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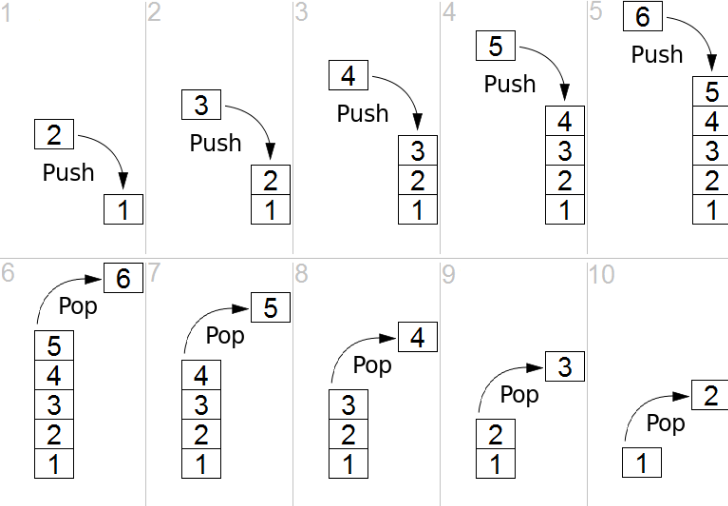
# **What Is a Stack ?**

A Stack Is an Abstraction Data Structures Based On LIFO Principle ( Last in First Out ).

You can think of the stack data structure as Stack of plates.

you can only take a plate from the top of the stack, and you can only add a plate to the top of the stack.





# LIFO Principle :

**Stack allows all operations to occur at Only One Side.**

LIFO Mean :

Last Element Inserted Must Be The First Element To Remove.

Stack Operations:

1. Push : Insert Element At The Top Of Stack.
2. Pop : Delete Element At The Top Of Stack.
3. Peek : Return Element At The Top Of Stack Without Deleting.

# **What Is Meant By Abstraction Data Structure ?**

In General Abstraction Term Mean Define What ,, But Not Defined How .

Abstraction Data Structure is The Data Structure Which Described By Its Behavior Or Operations And Can Be Implemented By Different Data Structures.

Example : Stack Can Be Implemented By Array Or LinkedList.

But in Both Cases We Must Apply The LIFO Principle.

So What ?

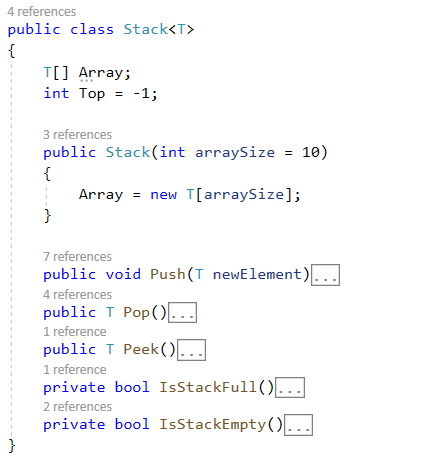
→ Build Stack Based On LIFO Principle.

How ?

→ Stack Can Implemented By Array Or Linked List.

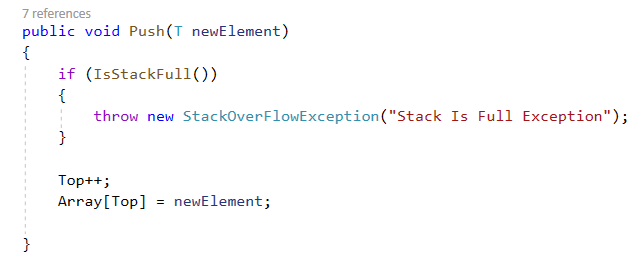
# **Stack Using Array**

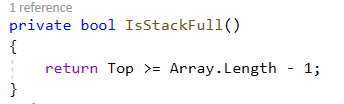
## 1.Stack Class Structure And Code :



