)
        elif i in ['}', ')', ']']:
            try:
                v = s.pop()
            except IndexError:
                return False
            if (v == '{' and i != '}')\
            or (v == '[' and i != ']')\
            or (v == '(' and i != ')'):
                return False

    return True
```

```
67 print(f"{bracket_checker('[[[]]()([)]') = }")
```

PROBLEMS OUTPUT DEBUG CONSOLE JUPYTER TERMINAL

→ Lab3 python main.py

bracket\_checker('[[[]]()([)]') = False