

ASSIGNMENT 22

```
#include <bits/stdc++.h>

using namespace std;

class Heap {
private:
    vector<int> min_heap;
    vector<int> max_heap;
    int size;

public:
    Heap(): size(-1) {}

    void heapify(int i, int m) {
        /*
        * m = 0: heapify minheap
        * m = 1 heapify maxheap
        */
        if ( m == 0 ) {
            while (min_heap[(i-1)/2] > min_heap[i]) {
                swap(min_heap[i], min_heap[(i-1)/2]);
                i = (i-1) / 2;
                if ( i == -1 )
                    break;
            }
        } else if ( m == 1 ) {
            while (min_heap[(i-1)/2] < min_heap[i]) {
                swap(max_heap[i], max_heap[(i-1)/2]);
                i = (i-1) / 2;
                if ( i == -1 )
```

```
        break;
    }
}
}
```

```
void insert(int marks) {
    min_heap.emplace_back(marks);
    max_heap.emplace_back(marks);
    size++;
    heapify(size, 0);
    heapify(size, 1);
}
```

```
inline int max() {
    return max_heap.front();
}
```

```
inline int min() {
    return min_heap.front();
}
};
```

```
int main() {
    Heap heap;

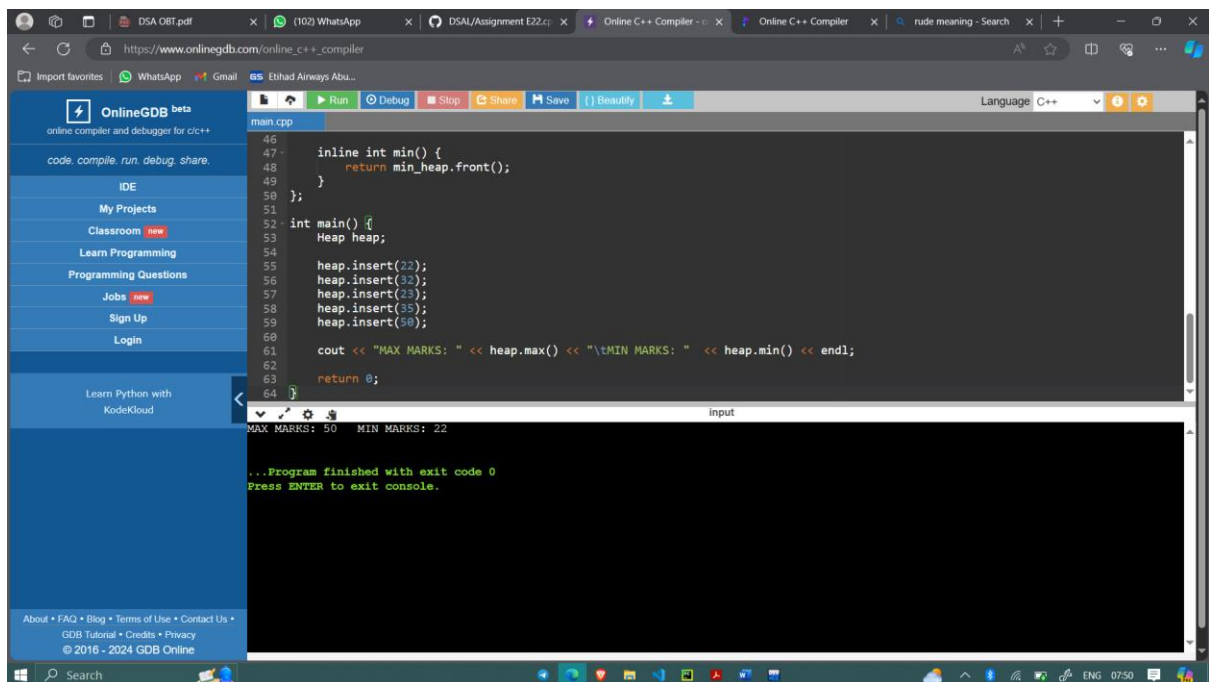
    heap.insert(22);
    heap.insert(32);
    heap.insert(23);
    heap.insert(35);
    heap.insert(50);
```

```
cout << "MAX MARKS: " << heap.max() << "\tMIN MARKS: " << heap.min() << endl;
```

```
return 0;
```

```
}
```

OUTPUT :



The screenshot displays the OnlineGDB web interface. The left sidebar contains navigation links such as 'IDE', 'My Projects', 'Classroom', 'Learn Programming', 'Programming Questions', 'Jobs', 'Sign Up', and 'Login'. The main editor area shows a C++ program in 'main.cpp' with line numbers 46 to 64. The code defines a min-heap and inserts elements 22, 23, 23, 35, and 50. The output console at the bottom shows 'MAX MARKS: 50' and 'MIN MARKS: 22'. The program finished with exit code 0.

```
46 inline int min() {
47     return min_heap.front();
48 }
49
50 };
51
52 int main() {
53     Heap heap;
54
55     heap.insert(22);
56     heap.insert(23);
57     heap.insert(23);
58     heap.insert(35);
59     heap.insert(50);
60
61     cout << "MAX MARKS: " << heap.max() << "\tMIN MARKS: " << heap.min() << endl;
62
63     return 0;
64 }
```

MAX MARKS: 50 MIN MARKS: 22

...Program finished with exit code 0
Press ENTER to exit console.