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Course Code :- CS1-217

Course Title :- Data Structure

'' Final Assessment ''

(a)Data Structure:

In computer science, a data structure is a data organization, management, and storage format that is usually chosen for efficient access to data.

Array operators:

Array operators are performed on vectors and matrices.

Array operators enables us to define

array attributes - blob attributes that represent numeric array of 64-bit

integer or double values. We can use

one of the important variations like syntax variations of the array operator ([]) to reference specific elements of an array attribute in expressions.

Ans to the Q No-1

(b)

Operations of data structure:

Traversal, Insertion, Deletion, Searching, Sorting, and Merging are some operations that can be performed on a linear data structure. Stack and queue are two examples of linear data structures.

These operations are the structural program of data structure.

Advantages of Data Structure:

- a) The data structure is a good solution for storing data on framework.
- b) Data structure makes easier way for us to handle work.
- c) Data structures also aid us in efficiently storing data in circles so that we can recover the data.
- d) Data structures are critical for planning computations.
- e) Data structures are one mechanism for arranging data into a specified structure.

1) Data structures allow us to reuse data.

2) Data structures are also used in the database administration framework industry for creating a list, storing data using B, B+ trees, and so on.

Ans to the Q No 1

(c)

Array Types:

In computer science, array is a data type that represents a collection of elements, each selected by one or more indices that can be computed

at run time during program execution.

Such a collection is usually called an array variable or array value.

Array operators:

Array operators are performed on matrices and vectors.

Array operators enables us to define

array attributes - blob attributes that

represent numeric array of 64-bit

integer or double values. We can use

one of the main variations like syntax

variations of the array operator ([])

to reference specific elements

of an array attribute in expressions.

Ans to Q. No. 2(a)Basic operations on stack:

There are basically three operations that can be performed on stacks.

They are -

① Inserting an item into a stack

(Push).

② Deleting an item from the

stack (Pop).

③ Displaying the contents of the

stack (peek or top).

Stack's Application:

A stack is widely used linear data structure in modern computers in which insertions and deletions of an element can occur only at one end, and top of the stack. It is used in all those applications in which data must be stored and retrieved in the last.

Various applications of stack in data

structure:

- (a) Evaluation of Arithmetic Expressions.
- (b) Backtracking.
- (c) Delimiter checking.

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d) Reverse a data structure

e) Processing function calls

Ans to the Q No. 2

(b)

In graph theory, a graph representation is a technique to store graph into the memory of computer.

To represent a graph, we just need the set of vertices, and for each vertex the neighbors of the vertex (vertices which is directly connected to it by an edge).

Ans - to - the - Q - No - 2

(c)

The formula for calculating arithmetic mean is (sum of all observations) / (number of observation).

for example, the arithmetic mean of a set of numbers {10, 20, 30, 40}

can be find now

$$\text{Arithmetic mean} = \frac{(10+20+30+40)}{4}$$

$$= \frac{100}{4}$$

$$= 25$$

(Ans.)

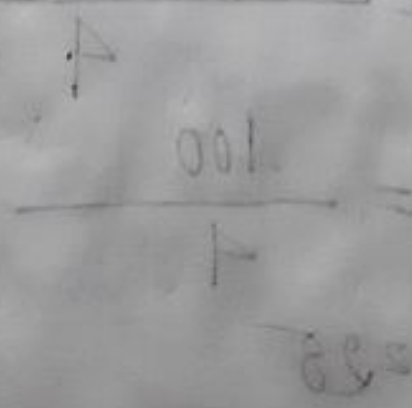
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Ans to the Q No 3

(a)

In computer science, a binary tree is a tree data structure in which each node has at most two children, referred to as the left child and the right child. That is, it is a k -ary tree with

