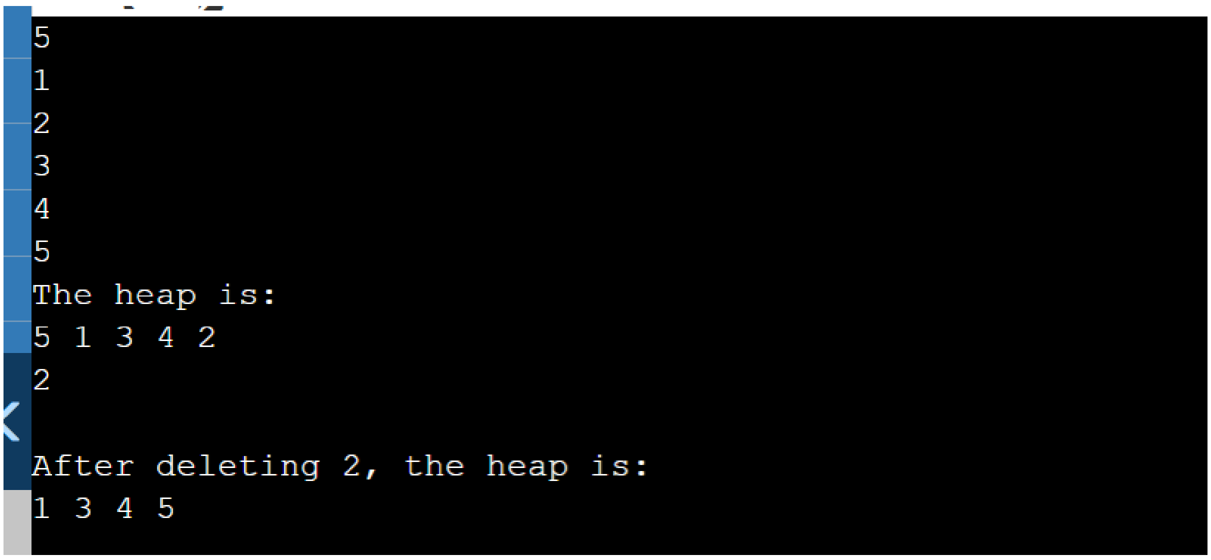
```cpp
#include <iostream>
#include <bits/stdc++.h>
using namespace std;

struct Node {
    int val, degree;
    Node *parent, *child, *sibling;
};
Node *root = NULL;

void binomialLink(Node *h1, Node *h2) {
    h1 -> parent = h2;
    h1 -> sibling = h2 -> child;
    h2 -> child = h1;
    h2 -> degree = h2 -> degree + 1;
}

Node *createNode(int n) {
    Node *new_node = new Node;
    new_node -> val = n;
    new_node -> parent = NULL;
    new_node -> sibling = NULL;
    new_node -> child = NULL;
    new_node -> degree = 0;
    return new_node;
}

Node *mergeBHeaps(Node *h1, Node *h2) {
    if (h1 == NULL) return h2;
    if (h2 == NULL) return h1;

    Node *res = NULL;

    if (h1 -> degree <= h2 -> degree) res = h1;

    else if (h1 -> degree > h2 -> degree) res = h2;

    while (h1 != NULL && h2 != NULL) {
        if (h1 -> degree < h2 -> degree) h1 = h1 -> sibling;

        else if (h1 -> degree == h2 -> degree) {
            Node *sib = h1 -> sibling;
            h1 -> sibling = h2;
            h1 = sib;
        }
        else {
            Node *sib = h2 -> sibling;
            h2 -> sibling = h1;
            h2 = sib;
        }
    }
    return res;
}

Node *unionBHeaps(Node *h1, Node *h2) {
    if (h1 == NULL && h2 == NULL) return NULL;

    Node *res = mergeBHeaps(h1, h2);

    Node *prev = NULL, *curr = res, *next = curr->sibling;
    while (next != NULL) {
        if ((curr -> degree != next -> degree) || ((next->sibling != NULL) &&
(next->sibling)->degree == curr->degree)) {
            prev = curr;
            curr = next;
        } else {
            if (curr -> val <= next -> val) {
                curr -> sibling = next -> sibling;
                binomialLink(next, curr);
            } else {
                if (prev == NULL) res = next;
                else prev -> sibling = next;
                binomialLink(curr, next);
                curr = next;
            }
        }
        next = curr -> sibling;
    }
    return res;
}

void binomialHeapInsert(int x) {
    root = unionBHeaps(root, createNode(x));
}

void display(Node *h) {
    while (h) {
        cout << h -> val << " ";
        display(h -> child);
        h = h -> sibling;
    }
}

void revertList(Node *h) {
    if (h -> sibling != NULL) {
        revertList(h -> sibling);
        (h -> sibling) -> sibling = h;
    } else root = h;
}

Node *extractMinBHeap(Node *h) {
    if (h == NULL) return NULL;

    Node *min_node_prev = NULL;
    Node *min_node = h;

    int min = h -> val;
    Node *curr = h;
    while (curr -> sibling != NULL) {
        if ((curr -> sibling) -> val < min) {
            min = (curr -> sibling) -> val;
            min_node_prev = curr;
            min_node = curr -> sibling;
        }
        curr = curr -> sibling;
    }
    if (min_node_prev == NULL && min_node -> sibling == NULL) h = NULL;

    else if (min_node_prev == NULL) h = min_node -> sibling;

    else min_node_prev -> sibling = min_node -> sibling;

    if (min_node -> child != NULL) {
        revertList(min_node -> child);
        (min_node -> child) -> sibling = NULL;
    }

    return unionBHeaps(h, root);
}

Node *findNode(Node *h, int val) {
    if (h == NULL) return NULL;

    if (h -> val == val) return h;

    Node *res = findNode(h -> child, val);
    if (res != NULL) return res;

    return findNode(h -> sibling, val);
}

void decreaseKeyBHeap(Node *H, int old_val, int new_val) {
    Node *node = findNode(H, old_val);
    if (node == NULL) return;
    node -> val = new_val;
    Node *parent = node -> parent;

    while (parent != NULL && node -> val < parent -> val) {
        swap(node -> val, parent -> val);
        node = parent;
        parent = parent -> parent;
    }
}

Node *binomialHeapDelete(Node *h, int val) {
    if (h == NULL) return NULL;
    decreaseKeyBHeap(h, val, INT_MIN);
    return extractMinBHeap(h);
}

int main() {
    int n;
    cin >> n;
    for (int i = 0; i < n; ++i) {
      int k;
      cin >> k;
      binomialHeapInsert(k);
    }

    cout << "The heap is:\n";
    display(root);
    cout << "\n";
    int m;
    cin >> m;
    root = binomialHeapDelete(root, m);

    cout << "\nAfter deleting " << m << ", the heap is:\n";

    display(root);

    return 0;
}
```

OUTPUT:



```
5
1
2
3
4
5
The heap is:
5 1 3 4 2
2

After deleting 2, the heap is:
1 3 4 5
```