Assignment no 10

Problem Statement :

Read the marks obtained by students of second year in an online examination of
particular subject. Find out maximum and minimum marks obtained in that subject. Use
heap data structure. Analyze the algorithm.

Program :

```
  #include<iostream>
#include<math.h> using
namespace std; # define
max1 20 class stud
{
          public:
         int marks[max1], total;
stud()
  {
  for(int i=0;i<max1;i++)      marks[i]=0;
  }
         void createHeap();      void
displayHeap();           void
showmax(); void showmin();

};
void stud::createHeap()
{
```

```
 int i,j,par,temp,M;  cout<<"\n Enter How many Stu
: ";   cin>>total; //5   for(i=0;i<total;i++)   //0-4=5
times
          {
                    cout<<"\n Enter Marks :  ";
cin>>marks[i];                    M=marks[i];
                    j=i;//j is child                    par=floor((j-1)/2);
              while(marks[j] < marks[par] && j!=0)
                      {
                              temp=marks[j];
 marks[j]=marks[par];
marks[par]=temp;                          j=par;
                                 par=floor((j-1)/2);
                              }
          cout<<"\n \n Current Heap : After Inserting : " <<M<<" is : \n "; displayHeap();
          }
}
void stud::displayHeap()
{
          int i=0,space=6;
cout<<endl; while(i<total)
{    if(i==0 || i==1 || i==3 || i==7 || i==15)
   {
   cout<<endl<<endl;    for(int
j=0;j<space;j++)        cout<<"
";    space-=2;
```

```
   }
  cout<<" "<<marks[i];i++;
      }
}
void stud::showmin()
{
          cout<<marks[0];
          }

void stud::showmax()
{
          int max,i;        max=marks[0];
             for(i=1;i<total;i++)
          {
                    if(max < marks[i])
                              max=marks[i];
          }
                   cout<<max;
          }

int main()
{
          stud s1;
int ch, ans;
```

```
        do
        {
        cout<<"\n 1. Insert Marks "; cout<<"\n 2.
Display Marks "; cout<<"\n 3. Show Max Marks ";
cout<<"\n 4. Show Min Marks ";      cout<<"\n\n
Enter Your Choice : ";
        cin>>ch;
switch(ch)
        {
                case 1:
s1.createHeap();
                        break;
                 case 2:
                                s1.displayHeap();
                                break;
                   case 3: s1.showmax();
                  break;
                    case 4: s1.showmin();
                  break;
                 }
              cout<<" \n Do u want to continue : (1 for continue )";
         cin>>ans;
}while(ans==1);

        return 0;
```

}

/*
OUTPUT----------
---

1. Insert Marks

2. Display Marks

3. Show Max Marks

4. Show Min Marks

Enter Your Choice : 1

Enter How many Stu : 6

Enter Marks : 50

Current Heap : After Inserting : 50 is :

50

0 0

0 0 0

Enter Marks : 40

Current Heap : After Inserting : 40 is :

40

50 0

0 0 0

Enter Marks : 30

Current Heap : After Inserting : 30 is : 30

50 40

0 0 0

Enter Marks : 20

Current Heap : After Inserting : 20 is :

20

30 40

50 0 0

Enter Marks : 10

Current Heap : After Inserting : 10 is : 10

20 40

50 30 0

Enter Marks : 70

Current Heap : After Inserting : 70 is :

10

20 40

50 30 70

Do u want to continue : (1 for continue)1

1. Insert Marks
2. Display Marks

3. Show Max Marks

4. Show Min Marks

Enter Your Choice : 2

10

20 40

50 30 70

Do u want to continue : (1 for continue)1

1. Insert Marks

2. Display Marks

3. Show Max Marks

4. Show Min Marks

Enter Your Choice : 3

70

Do u want to continue : (1 for continue)1

1. Insert Marks

2. Display Marks

3. Show Max Marks

4. Show Min Marks

Enter Your Choice : 4

10

Do u want to continue : (1 for continue) 2 */