7/12/21

2CSE302

DS (BDA)

Prajapati Yash .P   20162121023

Date
Page 1

(1) Algorithm for Quick Sort :-

QuickSort (arr[], start, end)
Step 1 = if (start < end)
Step 2 = set p = Partition (arr, start, end)
Step 3 = Quick Sort (arr, start, p-1)
Step 4 = Quick Sort (arr, p+1, end)
end if

Partition (arr[], start, end)
Step 1 = set pivot = arr [start]
Step 2 = set i = start +1 ; and j = end;
Step 3 = do if (i<j)
Step 4 = if (arr [i] <= pivot)
then i++ ;
Step 5 = if (arr[j] > pivot)
then j-- ;
Step 6 = if (i<j)
then swap (arr [i], arr[j])
Step 7 = swap (arr[start], arr [j])
Step 8 = return j.

According to given array,

45	34	23	68	91	12
↑ pivot	↑ i				↑ j

Pass 1 :

45	34	23	68	91	12
↑ pivot					

(BDA)

Date
Page 2

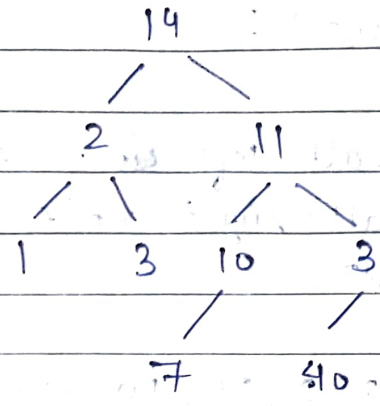
Prajapati Yash. P. 20162121023

Pass 2 :-

12	34	23	45	91	68

Pass 3 :-

4



The elements of the tree from top, left and right are :-

14 → 2 → 1 → 3 → 11 → 10 → 7 → 30 → 40

(A) Inorder Traversal :-

Step 1 :- visit all nodes in left
Step 2 :- visit root nodes
Step 3 :- visit nodes in right.

∴ Inorder = 1, 2, 3, 14, 7, 10, 40, 30, 11, 14

(B) Pre-order Traversal :-

Step 1 :- visit root
Step 2 :- visit left nodes
Step 3 :- visit right nodes.

∴ Preorder = 14, 2, 1, 3, 11, 10, 7, 30, 40

(C) Post-order Traversal :-

Step 1:- visit all left nodes
Step 2:- visit all right nodes
Step 3:- visit root

∴ Post order = 1, 3, 2, 7, 10, 40, 30, 11, 14.

A3 Size = 10
Keys = (70, 45, 23, 56, 32, 26, 35, 66, 54, 91)

hash function ⇒ $h(k) = k \bmod 10$

⇒ $h(70) = 70 \bmod 10 = 0$

⇒ $h(45) = 45 \bmod 10 = 5$

⇒ $h(23) = 23 \bmod 10 = 3$

⇒ $h(56) = 56 \bmod 10 = 6$

⇒ $h(32) = 32 \bmod 10 = 2$

⇒ $h(26) = 26 \bmod 10 = 6$

as 6 is occupied by 56,
we use linear probing.
$h(k, i) = [h(k) + i] \bmod m$

$\therefore h(k,i) = (h(k)+i) \bmod 10$

$i = 0$ to 9. (size of hash table)

Now, $(6+1) \bmod 10$

$= 7 \bmod 10$

$h(26) = 7$

⇒ $h(35) = 35 \bmod 10$

$= 5$

but 5 is already occupied by 45

$\therefore h(k,i) = (h(k)+i) \bmod 10$

$h(5,1) = 5+1 \bmod 10$

$= 6 \bmod 10$

$= 6$. It is also occupied.

$\therefore h(5,2) = (5+2) \bmod 10$

$= 7 \bmod 10 = 7$. It is also occupied

$\therefore h(5,3) = 8 \bmod 10$

$h(35) = 8$.

⇒ $h(66) = 66 \bmod 10 = 6$

Now, as we know, 6, 7, 8 are occupied

$\therefore h(6,3) = (6+3) \bmod 10 = 9$.

⇒ $h(54) = 54 \bmod 10 = 4$

⇒ $h(91) = 91 \bmod 10 = 1$

PTO →

PTO →

Prajapati Yash P. 201621210023

⇒ Hash table is as follows :-

key	value
0	70
1	91
2	32
3	23
4	54
5	45
6	56
7	26
8	35
9	66

A2

```
struct node
{
    int data;
    struct node *prev;
    struct node *next;
};

struct node *start;

void insert (node* current, int pos, int value
{
    if (pos < 1 || pos > size + 1)
    {
        printf (" Invalid Position ");
    }
```

Prajapati Yash.P. 201621121023

```
else {
    ~~write opos~~
}
    ~~if(opos==0){~~
    ~~node* temp = node_data;~~
    ~~temp->next = *current;~~
    ~~*[illegible]~~
    new_node = (struct node*) malloc (sizeof(struct node));

    new_node -> next = temp -> next;
    (temp -> next) -> prev = new_node;
    temp -> next = new_node;
    new_node -> prev = temp;
  }
}
```

Table :-

	Data	Prev	Next
1001	22	1007	1002
1002	41	1001	1004
1003			
1004	53	1002	1005
1005	16	1004	1006
1006	71	1005	1007
1007	25	1006	1001