Java for Non-Majors CGS3416

Lecture 17 Part 2

Stack

This lecture is based on the notes from David Fernandez-Baca and Steve Kautz

Stacks

- A stack is an access-restricted list. You may manipulate only the item at the top of the stack: o push a new item onto the top of the stack void push(E item): Adds an element to the top of stack. • pop the top item off the stack E pop(): Removes and returns the top element of the stack. Throws NoSuchElementException if the stack is empty • examine (peek at) the top item of the stack E peek(): Returns the top element of the stack without removing it. Throws NoSuchElementException if the stack is empty boolean isEmpty(): Return true if the stack is empty, false otherwise
 - o int size(): Returns the number of elements in the stack.







	Dequ	le	
In fact, Java has required method modern Deque provides "a mod	a legacy Stack class ds. However, Oracle (for "doubly-ended or re complete and cons	that implements all the recommends using the queue) interface instead sistent set of LIFO st	ne more ad, as it tack
operations".	Stack Method	Deque Method	
	push()	addFirst()	
	pop()	removeFirst()	
	peek()	peekFirst()	





Implementing Stack - Array

- We need a data array, and an index top into data. Entries data[0], ..., data[top-1] contain the elements of the stack. A sequence of pushes and pops, starting from an empty stack.
- When there is no more space in the data array for another push, just double the size of the array.
- All operations take O(1) time (amortized, in the case of push).
- ArrayBasedStack.java is posted separately.



