➢ Stack as linked list: -

- Create a class Node with instance variables data and next.
- Create a class Stack with instance variable head.
- The variable head points to the first element in the linked list.
- Define methods push and pop inside the class Stack.
- The method push adds a node at the front of the linked list.
- The method pop returns the data of the node at the front of the linked list and removes the node. It returns “stack is empty” if there are no nodes.

Program for stack as linked list: -

```
class  Node:
    def __init__(self,data):
        self.data = data
        self.next = None

class stack:
    def __init__(self):
        self.head = None

    def push(self,data):
        if self.head is None:
            self.head = Node(data)
        else:
            new_node = Node(data)
            new_node.next = self.head
            self.head = new_node

    def pop(self):
        if self.head is None:
            print("stack is empty")
        else:
            popped = self.head.data
            self.head = self.head.next
            print("Pop out data is ",popped)

    def printstack(self):
        if self.head is None:
            print("\nstackis empty")
        else:
            n = self.head
            while n is not None:
                print(n.data)
                n = n.next
stack1  = stack()
stack1.push(50)
stack1.push(60)
stack1.push(70)
stack1.pop()
stack1.printstack()
```

```
thon.exe c:/Users/tarun/Downloads/Tkinter/stackaslinkedlist.py
Pop out data is  70
60
50
```

➢ Queue as linked list: -

- Create a class Node with instance variables data and next.
- Create a class Queue with instance variables head and last.
- The variable head points to the first element in the linked list while last points to the last element.
- Define methods enqueue and dequeue inside the class Queue.
- The method enqueue adds a node at the end of the linked list.
- The method dequeue returns the data of the node at the front of the linked list and removes the node. It returns “queue is empty” if there are no nodes.

Program for queue as linked list: -

```
class  Node:
    def __init__(self,data):
        self.data = data
        self.next = None

class Queue:
    def __init__(self):
        self.head = None
        self.last = None

    def enqueue(self,data):
        if self.head is None:
            self.head = Node(data)
            self.last = self.head
        else:
            self.last.next = Node(data)
            self.last = self.last.next

    def dequeue(self):
        if self.head is None:
            print("queue is empty")
        else:
            data1= self.head.data
            self.head = self.head.next
            print("dequeue data is ",data1)

    def printqueue(self):
        if self.head is None:
            print("\nqueue is empty")
        else:
            n = self.head
            while n is not None:
                print(n.data)
                n = n.next

queue1 = Queue()
queue1.enqueue(50)
queue1.enqueue(60)
queue1.enqueue(70)
queue1.dequeue()
queue1.printqueue()
```

```
thon.exe c:/Users/tarun/Downloads/Tkinter/queueaslinkedlist.py
dequeue data is  50
60
70
```