DATA STRUCTURE
STACK

Implement stack using static array

Declaration

```
#define MAX_SIZE 10

class stack
{
private:
    int arr[MAX_SIZE];
    int top = -1;

public:
    void push(int val);
    int pop();
    int peek();
    int is_empty();
};
```

Implementation

Push operation

```
void stack::push(int val)
{
    if (top == MAX_SIZE-1)
    {
        std::cout << "stack is full, can not push\n";
    }
    else
    {
        top++;
        arr[top] = val;
    }
}
```

Pop operation

```
int stack::pop()
{
    if (is_empty())
    {
        std::cout << "stack is empty, can not pop\n";
    }
    else
    {
        int val = arr[top];
        top--;
        return val;
    }
```

```
}
```

Peek operation

```
int stack::peek()
{
    if (is_empty())
    {
        std::cout << "stack is empty, can not peek\n";
        return -1;
    }
    else
    {
        return arr[top];
    }
}
```

Function is_empty()

```
int stack::is_empty()
{
    return (top == -1);
}
```

Performance

Operation	Complexity
push	O(1)
pop	O(1)
peek	O(1)

Pros

Simple

Operations takes constant time

Cons

Size is limited