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Array Implementation of Stack

Below is the implementation of Stack using Array. For that we basically need to basically design our own stack class and include stack functionalities like push, pop, peek etc.

C++ Java

```
/* Java program to implement basic stack
operations */
class Stack {
    static final int MAX = 1000;
    int top;
    int a[] = new int[MAX]; // Maximum size of Stack

    boolean isEmpty()
    {
        return (top < 0);
    }
    Stack()
    {
        top = -1;
    }
```

```
boolean push(int x)
{
    if (top >= (MAX - 1)) {
        System.out.println("Stack Overflow");
        return false;
    }
    else {
        a[++top] = x;
        System.out.println(x + " pushed into stack");
        return true;
    }
}

int pop()
{
    if (top < 0) {
        System.out.println("Stack Underflow");
        return 0;
    }
    else {
        int x = a[top--];
        return x;
    }
}

int peek()
{
    if (top < 0) {
        System.out.println("Stack Underflow");
```

```
            return 0;
        }
        else {
            int x = a[top];
            return x;
        }
    }

    void print(){
    for(int i = top;i>-1;i--){
    System.out.print(" "+ a[i]);
    }
}
}

// Driver code
class Main {
    public static void main(String args[])
    {
        Stack s = new Stack();
        s.push(10);
        s.push(20);
        s.push(30);
        System.out.println(s.pop() + " Popped from stack");
        s.print();
    }
}
```

Output

```
10 pushed into stack
20 pushed into stack
30 pushed into stack
30 Popped from stack
Top element is : 20
Elements present in stack : 20 10
```

Advantages of array implementation:

- Easy to implement.
- Memory is saved as pointers are not involved.

Disadvantages of array implementation:

- It is not dynamic.
- It doesn't grow and shrink depending on needs at runtime.

We can implement dynamic size stack by using Vector in C++ and ArrayList in Java.