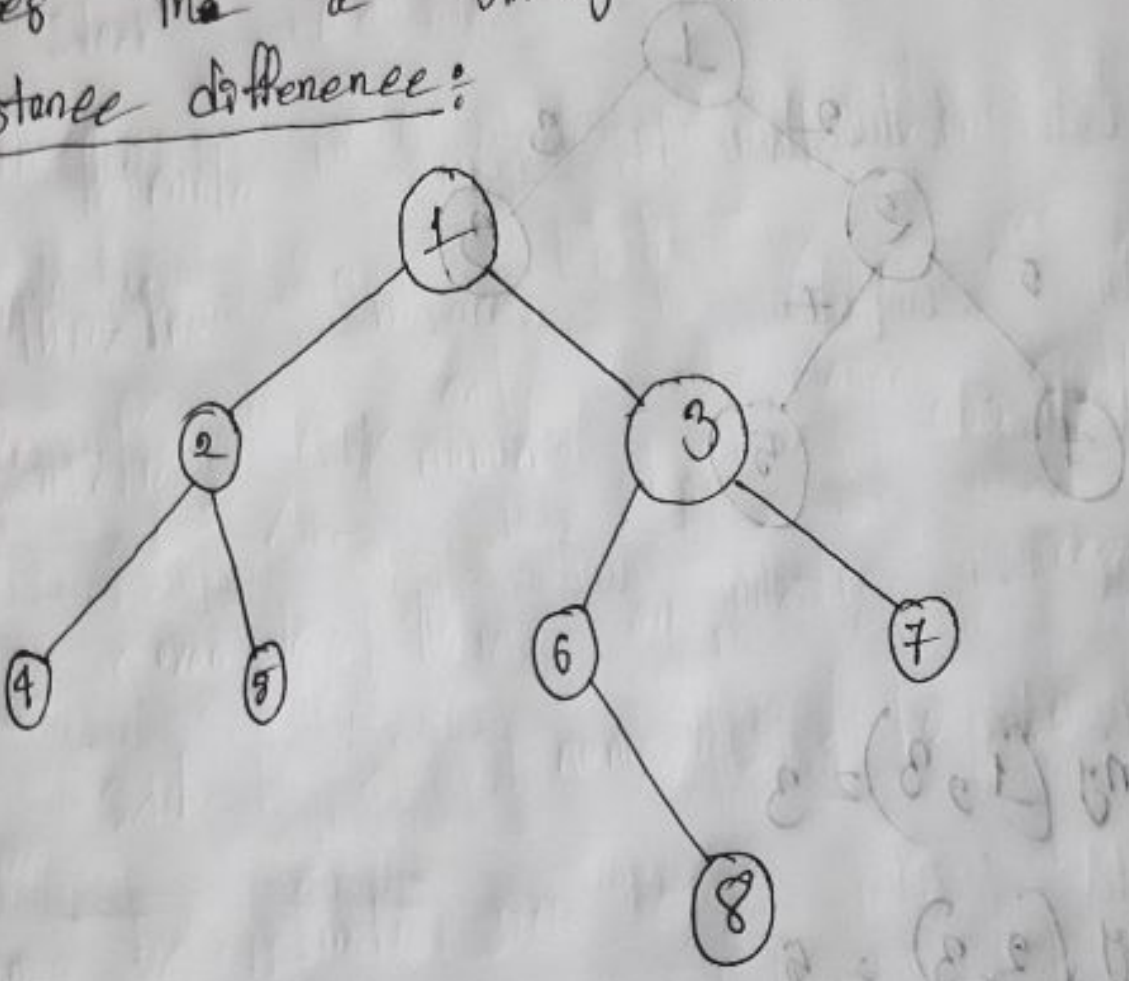
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(b)

There is some difference between two nodes in a binary tree

Distance difference:



