

Group E

Title:- Create Heap Ddata structure For SE Student Marks

```
#include<iostream>
#define SIZE 10
using namespace std;
class Heap{
    int n;
    int Arry[SIZE];
public:
    Heap(){
        for(int i=0;i<SIZE;i++){
            Arry[i]=0;
        }
        n=0;
    }
    void insert(int);
    void MakeHeap();
    void HeapSort();
    void Display();
};

void Heap::insert(int Key){
    if(n<SIZE){
        Arry[n]=Key;
        n++;
        cout<<"\nInserted data is "<<Key<<" At "<<n<<" th Position\n";
    }
    else{
        cout<<"\n-----Array Is Full-----";
    }
}

void Heap::Display(){
    cout<<"\tINDEX\t||\tKey\n";
    for(int i=0;i<SIZE;i++){
        cout<<"\t"<<i<<"\t||"<<"\t"<<Arry[i]<<"\n";
    }
}

void Heap::HeapSort(){
    for(int i=n-1;i>0;i--){
        int temp=Arry[i];
        Arry[i]=Arry[0];
        int k=0,j=0;
        if(i==1){
            j=-1;
        }
    }
}
```

```

        else{
            j=1;
        }
        if(i>2 && Array[2]>Array[j]){
            j=2;
        }
        while(j>=0 && temp<Array[j]){
            Array[k]=Array[j];
            k=j;
            j=2*k+1;
            if(j+1<=i-1 && Array[j]<Array[j+1]){
                j++;
            }
            if(j>i-1){
                j=-1;
            }
            Array[k]=temp;
        }
    }
}

void Heap::MakeHeap(){
    for(int i=1;i<n;i++){
        int val=Array[i];
        int j=i;
        int p=(j-1)/2;
        while(j>0 && Array[p]<val){
            Array[j]=Array[p];
            j=p;
            p=(j-1)/2;
        }
        Array[j]=val;
    }
}

int main(){
    Heap H1;
    int key,choice=0;
    char ans;
    do{
        cout<<"\nMenu\n\t1.Insert\n\t2.MakeHeap\n\t3.Perform Heapsort\n\t4.Displa
y";

        cin>>choice;
        switch(choice){
            case 1: cout<<"\nEnter the data";
                    cin>>key;
                    H1.insert(key);

```

```

        break;
    case 2: cout<<"\n-----";
            H1.MakeHeap();
            break;
    case 3: cout<<"\n-----";
            H1.HeapSort();
            break;

    case 4:
            H1.Display();

    default:
            return 0;
    }
    cout<<"Do You Wants To continue?";
    cin>>ans;
}while (ans=='y' || ans=='Y');
{
    /* code */
}
}

```

Output:-

Menu

- 1.Insert
- 2.MakeHeap
- 3.Perform Heapsort
- 4.Display1

Enter the data12

Inserted data is 12 At 1 th Position

Do You Wants To continue?y

Menu

- 1.Insert
- 2.MakeHeap
- 3.Perform Heapsort
- 4.Display1

Enter the data30

Inserted data is 30 At 2 th Position

Do You Wants To continue?y

Menu

- 1.Insert
- 2.MakeHeap
- 3.Perform Heapsort
- 4.Display1

Enter the data78

Inserted data is 78 At 3 th Position

Do You Wants To continue?y

Menu

- 1.Insert
- 2.MakeHeap

3.Perform Heapsort

4.Display1

Enter the data69

Inserted data is 69 At 4 th Position

Do You Wants To continue?

y

Menu

1.Insert

2.MakeHeap

3.Perform Heapsort

4.Display1

Enter the data89

Inserted data is 89 At 5 th Position

Do You Wants To continue?y

Menu

1.Insert

2.MakeHeap

3.Perform Heapsort

4.Display2

-----Do You Wants To continue?y

Menu

1.Insert

2.MakeHeap

3.Perform Heapsort

4.Display4

| INDEX | | Key |
|-------|--|-----|
|-------|--|-----|

| | | |
|---|--|----|
| 0 | | 89 |
|---|--|----|

| | | |
|---|--|----|
| 1 | | 78 |
|---|--|----|

| | | |
|---|--|----|
| 2 | | 30 |
|---|--|----|

| | | |
|---|--|----|
| 3 | | 12 |
|---|--|----|

| | | |
|---|--|----|
| 4 | | 69 |
|---|--|----|

| | | |
|---|--|---|
| 5 | | 0 |
|---|--|---|

| | | |
|---|--|---|
| 6 | | 0 |
|---|--|---|

| | | |
|---|--|---|
| 7 | | 0 |
|---|--|---|

| | | |
|---|--|---|
| 8 | | 0 |
|---|--|---|

| | | |
|---|--|---|
| 9 | | 0 |
|---|--|---|