

ChaitanyaBharathi Institute of Technology
Department of Information Technology

Data Structures	((16IT C02)	-	Theory
Data Structures Lab	((16IT C05)	-	Lab

Following are the week wise viva questions which may be asked in lab sessions:

Week # (28.06.2017 to 04.07.2017)

1. Is there any difference between 'a' and "a"? if yes what is the difference.
2. What is the amount of memory required for storing 'a' and "a"?
3. Define an ADT.
4. Define the array ADT.
5. Explain what is meant by {row major order, column major order}.
6. Give a generic formula for the space complexity of an N dimensional array.
7. What is the time complexity of accessing an element of an N dimensional array?
8. Given an array declaration, what is the memory address of [some element] if the base address is X and each element of the array takes E memory locations?
9. Give a generic formula for finding the memory location of an array element, given the base address and array element size.
10. What is an STL? Write about vector STL.
11. List the STL's supported in C++.

Week # 1 (05.07.2017 to 11.07.2017)

Stacks

1. Give the class specification of Stack ADT
2. Define a stack.
3. Describe stack STL
4. List any 10 applications of Stack
5. Can a stack be implemented using linked list?
6. What is preferable a) implementing a stack using a linked list b) implementing a stack using an array? Justify
7. Draw the stack structure if linked list is used to implement

8. List the basic operations of stack
9. What is a double stack?
10. Any applications of double stack.....

“What is 4g? How is it different from 2g and 3g??”

Week # 2 & 3 – (13.07.2017 – 18.07.2017) & (20.07.2015 – 25.07.2017)

Linked Lists

1. List the advantages of linked list over arrays
2. Any disadvantages of linked list over arrays?
3. Difference between Single Linked list, Double Linked List and Circular Linked List
4. What is the relation between node class object and Class List in SLL, DLL or CLL.
5. What is in place reversal in a Linked List?
6. To store 10 integer elements what is the best data structure in terms of memory required a. array b. single linked list c. double linked list.
Defend your answer
7. What is the advantage of doubly linked list over single linked list?
8. How to form a circular linked list?
9. Give the specification for List ADT and node class if student details must be maintained in a linked list
10. List the reasons why two different classes must be used one for node and the other for listADT.
11. List the disadvantages if only one class is used for specifying ListADT.
12. Give the node class specification if the data to be stored in the node is of string type

“What is Internet of Things???”

Week # 4 (27.07.2017 to 01.08.2017)

Stacks & applications

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1. Analyse the time complexity of the operations that can be performed on stack.
2. Compute the time complexity for converting a given infix expression into postfix /prefix expression.
3. Compute the time complexity to evaluate an expression.
4. How will you convert an expression of this kind: $298 + 8899 * 1 - 65 + 32184$
(try it using a program, How to handle such an expression, if random length digits are used, instead of expressions like $9+6/4+3$).
5. How will you evaluate the expressions of this kind: $298 + 8899 * 1 - 65 + 32184$?
6. What is reverse polish notation?
7. What is double ended stack? Is it the same as double stack? Explain.
8. Is stack a dynamic data structure? Justify.
9. Is stack a LIFO or a FIFO?
10. What are the necessary conditions for push and pop in a stack?
(When stack is implemented using arrays and linked list)
11. What is purpose of pointer called 'top' in context of a stack?
12. Give the precedence and associativity of arithmetic, relational and logical operators.

“What is *extreme programming*?”

Week #5 (03.08.2017 to 10.08.2017)

Queues & applications

1. What is a queue?
2. What is a Deque, Circular Queue?
3. Why do we need a circular queue?
4. What is enqueue and what is dequeue?
5. List any 10 applications of Queues?
6. How to implement stack using queues?
7. How would you implement a Queue with a stack as the underlying data structure?
8. What is a priority queue?

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9. What is a double ended queue?
10. The following elements are inserted in a normal queue 51, 24, 13, 409 (in the same order), if 4 remove operations are called in what order will they be removed?
11. In linked list implementation of queue, if only front pointer is maintained, which of the following operation(s) take worst case linear time?
 - a. Insertion
 - b. deletion
 - c. To empty a queue
12. MAX is the size of the array used in the implementation of circular queue. How is rear manipulated while inserting an element in the queue?
 - a. $\text{rear} = (\text{rear} \% 1) + \text{MAX}$
 - b. $\text{rear} = \text{rear} \% (\text{MAX} + 1)$
 - c. $\text{rear} = (\text{rear} + 1) \% \text{MAX}$
 - d. $\text{rear} = \text{rear} + (1 \% \text{MAX})$
13. MAX is the size of the array used in implementing Circular queue using array. Array index starts at 0, front point to the first element in the queue, and rear point to the last element in the queue. Which of the following condition specify that circular is Full?
 - a. $\text{front} = \text{rear} = -1$
 - b. $\text{front} = (\text{rear} + 1) \% \text{MAX}$
 - c. $\text{rear} = \text{front} + 1$
 - d. $\text{rear} = (\text{front} + 1) \% \text{MAX}$
14. In linked list implementation of a queue, front and rear pointers are tracked. Which of these pointers will change during an insertion into empty queue?
15. An array of size MAX is used to implement Circular Queue. Front, rear and count are tracked, suppose front is 0 and rear is MAX-1. How many elements are present in the queue?
16. MAX is the size of the array used in implementation of circular queue, what condition specifies that circular is empty?
17. Learn Deque STL
18. Analyse the Performance of a deque realized by a doubly linked list.
19. What is an adapter?
20. What is the other name of adapter?
21. Illustrate the concept of adapter by implementing stack using deque.
22. What is a container?
23. Define an Iterator.
24. Specify List ADT (Pg 240, Sec 6.2.2)
25. What is a sentinel node in DLL?

26. What is a cursor?
27. List the different types of iterators with their capabilities
28. Define sequence container and associated container
29. List three examples of Sequence containers.
30. List four examples of associated containers
31. List the member functions of STL
 - a. Stack
 - b. Queue
 - c. Vector
 - d. List
 - e. Deque
 - f. Algorithm
 - g. Set
 - h. Map

What is Hard Coding???

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