Data Structure Questions and Answers – Stack using Array

« Prev Next »

This set of Data Structure Multiple Choice Questions & Answers (MCQs) focuses on “Stack using Array”.

1. Which of the following real world scenarios would you associate with a stack data structure?
a) piling up of chairs one above the other
b) people standing in a line to be serviced at a counter
c) offer services based on the priority of the customer
d) tatkal Ticket Booking in IRCTC
View Answer

Answer: a
Explanation: Stack follows Last In First Out (LIFO) policy. Piling up of chairs one above the other is based on LIFO, people standing in a line is a queue and if the service is based on priority, then it can be associated with a priority queue. Tatkal Ticket Booking Follows First in First Out Policy. People who click the book now first will enter the booking page first.

2. What does the following function check for? (all necessary headers to be included and function is called from main)

```
#define MAX 10

typedef struct stack
{
     int top;
     int item[MAX];
}stack;

int function(stack *s)
{
     if(s->top == -1)
         return 1;
      else return 0;
}
```

a) full stack
b) invalid index
c) empty stack
d) infinite stack
View Answer

Answer: c
Explanation: An empty stack is represented with the top-of-the-stack('top' in this case) to be equal to -1.

3. What does 'stack underflow' refer to?
a) accessing item from an undefined stack
b) adding items to a full stack
c) removing items from an empty stack
d) index out of bounds exception
View Answer

Answer: c
Explanation: Removing items from an empty stack is termed as stack underflow.

4. What is the output of the following program?


```
public class Stack
{
        protected static final int CAPACITY = 100;
        protected int size,top = -1;
        protected Object stk[];

        public Stack()
        {
                stk = new Object[CAPACITY];
        }

        public void push(Object item)
        {
                if(size_of_stack==size)
                {
                        System.out.println("Stack overflow");
                                return;
                }
                else
                {
                        top++;
                        stk[top]=item;
                }
```

```
        }
        public Object pop()
        {
                if(top<0)
                {
                        return -999;
                }
                else
                {
                        Object ele=stk[top];
                        top--;
                        size_of_stack--;
                        return ele;
                }
        }
}

public class StackDemo
{
        public static void main(String args[])
        {
                Stack myStack = new Stack();
                myStack.push(10);
                Object element1 = myStack.pop();
                Object element2 = myStack.pop();
                System.out.println(element2);
        }
}
```

a) stack is full
b) 20
c) 0
d) -999

View Answer

Answer: d
Explanation: The first call to pop() returns 10, whereas the second call to pop() would result in stack underflow and the program returns -999.

5. What is the time complexity of pop() operation when the stack is implemented using an array?
a) O(1)
b) O(n)
c) O(logn)
d) O(nlogn)

View Answer

Answer: a
Explanation: pop() accesses only one end of the structure, and hence constant time.

6. Which of the following array position will be occupied by a new element being pushed for a stack of size N elements(capacity of stack > N).
a) S[N-1]
b) S[N]
c) S[1]
d) S[0]
View Answer

Answer: b
Explanation: Elements are pushed at the end, hence N.

7. What happens when you pop from an empty stack while implementing using the Stack ADT in Java?
a) Undefined error
b) Compiler displays a warning
c) EmptyStackException is thrown
d) NoStackException is thrown
View Answer

Answer: c
Explanation: The Stack ADT throws an EmptyStackException if the stack is empty and a pop() operation is tried on it.

8. What is the functionality of the following piece of Java code?
Assume: 'a' is a non empty array of integers, the Stack class creates an array of specified size and provides a top pointer indicating TOS(top of stack), push and pop have normal meaning.


```
public void some_function(int[] a)
{
        Stack S=new Stack(a.length);
        int[] b=new int[a.length];
        for(int i=0;i<a.length;i++)
        {
                S.push(a[i]);
        }
        for(int i=0;i<a.length;i++)
        {
                b[i]=(int)(S.pop());
        }
        System.out.println("output :");
        for(int i=0;i<b.length;i++)
        {
                System.out.println(b[i]);
        }
}
```

a) print alternate elements of array
b) duplicate the given array
c) parentheses matching
d) reverse the array

View Answer

Answer: d
Explanation: Every element from the given array 'a' is pushed into the stack, and then the elements are popped out into the array 'b'. Stack is a LIFO structure, this results in reversing the given array.

9. Array implementation of Stack is not dynamic, which of the following statements supports this argument?
a) space allocation for array is fixed and cannot be changed during run-time
b) user unable to give the input for stack operations
c) a runtime exception halts execution
d) improper program compilation

View Answer

Answer: a
Explanation: You cannot modify the size of an array once the memory has been allocated, adding fewer elements than the array size would cause wastage of space, and adding more elements than the array size at run time would cause Stack Overflow.

10. Which of the following array element will return the top-of-the-stack-element for a stack of size N elements(capacity of stack > N).
a) S[N-1]
b) S[N]
c) S[N-2]
d) S[N+1]

View Answer

Answer: a
Explanation: Array indexing start from 0, hence N-1 is the last index.

Sanfoundry Global Education & Learning Series – Data Structure.

To practice all areas of Data Structure, here is complete set of 1000+ Multiple Choice Questions and Answers.

« Prev - Data Structure Questions and Answers – Circular Linked List

» Next - Data Structure Questions and Answers – Stack using Linked List

Recommended Posts:

1. Java Programming Examples on Java.Lang
2. Java Programming Examples on Exception Handling
3. Java Programming Examples on Inheritance
4. C Programming Examples on Arrays
5. Data Structures & Algorithms II – Questions and Answers
6. C Programming Examples using Recursion
7. C# Programming Examples on Exceptions
8. Java Programming Examples on Event Handling
9. Java Programming Examples on Collections
10. Python Programming Examples on Searching and Sorting
11. C++ Programming Examples on STL
12. Object Oriented Programming Questions and Answers
13. C Programming Examples on Searching and Sorting
14. Python Programming Examples on Stacks & Queues
15. C++ Programming Examples on Data-Structures
16. Java Programming Examples on Data-Structures
17. C Programming Examples on Stacks & Queues
18. C Programming Examples on Data-Structures
19. C# Programming Examples on Data Structures
20. Data Structure Questions and Answers

Manish Bhojasia, a technology veteran with 20+ years @ Cisco & Wipro, is Founder and CTO at Sanfoundry. He is Linux Kernel Developer & SAN Architect and is passionate about competency developments in these areas. He lives in Bangalore and delivers focused training sessions to IT professionals in Linux Kernel, Linux Debugging, Linux Device Drivers, L Networking, Linux Storage, Advanced C Programming, SAN Sto.

Technologies, SCSI Internals & Storage Protocols such as iSCSI & Fiber Channel. Stay connected with him @ LinkedIn