Session 04: Stack

1. Definition

- Stack is a Linear Data Structure (like Array).

- Elements are stored in continuous memory.

- Operations are performed in particular fashion.

- Imagine stack as Physical Pile, a structure where insertion and deletion of items takes place at one end of the pile i.e. **top** of the Stack.

2. Data handling and memory allocation

- Stack store **homogeneous data**.

- Stacks are dynamic in size.

- All operation in stack are performed in constant time.

Array V/S Stack

Property	Array	Stack
Data elements	Homogenous	Homogeneous
Insertion	Insertion can be performed anywhere	Insertion can be performed only at the top.
Deletion	Deletion can be performed anywhere	Deletion can be performed only at the top.
Traversal	Possible	Standardly Not Preferred
Accessible elements	All	Only element stored at top.
Operations possible	Insert, delete, modify, traverse, sort, search and merge	Push, pop Peek is also an opt, though not standard

Quick Question – After getting this much knowledge about Stack what do you think is root principle behind operation performed on stack?

a) First in First out (FIFO) b)First In Last Out (FILO)
c) Last In First Out (LIFO) d) Last In Last Out (LILO)

3. Declaration and Initialization

- to be discussed in session…

4. Operations

- Inserting and deleting elements from stack takes constant time **i.e. O(1).**

- **Insertion**
  - Possible only at top of Stack – O(1)

- **Deletion**
  - Possible only at top of Stack – O(1)

- **Accessing the Top**
  - It takes O(1)

5. Functions Sneak-Peak

- Push ( )
- Pop ( )
- Top ( )
- Empty ( )
- Size ( )
  - To be discussed in detail during session…

6. Practice Problems

- to be discussed…

END NOTE

A big thanks to Ronak Joshi for putting this cheat sheet together.

Hope this proves to be useful to you. If you have any doubts regarding the content in this doc or any other related (or unrelated) topic please contact me. I am as excited for this as you are. Any and every feedback is appreciated.

We will try to continue preparing documents suited to your need so that you can have a look on your own whenever you feel like it. ***Remember that programming is actually a self-taught thing. There exists no one who can teach you programming, just the ones who do it with you and you all learn in the process.***

Good day!

Rinku Monani
monanira@gmail.com