**PROGRAM-9**

**AIM-** Write an algorithm and program to implement heap sort.

**ALGORITHM-**

void heapify(int arr[], int n, int i) {

// Find largest among root, left child and right child

int largest = i;

int left = 2 \* i + 1;

int right = 2 \* i + 2;

if (left < n && arr[left] > arr[largest])

largest = left;

if (right < n && arr[right] > arr[largest])

largest = right;

// Swap and continue heapifying if root is not largest

if (largest != i) {

swap(&arr[i], &arr[largest]);

heapify(arr, n, largest);

}

}

**SOURCE CODE-**

#include<stdio.h>

void create(int []);

void down\_adjust(int [],int);

void main()

{

int heap[30],n,i,last,temp;

printf("Enter no. of elements:");

scanf("%d",&n);

printf("\nEnter elements:");

for(i=1;i<=n;i++)

scanf("%d",&heap[i]);

//create a heap

heap[0]=n;

create(heap);

//sorting

while(heap[0] > 1)

{

//swap heap[1] and heap[last]

last=heap[0];

temp=heap[1];

heap[1]=heap[last];

heap[last]=temp;

heap[0]--;

down\_adjust(heap,1);

}

//print sorted data

printf("\nArray after sorting:\n");

for(i=1;i<=n;i++)

printf("%d ",heap[i]);

}

void create(int heap[])

{

int i,n;

n=heap[0]; //no. of elements

for(i=n/2;i>=1;i--)

down\_adjust(heap,i);

}

void down\_adjust(int heap[],int i)

{

int j,temp,n,flag=1;

n=heap[0];

while(2\*i<=n && flag==1)

{

j=2\*i; //j points to left child

if(j+1<=n && heap[j+1] > heap[j])

j=j+1;

if(heap[i] > heap[j])

flag=0;

else

{

temp=heap[i];

heap[i]=heap[j];

heap[j]=temp;

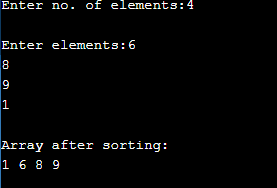
i=j;

}

}

}

**OUTPUT-**

****