Homework 2

CSE 274
Deadline: 09/21/2022

In the `Application.java`, a class `StackI` is provided which can be used to create a stack data structure that stores data elements of type `int`. Erase the body of the `main` method, copy the following lines of code into the body of the `main` method, run the application and make sure that you see the expected output:

```
StackI theStack=new StackI(10);
theStack.push(11);
theStack.push(22);
theStack.push(33);
theStack.push(44);
theStack.push(55);
theStack.push(66);

while(!theStack.isEmpty())
System.out.println(theStack.pop());
```

The expected output is printed below:

```
66
55
44
33
22
11
```

One limitation of the developed `StackI` class is that, the size of the stack that `StackI` class creates is fixed and needs to be set when creating the stack. The cause of this limitation is that the `Stack` class uses arrays for creating stacks. To overcome this limitation, we develop a new class `StackLinkedList` which creates stacks using singly linked lists.

A draft of the `LinkList` class is provided in the `Application.java` file. Develop the following methods for the `LinkList` class:

```
public boolean isEmpty()
```

and

```
public Link deleteFirstandSendItBack()
```

The `isEmpty()` method gives `true` as the output when the linked list is empty, and gives `false` as the output when the linked list is not empty. The `deleteFirstandSendItBack` method deletes the first link of the linked list, and `return` back the deleted link as an output.

After developing the above methods, develop a class `StackLinkedList` which uses the class `LinkList` to create a stack that stores data elements of type `int`. For the `StackLinkedList` class, develop the following methods:

```
public void push(int j)
```

and

```
public int pop()
```

and

```
public boolean isEmpty()
```

As a test, erase the body of the `main` method, copy the following lines of code into the body of the `main` method, run the application and make sure that you see the expected output:

```
StackLinkedList theStack =new StackLinkedList();
theStack.push(11);
theStack.push(22);
theStack.push(33);
theStack.push(44);
theStack.push(55);
theStack.push(66);

while(!theStack.isEmpty())
System.out.println(theStack.pop());
```

The expected output is printed below:

```
66
55
44
33
22
11
```

When submitting the edited `Application.java` file, keep the above lines of code in the body of the `main` method.