07 - Stacks and Queues

Pre-Lab Exercises

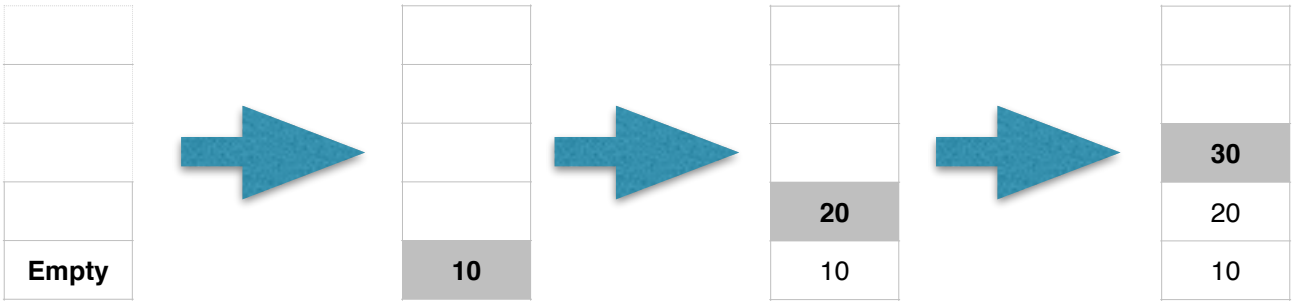
Exercise 1

Graphically represent the working of stack data structure and also all of its basic operations.

Push

An item is placed on to the top of the stack. Grey cells represent head of stack.

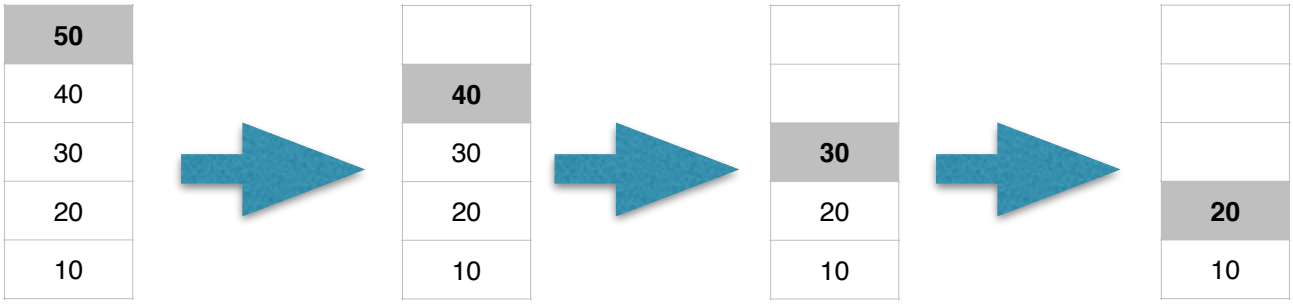
`Stack.push(10)` `Stack.push(20)` `Stack.push(30)`



Pop

An item is removed from the top of the stack and its value is stored in a variable.

`Stack.pop()` `Stack.pop()` `Stack.pop()`

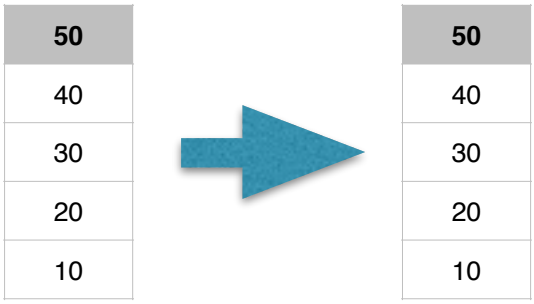


`last_Removed = Stack.pop()`	50	40	30

Peek

The value of the item at the top of the stack is returned without removing the item.

`Stack.peek()`




```
Stack.peek() = 50
Stack unchanged after peek
```

Exercise 2

Graphically represent the working of queue data structure and also all of its basic operations.

Add

A value is added to the end of the queue.

Rear					

`Queue.add(15)`

Rear/Front					
15					

`Queue.add(25)`

Rear	Front				
25	15				

`Queue.add(35)`

Rear		Front			
35	25	15			

Remove
An Item is removed from the front of the queue and stored in a variable.

Rear					Front
90	80	70	60	50	40

Queue.remove()

```
RemovedVariable = 40
```

Rear				Front	
90	80	70	60	50	

Queue.remove()

```
RemovedVariable = 50
```

Rear			Front		
90	80	70	60		

Queue.remove()

```
RemovedVariable = 60
```

Rear		Front			
90	80	70			

Peek

The variable at the front of the queue is read without removing it.

Rear					Front
90	80	70	60	50	40

`Queue.peek()`

`Returned Variable = 40`

Rear					Front
90	80	70	60	50	40

Queue is unchanged after peek operation