Logo

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**LAB**

JAN 2023

TEB1113

Algorithm & Data Structure

*Lab 5*

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| **NO.** | **NAME** | **STUDENT ID** | **PROGRAM (IT / IS / CS / BM)** |
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import java.util.\*;

public class StackList {

private int[] arr;

private int top;

private int capacity;

public StackList(int size) {

arr = new int[size];

capacity = size;

top = -1;

}

class Node{

int data;

Node next;

public Node(int initialData){

data= initialData;

next=null;

}

}

public Node head = null;

public Node tail = null;

public int length(){

int counter = 0;

Node temp = head;

if (head == null){

return 0;

}

else if(head!=null){

while(temp.next != null){

temp = temp.next;

counter++;

}

}

return counter;

}

public void addNodeToEnd(int newEntry){

Node newNode = new Node(newEntry);

if(head==null){

head = newNode;

tail = newNode;

}else{

tail.next = newNode;

tail = newNode;

}

}

public void removeLastNode(){

Node temp = head;

if(head == null){

System.out.println("The linked list is empty. ");

}else{

for (int i = 1; i < length(); i++){

temp = temp.next;

}

tail = temp;

temp.next = null;

}

}

public boolean isEmpty(){return (top < 0) ? true: false;}

public boolean isFull(){return (top >= capacity - 1)? true: false;}

public void push(int data) {

if (isFull()) {

System.out.println("Stack is full.");

} else {

addNodeToEnd(data);

top++;

System.out.println("Item " + data + " is added.");

System.out.println(" ");

}

}

public int pop() {

if (isEmpty()) {

return -1;

} else {

System.out.println("Item " + tail.data + " has been removed.");

removeLastNode();

top--;

return tail.data;

}

}

public int peek() {

if (isEmpty()) {

System.out.println("Stack is empty.");

return -1;

} else {

return tail.data;

}

}

public int size() {

return top + 1;

}

public static void main(String[] args){

StackList obj = new StackList(5);

Scanner sc = new Scanner(System.in);

int ch = 0;

while (true){

System.out.println("Choose one option from the following: ");

System.out.println("1: Push");

System.out.println("2: Pop");

System.out.println("3: Peek");

System.out.println("4: Exit. ");

System.out.print("Enter your option: ");

ch= sc.nextInt();

switch(ch){

case 1: // Push

int input;

System.out.print("Enter the number that you want to add: ");

input = sc.nextInt();

obj.push(input);

continue;

case 2: // Pop

if(obj.isEmpty()){

System.out.println("Stack is empty.");

}else{

obj.pop();

}

System.out.println(" ");

continue;

case 3: // Peek

if(obj.isEmpty()){

System.out.println("Stack is empty.");

}else{

System.out.println("The top item is " + obj.peek());

}

System.out.println(" ");

continue;

case 4:

break;

default: System.out.println("Invalid input. ");

}

}

}

}

// <https://onlinegdb.com/ppWRNmgh3E>