

S.No	Date	IDX	PROGRAM
2	09-07-2015	2.1	Maximum and Minimum element in array using Divide and conquer
		2.2	Construct Max Heap using arrays, delete any element and display the content of the Heap
		2.3	Construct Min Heap using arrays, delete any element and display the content of the Heap

Week 2 - Program 2.1

AIM : Write a program to find maximum and minimum element in array using Divide and conquer.

PROGRAM :

```
#include <stdio.h>
void maxmin(int [], int, int, int*, int*);

void maxmin(int a[], int low, int high, int *min, int *max)
{
    if (low == high)
        *min = *max = a[low];
    else if (low == high - 1)
    {
        if (a[low] < a[high])
        {
            *min = a[low];
            *max = a[high];
        }
        else
        {
            *min = a[high];
            *max = a[low];
        }
    }
    else
    {
        int mid = (low + high) / 2;
        int Min1, Max1, Min2, Max2;
        maxmin(a, low, mid, &Min1, &Max1);
        maxmin(a, mid + 1, high, &Min2, &Max2);
        *min = (Min1 < Min2) ? Min1 : Min2;
        *max = (Max1 > Max2) ? Max1 : Max2;
    }
}
```

```
}

int main()
{
    int n,a[50],min,max,i,j;

    printf("\n Enter no of elements : ");
    scanf("%d",&n);
    printf("\n Enter the Elements : ");
    for(i=0;i<n;i++)
        scanf("%d",&a[i]);
    maxmin(a, 0, n - 1, &min, &max);
    printf("\n miminum element = %d",min);
    printf("\n maximum element = %d",max);
    return 0;
}
```

OUTPUT:

```
Enter no of elements : 5

Enter the Elements : 10 25 16 90 40

miminum element = 10
maximum element = 90
```

Week 2- Program 2.2

AIM : Construct Max Heap using arrays, delete any element and display the content of the Heap.

PROGRAM:

```
#include<stdio.h>
void heapsort(int a[20],int i, int n)
{
    int j,k,result = 1;
    k = a[i];
    j = 2*i;
    while((j <= n) && (result != 0))
    {
        if(j < n)
            if(a[j] < a[j+1])
                j = j+1;
        if(k >= a[j])
            result = 0;
        else
        {
            a[j/2] = a[j];
            j = 2*j;
        }
        a[j/2] = k;
    }
}

int main()
{
    int n, a[50], i, t;
    printf("\n how many numbers : ");
    scanf("%d",&n);
    printf("\n enter the numbers : ");
    for (i=1; i<=n; i++)
        scanf("%d",&a[i]);
    for (i=n/2; i>=1; i--)
        heapsort(a,i,n);
    for (i=n-1; i>=1; i--)
    {
```

```
    t = a[i+1];
    a[i+1] = a[1];
    a[1] = t;
    heapsort(a,1,i);
}
printf("\n\n the sorted list is : ");
for(i = 1; i<=n;i++)
    printf("\t%d",a[i]);
return 0;
}
```

OUTPUT:

```
how many numbers : 5
enter the numbers : 20 45 12 76 35

the sorted list is :  12      20      35      45      76
```

Week 2- Program 2.3

AIM : Construct Min Heap using arrays, delete any element and display the content of the Heap.

PROGRAM:

```
#include<stdio.h>
void heapsort(int a[20],int i, int n)
{
    int j,k,result = 1;
    k = a[i];
    j = 2*i;
    while((j <= n) && (result != 0))
    {
        if(j < n)
            if(a[j] > a[j+1])
                j = j+1;
        if(k < a[j])
            result = 0;
        else
        {
            a[j/2] = a[j];
            j = 2*j;
        }
        a[j/2] = k;
    }
}

int main()
{
    int n, a[50], i, t;
    printf("\n how many numbers : ");
    scanf("%d",&n);
    printf("\n enter the numbers : ");
    for (i=1; i<=n; i++)
        scanf("%d",&a[i]);
    for (i=n/2; i>=1; i--)
        heapsort(a,i,n);
    for (i=n-1; i>=1; i--)
    {
```

```
t = a[i+1];
a[i+1] = a[1];
a[1] = t;
heapsort(a,1,i);
}
printf("\n\n the sorted list is : ");
for(i = 1; i<=n;i++)
    printf("\t%d",a[i]);
return 0;
}
```

OUTPUT:

```
how many numbers : 5
enter the numbers : 56 23 75 12 90

the sorted list is :  90      75      56      23      12
```