```
#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 : 5

Enter Marks : 50

Current Heap : After Inserting : 50 is :

50

0 0

0 0

Enter Marks : 20

Current Heap : After Inserting : 20 is :

20

50 0

0 0

Enter Marks : 40

Current Heap : After Inserting : 40 is :

20

50 40

0 0

Enter Marks : 10

Current Heap : After Inserting : 10 is :

10

20 40

50 0
Enter Marks : 30

Current Heap : After Inserting : 30 is :

10

20 40

50 30
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
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
50
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)0