Examples -

$\text{Dist}(4,5) = 2$

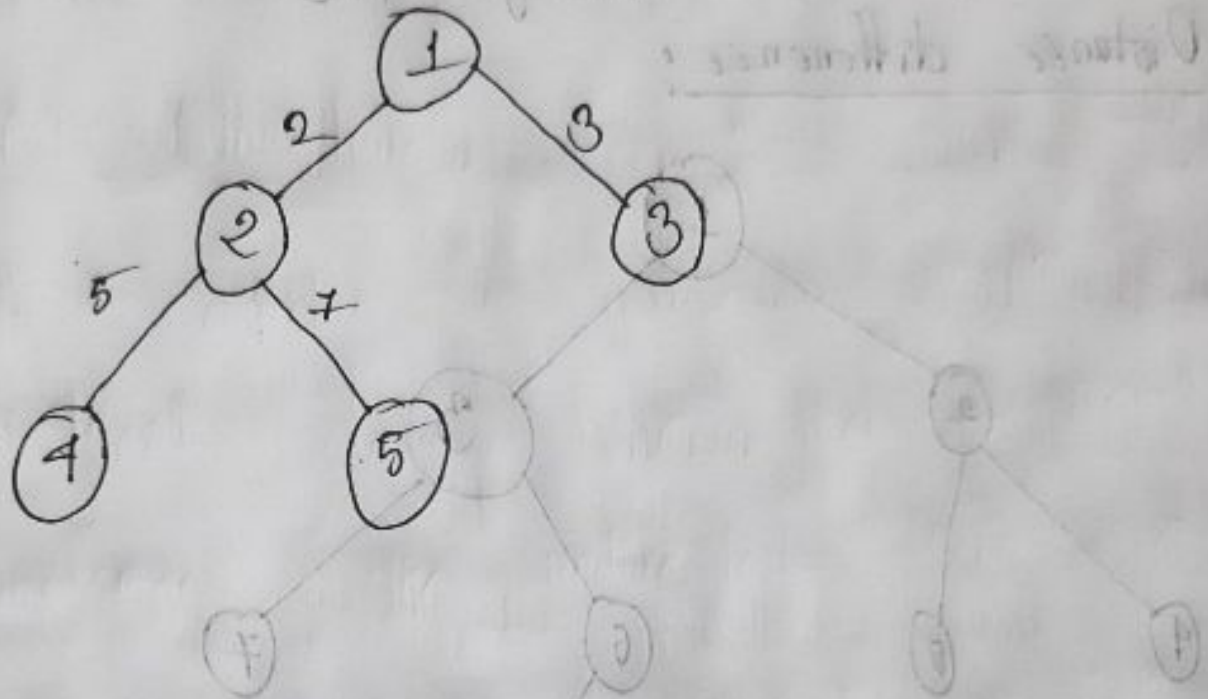
$\text{Dist}(4,6) = 4$

$\text{Dist}(3,4) = 3$

$\text{Dist}(2,4) = 1$

$\text{Dist}(8,5) = 5$

Queries:



Query (1, 3) = 3

Query (2, 3) = 5

Query (3, 5) = 12

Query (4, 5) = 12

Level :

Level = 0

Level = 1

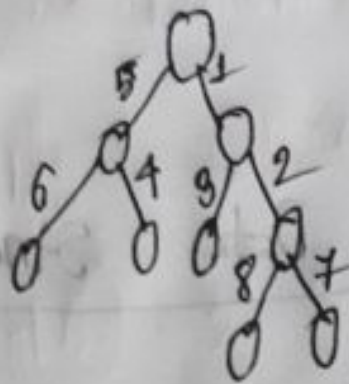
Level = 2

Level = 3

Following levels are different from each other.

Other :

Edge Difference :



5, 1, 6, 4, 9, 2, 8, 7 are the different edges for the binary tree.

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Ans to the Q. No. 3

(a)

Data Structure's Graphs

In Computer science, a graph is an abstract data type that is meant to implement the undirected graph and directed graph concepts from the field of graph theory within mathematics.

Applications of Graph Data Structure:

① In Computer science.

② Google maps.

- ③ In Facebook.
- ④ In World Wide Web.
- ⑤ In Operating System.
- ⑥ In mapping system.
- ⑦ In Facebook.
- ⑧ Microsoft Excel.
- ⑨ In the Dijkstra algorithm.
- ⑩ on social media sites.
- ⑪ In biochemical applications.