Experiment No. 5

```
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
```

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""")
               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():
       II = 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/
zulfigar110@zulfigar110-HP-ProBook-6470b:~/Downloads$ python3 demo.py
                ****MAIN MENU****
        1) Stack
        2) Oueue
        3) Linked List
        4) Quit menu
        Pick the Data Structure to work :: 1
***STACK***
1) Push
2) pop
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***
1) Push
2) pop
Display Stack
4) Ouit
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) Ouit
Enter Your choice :: 4
```

```
****MAIN MENU****
        1) Stack
        2) Queue
        3) Linked List
        4) Ouit menu
        Pick the Data Structure to work :: 2
***OUEUE***
1) Însert
Remove from right
3) Remove from Left
4) Display Queue
5) Quit
Enter Your choice :: 1
Enter Element to insert in queue :: 45
***0UEUE***
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
```

```
***LINKED LIST***
***OUEUE***

    Insert from left

1) Insert
                                          Insert from right
2) Remove from right
                                          Insert in between
3) Remove from Left
                                          4) Remove from left
4) Display Oueue
                                          5) Remove from right
5) Quit
                                          6) Display Link List
                                          7) Ouit
Enter Your choice :: 1
Enter Element to insert in queue :: 43
                                          Enter Your choice :: 1
                                          Enter Element to insert from left :: 78
***OUEUE***

    Insert

                                          ***LINKED LIST***
2) Remove from right

    Insert from left

Remove from Left
                                          Insert from right
4) Display Queue
                                          3) Insert in between
5) Quit
                                          4) Remove from left
                                          Remove from right
Enter Your choice :: 2
                                          6) Display Link List
43 has been removed
                                          7) Quit
***0UEUE***
                                          Enter Your choice :: 2
1) Insert
                                          Enter Element to insert from left :: 67
2) Remove from right
Remove from Left
                                          ***LINKED LIST***
4) Display Queue

    Insert from left

5) Ouit
                                          Insert from right

 Insert in between

Enter Your choice :: 3
                                          4) Remove from left
45 has been removed
                                          Remove from right
                                          6) Display Link List
***OUEUE***
                                          7) Quit

    Insert

Remove from right
                                          Enter Your choice :: 3
Remove from Left
                                          Enter Element to insert in between :: 45
4) Display Queue
```

5) Quit

Enter index number of the element :: 3

```
***LINKED LIST***
                           ***LINKED LIST***
                           1) Insert from left
1) Insert from left
                           2) Insert from right
Insert from right
                           3) Insert in between
3) Insert in between
                           4) Remove from left
4) Remove from left
                           5) Remove from right
5) Remove from right
                           6) Display Link List
6) Display Link List
                           7) Quit
7) Quit
                           Enter Your choice :: 6
Enter Your choice :: 4
                           deque([23, 67])
78 has been removed
                           ***LINKED LIST***
***LINKED LIST***
                           1) Insert from left
1) Insert from left
                           2) Insert from right
2) Insert from right
                           3) Insert in between
3) Insert in between
                           4) Remove from left
4) Remove from left
5) Remove from right
                           5) Remove from right
                           Display Link List
6) Display Link List
                           7) Ouit
7) Quit
                           Enter Your choice :: 7
Enter Your choice :: 5
45 has been removed
                                           ****MAIN MENU****

    Stack

***LINKED LIST***
                                   2) Queue
1) Insert from left
                                   3) Linked List
2) Insert from right
3) Insert in between
                                   4) Quit menu
                                   Pick the Data Structure to work :: 4
4) Remove from left
                           zulfigar110@zulfigar110-HP-ProBook-6470b:~/Downloads$
5) Remove from right
6) Display Link List
7) Quit
```

Enter Your choice :: 6

deque([23, 67])