Experiment No. 5

Name :: Mirza Zulfiqar Ali Jaffer Ali
Moodle Id :: 18102043
Roll No. :: 32
Subject :: OSTL

Code :

1) Python Data Structures ::

```
from collections import deque

def stack():
        stack = []
        while(True):
                print("""
***STACK***
1) Push
2) pop
3) Display Stack
4) Quit
""")
                choice =int(input("Enter Your choice :: "))
                if choice == 1:
                        data = int(input("Enter Element to Push on stack :: "))
                        stack.append(data)
                elif choice == 2:
                        print("{} has been removed".format(stack.pop()))

                elif choice == 3:
                        print(stack)
                elif choice == 4:
                        break
                else :
                        print("Invalid Choice !!!!")

def queue():
        q = deque()
        while(True):
                print("""
***QUEUE***
1) Insert
2) Remove from right
3) Remove from Left
4) Display Queue
5) Quit
```

```
""")
                choice =int(input("Enter Your choice :: "))
                if choice == 1:
                        data = int(input("Enter Element to insert in queue :: "))
                        q.append(data)
                elif choice == 2:
                        print("{} has been removed".format(q.pop()))
                elif choice == 3:
                        print("{} has been removed".format(q.popleft()))
                elif choice == 4:
                        print(q)
                elif choice == 5:
                        break
                else :
                        print("Invalid Choice !!!!")

def Linked_list():
        ll = deque()
        while(True):
                print("""
***LINKED LIST***
1) Insert from left
2) Insert from right
3) Insert in between
4) Remove from left
5) Remove from right
6) Display Link List
7) Quit
""")
                choice =int(input("Enter Your choice :: "))
                if choice == 1:
                        data = int(input("Enter Element to insert from left :: "))
                        ll.appendleft(data)
                elif choice == 2:
                        data = int(input("Enter Element to insert from left :: "))
                        ll.append(data)
                elif choice == 3:
                        data = int(input("Enter Element to insert in between :: "))
                        index = int(input("Enter index number of the element :: "))
                        ll.insert(index, data)
                elif choice == 4:
                        print("{} has been removed".format(ll.popleft()))
                elif choice == 5:
                        print("{} has been removed".format(ll.pop()))
                elif choice == 6:
                        print(ll)
                elif choice == 7:
                        break
                else :
                        print("Invalid Choice !!!!")
```

```
while(True):
    choice_main = int(input("""
        ****MAIN MENU****
    1) Stack
    2) Queue
    3) Linked List
    4) Quit menu
    Pick the Data Structure to work :: """))
    if choice_main == 1:
        stack()
    elif choice_main == 2:
        queue()
    elif choice_main == 3:
        Linked_list()
    else:
        break
```

Output ::

```
zulfiqar110@zulfiqar110-HP-ProBook-6470b:~$ cd Downloads/
zulfiqar110@zulfiqar110-HP-ProBook-6470b:~/Downloads$ python3 demo.py

                ****MAIN MENU****
        1) Stack
        2) Queue
        3) Linked List
        4) Quit menu
        Pick the Data Structure to work :: 1

***STACK***
1) Push
2) pop
3) Display Stack
4) Quit

Enter Your choice :: 1
Enter Element to Push on stack :: 12

***STACK***
1) Push
2) pop
3) Display Stack
4) Quit

Enter Your choice :: 1
Enter Element to Push on stack :: 23

***STACK***
1) Push
2) pop
3) Display Stack
4) Quit

Enter Your choice :: 1
Enter Element to Push on stack :: 32

***STACK***
```

```
***STACK***
1) Push
2) pop
3) Display Stack
4) Quit

Enter Your choice :: 2
32 has been removed

***STACK***
1) Push
2) pop
3) Display Stack
4) Quit

Enter Your choice :: 3
[12, 23]

***STACK***
1) Push
2) pop
3) Display Stack
4) Quit

Enter Your choice :: 3
[12, 23]

***STACK***
1) Push
2) pop
3) Display Stack
4) Quit

Enter Your choice :: 4
```

```
                ****MAIN MENU****
        1) Stack
        2) Queue
        3) Linked List
        4) Quit menu
        Pick the Data Structure to work :: 2

***QUEUE***
1) Insert
2) Remove from right
3) Remove from Left
4) Display Queue
5) Quit

Enter Your choice :: 1
Enter Element to insert in queue :: 45

***QUEUE***
1) Insert
2) Remove from right
3) Remove from Left
4) Display Queue
5) Quit

Enter Your choice :: 1
Enter Element to insert in queue :: 65

***QUEUE***
1) Insert
2) Remove from right
3) Remove from Left
4) Display Queue
5) Quit

Enter Your choice :: 1
Enter Element to insert in queue :: 32
```

```
***QUEUE***
1) Insert
2) Remove from right
3) Remove from Left
4) Display Queue
5) Quit

Enter Your choice :: 1
Enter Element to insert in queue :: 43

***QUEUE***
1) Insert
2) Remove from right
3) Remove from Left
4) Display Queue
5) Quit

Enter Your choice :: 2
43 has been removed

***QUEUE***
1) Insert
2) Remove from right
3) Remove from Left
4) Display Queue
5) Quit

Enter Your choice :: 3
45 has been removed

***QUEUE***
1) Insert
2) Remove from right
3) Remove from Left
4) Display Queue
5) Quit
```

```
***LINKED LIST***
1) Insert from left
2) Insert from right
3) Insert in between
4) Remove from left
5) Remove from right
6) Display Link List
7) Quit

Enter Your choice :: 1
Enter Element to insert from left :: 78

***LINKED LIST***
1) Insert from left
2) Insert from right
3) Insert in between
4) Remove from left
5) Remove from right
6) Display Link List
7) Quit

Enter Your choice :: 2
Enter Element to insert from left :: 67

***LINKED LIST***
1) Insert from left
2) Insert from right
3) Insert in between
4) Remove from left
5) Remove from right
6) Display Link List
7) Quit

Enter Your choice :: 3
Enter Element to insert in between :: 45
Enter index number of the element :: 3
```

```
***LINKED LIST***
1) Insert from left
2) Insert from right
3) Insert in between
4) Remove from left
5) Remove from right
6) Display Link List
7) Quit

Enter Your choice :: 4
78 has been removed

***LINKED LIST***
1) Insert from left
2) Insert from right
3) Insert in between
4) Remove from left
5) Remove from right
6) Display Link List
7) Quit

Enter Your choice :: 5
45 has been removed

***LINKED LIST***
1) Insert from left
2) Insert from right
3) Insert in between
4) Remove from left
5) Remove from right
6) Display Link List
7) Quit

Enter Your choice :: 6
deque([23, 67])
```

```
***LINKED LIST***
1) Insert from left
2) Insert from right
3) Insert in between
4) Remove from left
5) Remove from right
6) Display Link List
7) Quit

Enter Your choice :: 6
deque([23, 67])

***LINKED LIST***
1) Insert from left
2) Insert from right
3) Insert in between
4) Remove from left
5) Remove from right
6) Display Link List
7) Quit

Enter Your choice :: 7

                ****MAIN MENU****
        1) Stack
        2) Queue
        3) Linked List
        4) Quit menu
        Pick the Data Structure to work :: 4
zulfiqar110@zulfiqar110-HP-ProBook-6470b:~/Downloads$
```