DATA STRUCTURES USING 'C'

Lecture-05

Data Structures

DATA STRUCTURE

AND ITS TYPES

Data Structure

It is a logical way of storing data and it also define mechanism of retrieve data.

Types of Data Structure

DATA STRUCTURE

LINEAR

NON LINEAR

Data Structure Operation

Traversing: Accessing each record exactly once so that certain item in the record may be processed.

Searching: finding the location of the record with a given key value .

Insertion : add a new record to the structure

Deletion : removing a record from the structure

Linear Data Structure

1.Array

2.Stack

3.Queue

4.Linked List

1.Array

An array is a collection of homogeneous type of data elements.

An array is consisting of a collection of elements .

Operation Performed On Array

1. Traversing
2. Search
3. Insertion
4. Deletion
5. Sorting
6. Merging

Representation of array in memory

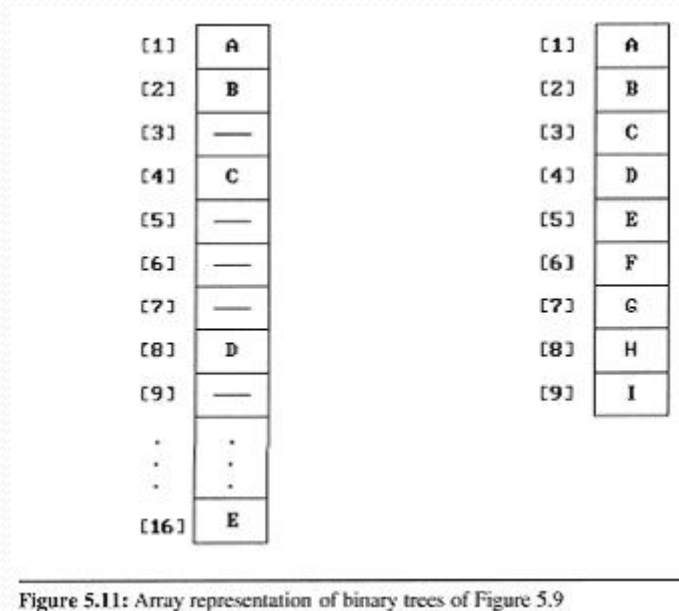| 1 |
|---|
| 2 |
| 3 |
| 4 |
| 5 |

Array Representation

Figure 5.11: Array representation of binary trees of Figure 5.9

2.Stack

A Stack is a list of elements in which an element may be inserted or deleted at one end which is known as TOP of the stack.
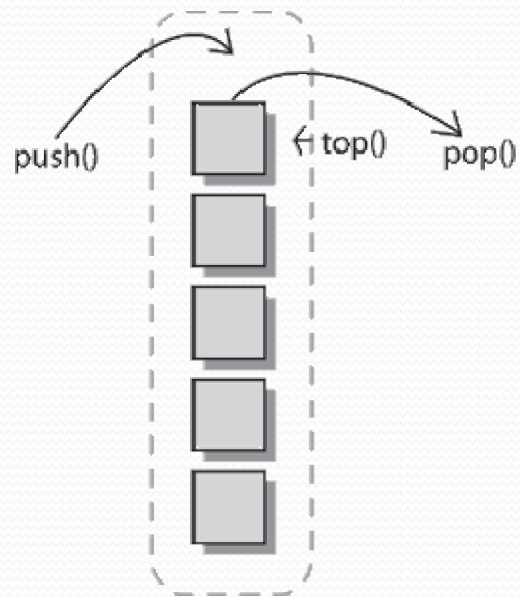
Operation Performed on Stack

Push: add an element in stack

Pop: remove an element in stack

Representation of Stack

EEE	TOP
DDD	
CCC	
BBB	
AAA	

Stack Representation

3.Queue

A queue is a linear list of element in which insertion can be done at one end which is known as front and deletion can be done which is known as rear.

Operation Performed On
Queue

Insertion : add a new element in queue

Deletion: Removing an element in queue

Representation of Queue

Queue Representation
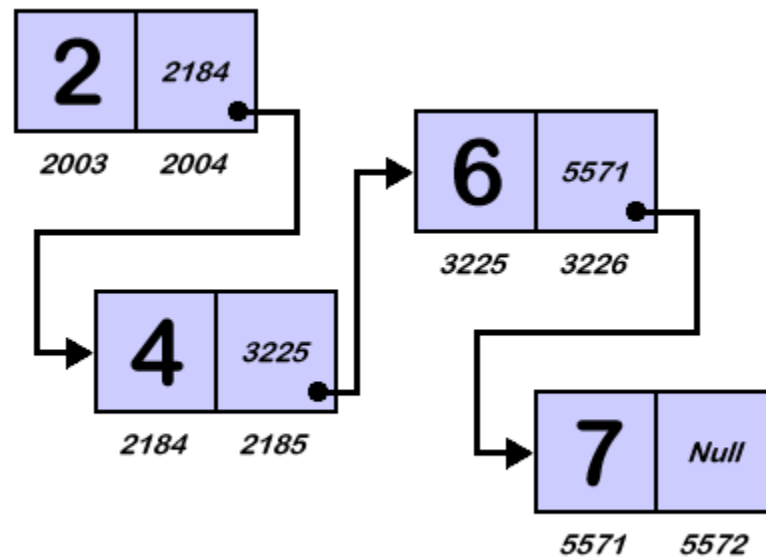
A
B
Context Change
C
D

4.Linked List

A Linked list is a linear collection of data elements .It has two part one is info and other is link part.info part gives information and link part is address of next node

Operation Performed on Linked List

1. Traversing
2. Searching
3. Insertion
4. Deletion

Linked Representation
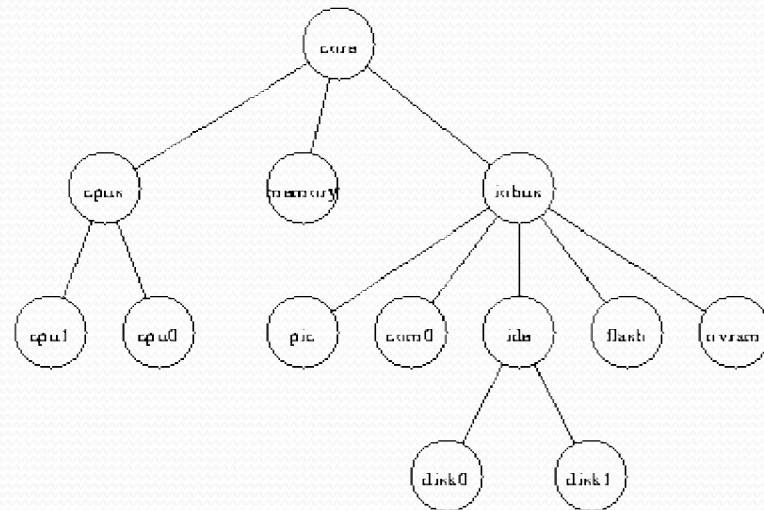
2.Non Linear

1.Tree

2.Graph

1.Tree

*In computer science, a **tree** is a widely-used data structure that emulates a hierarchical tree structure with a set of linked nodes.*

Operation On Tree

1. Insertion

2. Deletion

3. Searching

Tree Representation

2.Graph

A graph data structure may also associate to each edge some **edge value**, such as a symbolic label or a numeric attribute (cost, capacity, length, etc.).

Operation Performed Graph

1.Searching

2.Insertion

3.Deletion

Graph Representation