## 2.Push Operation :

### 2.1 Code :

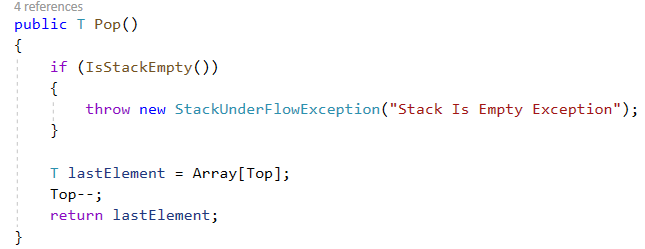


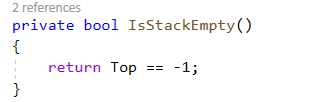


### 2.2 Time Complexity = 1

## 3.Pop Operation :

### 3.1 Code :

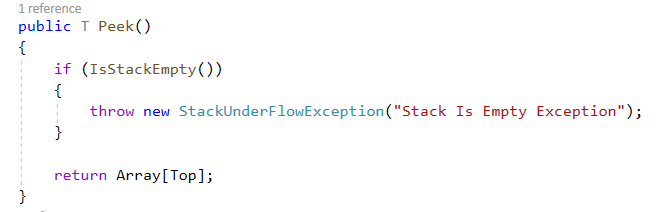


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### 3.2 Time Complexity = 1

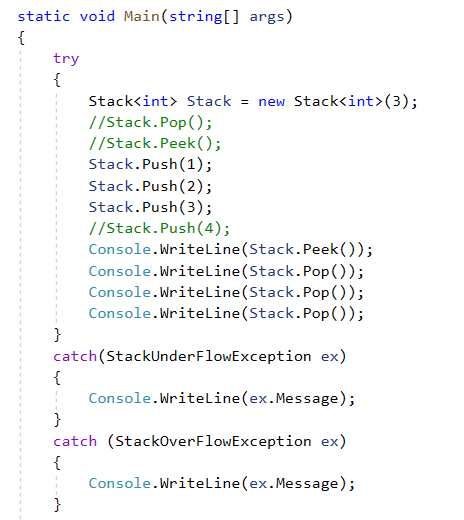
## 4.Peek Operation :

### 4.1 Code :



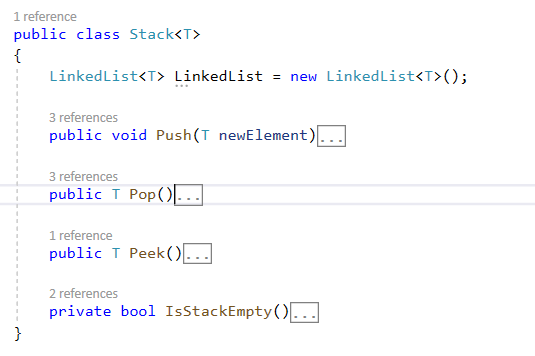
### 4.2 Time Complexity = 1

## 5.Example :



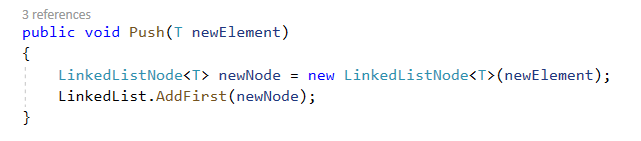
# **Stack Using LinkedList**

## 1.Stack Class Structure And Code :



## 2.Push Operation :

### 2.1 Code :



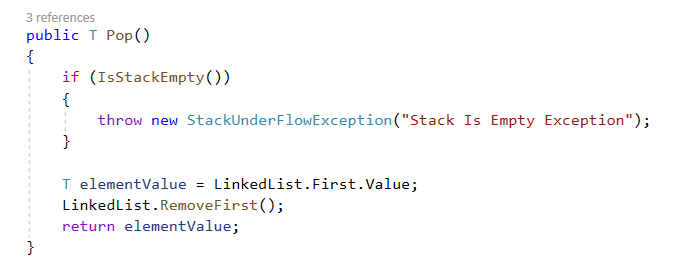
### 2.2 Time Complexity = 1

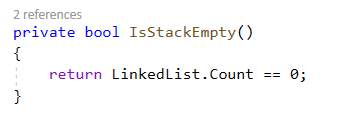
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## 3.Pop Operation :

### 3.1 Code :

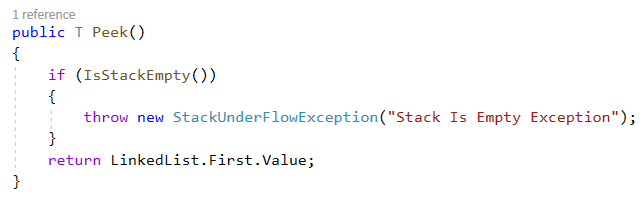
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### 3.2 Time Complexity = 1

## 4.Peek Operation :

### 4.1 Code :



### 4.2 Time Complexity = 1

## 5.Example :

