Data Structures (CS301)

Question 1 (Marks: 1) Attempted 1 Total 50

Consider the following infix expression.
6/2 + 5
If one converts the above expression into postfix, what would be the resultant expression?

Choice

62/ + 5

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6 2 5/ +

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6 2 / 5 +

/62 + 5

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```
3. if(p->RTH == thread)
4. return(p->R);
5. else {
6. p = p.R;
7. while(p->LTH == child)
8. p = p.L;
```

Answe

Below is given code of nextInorder function. You are required to find and correct the errors.

```
1. TreeNode* nextInorder(TreeNode* p)
2. {
3. if(p->RTH == thread)
4. return(p->R);
5. else {
6. p = p.R;
7. while(p->LTH == child)
8. p = p.L;
9. return p;
10. }
11. }
```

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Following function searches an element from a sorted array. But there are some mistakes in it, you are required to find and correct those mistakes.

```
int isPresent(int *arr, int val, int N)
{
  int low = 0;
```

Answe

Following function searches an element from a sorted array. But there are some mistakes in it, you are required to find and correct those mistakes.

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```
int isPresent(int *arr, int val, int N)
{
  int low = 0;
  int high = N - 1;
  int mid;
  while ( low <= high )
  {
                mid = ( low - high )/2;
                if (arr[mid] == val)
                  return 1;      // found!
                else if (arr[mid] > val)
                   low = mid - 1;
                else
                  high = mid + 1;
}
return 0; // not found
}
```

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Questio 49 (Marks: 5)

Following is the prototype of buildHeap() method of min heap.

void Heap<eType>::buildHeap(eType* anArray, int n)

You are required to write it's implementation.

Answe

Following is the prototype of buildHeap() method of min heap.

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Questio 45 (Marks: 3) Attempted 45 Total

Which cases of deletion of node in an AVL tree does not require rotation?

Data Structures (CS301)

Questio 44 (Marks: 3) Attempted 44 Total 5

"For smaller lists, linear insertion sort performs well, but for larger lists, quick sort is suitable to apply." Justify why?

Answe

What is the output of the following recursive function when integer value 3 is passed as argument for x ?

```
void F(int x)
  {
    if(x>1)
```

Answe

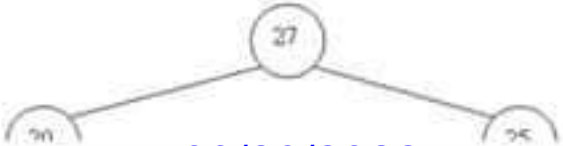
What is the output of the following recursive function when integer value 3 is passed as argument for x ?

```
void F(int x)
  {
    if(x>1)
      F(x-1);
    cout << x <<'\t';
  }
```

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Questio 42 (Marks: 3) Attempted

Consider the following Max Heap add node 24 in it and show the resultant Heap.



Answe

By Adding node 24 we will have the below heap

Questio 40 (Marks: 1) Attempted 40 Total 50

Consider a min heap, represented by the following array:
11, 33, 44, 55, 66
After inserting a node with value 22.Which of the following is the updated min heap?

Choice

11, 33, 22, 55, 66, 44

11, 22, 33, 44, 66, 55

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11, 22, 33, 66, 44, 55

11, 22, 66, 33, 44, 55

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Questio 48 (Marks: 5) Attempted

Show the result of inserting the values **35, 19, 41, 39, 37, 28, 31, 14** into an empty AVL Tree.

You have to show only the complete AVL tree, steps are not required.

Answe

The Index of an Array is used for:

Choice

Negating array size

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Retrieving array elements

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Changing array name

Multiplication of array size

Question 38 (Marks: 1) Attempted 38 Total 50

In a Skip list of n items, search operation will take _____ time in searching.

Choice

Log:N

NlogN

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N

NlogN

Questio 35 (Marks: 1) Attempted 34 Total 50

Binary Search is an algorithm of searching, used with the _____ data.

Choice

- Sorted
- Unsorted
- Heterogeneous
- Random

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Which of the following can be the inclusion criteria for pixels in image segmentation ?

Choice

Pixel intensity

Texture

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Threshold of intensity

Pixel intensity, Texture and Threshold of intensity

Questio 37 (Marks: 1) Attempted 36 Total 50

Local variables of a function are stored on:

Choice

Stack

Registered

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Pointers

Array

Questio 34 (Marks: 1) Attempted 34 Total 50

Which one of the following algorithm is most widely used due to its good average time?

Choice

Bubble Sort

Insertion Sort

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Merge Sort

Quick Sort

Questio 33 (Marks: 1) Attempted 33 Total 50

Compilers use _____ in order to implement _____.

Choice

Symbol table, hash table

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Hash table, symbol table

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Hash table, heap

Symbol table, heap

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Questio 32 (Marks: 1) Attempted 31 Total 50

A complete binary tree is a tree that is completely filled, with the possible exception of the _____level.

Choice

bottom

top

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left

right

_____ introduced Huffman code algorithm.

Choice

Jon Huffman

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David Huffman

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Alex Huffman

Morley Huffman

Case 1b of deletion in AVL tree is that the parent of the deleted node had a balance of _____ and the node was deleted in the parent's right subtree.

Choice

0

3

6

9

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Union by height is an alternative to:

Choice

Union by rank

Union by width

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Union by weight

Union by scale

Questio 26 (Marks: 1) Attempted 25 Total 50

find() operation in data structure used to implement disjoint set will take _____ parameter/s.

