1. what is recursion explain with example.

Recursion is the process or techique by which a function call's itself. Thus the function is called as "recursion"

A recursion can be classified as direct recursion and indirect recursion

In direct recursion. thus the function calls itself and.
In indirect recursion. the function (f_1) calls another function (f_2) calls the calling function (f_1)

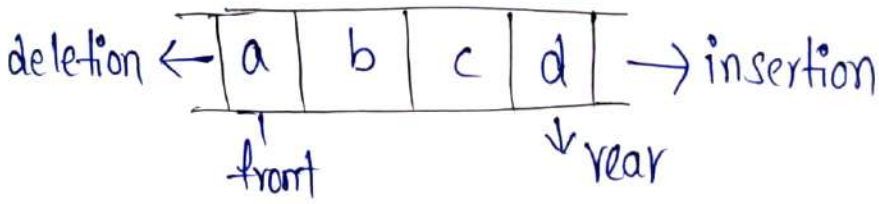
Ex:- Implementation of factorial using direct recursion

```
int fact(intn)
{
int f;
if(n==0 :: n==1)
F=1;
else
F = n*fact(n-1);
return f;
}
```

2. What is queue? explain primitive operation on queue?

A queue is ordered collection of items in which items may be inserted at one end known as rear and and items may be deleted from other end known as front end.

1) queue is known a LIFO because the element which is inserted first will be deleted first



Primitive operator:—

The operation performed on queue is insertion and deletion.

a) Insertion:—

Adds new item at end rear of queue insertion operation performs on the following actions

1) If rear = max-1

2) otherwise, increments rear by 1 and items new element are rear position

Deletion:-

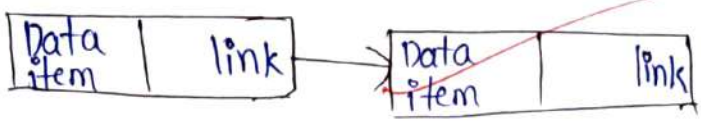
Delete an item from front end of queue

3. Define linked list? with example what are the operation performed on it?

Linked list is an linear data structure used to store similar data in memory

linked list is a collection of elements known as nodes which contain two fields of information one contains data item and other contains link field

A node can be represented as

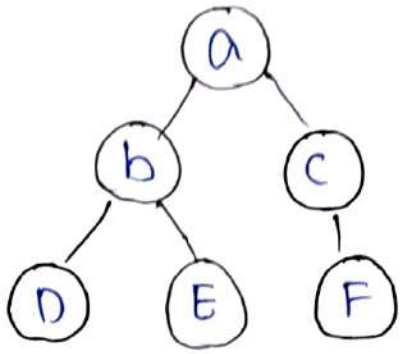


operations on linked list:-

1) Traversing the list
2) Inserting the node as begining of the list
3) Inserting the node as the end of the list
4) Inserting the node as specific position on the list
5) Deleting the node from list
6) modifying the data value on any node.

1. Define tree? Explain how a general tree is represented

A tree is a non-linear data structure represented in a hierarchical manner. It contains a finite set of elements called "nodes" These are connected to each other using a finite set of directed lined are called "branches"



A general tree can be represented either using a sequential organisation or a linked organisation for a genralised linked list a node must have varying fields based on the no. of branches.

The following figure shows represented of node structure

Datatype	link 1.	link 2	.....	linkn

Hence the node with mode data is the most (data) node of the tree

can also represented in the form of linked list

Tag of 1	Data (link) down	link next

5. Define graph? Explain graph Abstract data type?

A graph is defined as $G = (V, E)$

Where V = set of elements called nodes

E = set of (unique) edges of the graph identified with a unique pair (u, v) of an node (u)

Here (u, v) pair denotes that there is an edge from node u to nodes v

graph:-

A graph is a data structure that consists of set of nodes and set of (node) arcs every edge present in the graph is indicated by a pair of verlices

ADT operations are as follow:

1) create ()
2) delete vertex()
3) insert vertex()
4) insert edge ()
5) Boolen is empty()
6) List adjacent ()