Choice

One

Two

Three

Four

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In AVL the deletion of a node is considerably more _____ than the insertion of a node.

Choice

complex

easy

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accurate

strong

Questio 28 (Marks: 1) Attempted 27 Total 50

For fast searching using skip list we use_____.

Choice

Unsorted Chain

Sorted Chain

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Only Numbers Chain

Only Alphabets Chain

Questio 25 (Marks: 1) Attempted 24 Total 50

The disjoint sets _____ equivalence relation.

Choice

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Always hold

May or may not hold

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Cannot related to

Are opposite to

Data Structures (CS301)

Question 24 (Marks: 1) Attempted 23 Total 50

Image segmentation is a/an _____ problem.

Choice

Data com & Networks

Databases

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Computer Vision

Operating system

In a heap, getMin method gives us the minimum value in the heap. It uses _____ method.

Choice

- !isEmpty( )
- !isFull( )
- getMax( )
- getLeft( )

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Questio 2 (Marks: 1) Attempted 1 Total 50

Compiler uses which one of the following to evaluate a mathematical equation?

Choice

Binary Tree

Binary Search Tree

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Parse Tree

AVL Tree

Questio 21 (Marks: 1) Attempted 21 Total 50

A tree is said to be a _____ tree if every non-leaf node in a binary tree has non-empty left and right subtrees.

Choice

Binary

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Strict Binary

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Complete Binary

Expression

By removing the root from the min heap, we always get _____ value from the heap.

Choice

largest

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smallest

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duplicate

any random

_____ means to put the data in a certain order or sequence.

Choice

Sorting

Searching

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Deletion

Insertion

Questio 19 (Marks: 1) Attempted 18 Total 50

Collision takes place when two or more keys (data items) produce the _____ index.

Choice

Different

Same

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1st

2nd

Questio 18 (Marks: 1) Attempted 17 Total 50

There are _____ neighbors of the pixel.

Choice

Four

Eight

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Two

Five

Questio 17 (Marks: 1) Attempted 17 Total 50

Which operation gives decreasing order of elements in a heap where the maximum value element is stored at the top?

Choice

Insertion

Updation

Retrieval

Deletion

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Questio 14 (Marks: 1) Attempted 13 Total 50

If there are N elements in a sorted array then the number of maximum steps needed to find an element using Binary Search is _____ .

Choice

N

N^2

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$N\log_2 N$

$\log_2 N$

Questio 15 (Marks: 1) Attempted 15 Total 50

The variables declared as static are not saved in/on the_____.

Choice

Queue

Priority Queue

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Linked list

Stack

Questio 16 (Marks: 1) Attempted 16 Total 50

Which one of the following algorithm is least efficient?

Choice

Quick Sort

Insertion Sort

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Merge Sort

Bubble Sort

Question 13 (Marks: 1) Attempted 12 Total 50

Hash function can reduce searching operation to_____ time in its best and average cases.

Choice

- constant
- linear
- algorithmic
- quadratic

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Suppose we had a hash table whose hash function is "n % 12", if the number 35 is already in the hash table, which of the following numbers would cause a collision?

Choice

144

145

143

148

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Question 11 (Marks: 1) Attempted 10 Total 50

A column of a table is known as:

Choice

Record

Field

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Tuple

Dictionarie

Questio 8 (Marks: 1) Attempted 7 Total 50

An array x of 100 integers is declared as;

Choice

- int x = [100];
- int x[100];

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- integer array x = 100;
- integer x [] = 100 ;

Which one is in-order traversal technique?

Choice

(L,N, R)

(N, R, L)

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(R, N, L)

(R, L, N)

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Questio 10 (Marks: 1) Attempted 10 Total 50

Here is an array of ten integers:

5 3 8 9 1 7 0 2 6 4

Array after the FIRST iteration of the main loop in **selection sort** algorithm will be (sorting from smallest to largest) :

Choice

2 6 4 9 1 7 0 3 8 5

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0 3 8 2 6 4 9 1 7 5

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0 3 8 9 1 7 5 2 6 4

2 6 4 0 3 8 9 1 7 5

Questio 6 (Marks: 1) Attempted 6 Total 50

If there are N external nodes in a Binary tree, than number of internal nodes will be:

Choice

- N-1
- N+1
- N+2
- N

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Question 5 (Marks: 1) Attempted 4 Total 50

The worst-case running time of Quick sort algorithm is:

Choice

O (n^2)

O (nlogn)

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O (logn)

O (log n/2)

Questio 3 (Marks: 1) Attempted 2 Total 50

In a skip list, list S_0 holds the keys of S in which of the following order?

Choice

Decreasing

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Non-decreasing

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Non-increasing

Random

Question: 4 (Marks: 1) Attempted: 3 Total: 50

Hash function is used to convert:

Choice

A hash number key to a key

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A key to a hash value

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Data into table

Character data into integer data

Questio 4 (Marks: 1) Attempted 3 Total 50

Hash function is used to convert:

Choice

A hash number key to a key

A key to a hash value

Data into table

Character data into integer data

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Data Structures (CS301)

Questio 7 (Marks: 1) Attempted 6 Total 50

Which traversing method ensures that data will be traverse in ascending order?

Choice

- In-order
- Pre-order
- Level-order
- Post-order

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