WEEK – 9 .

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E – 26

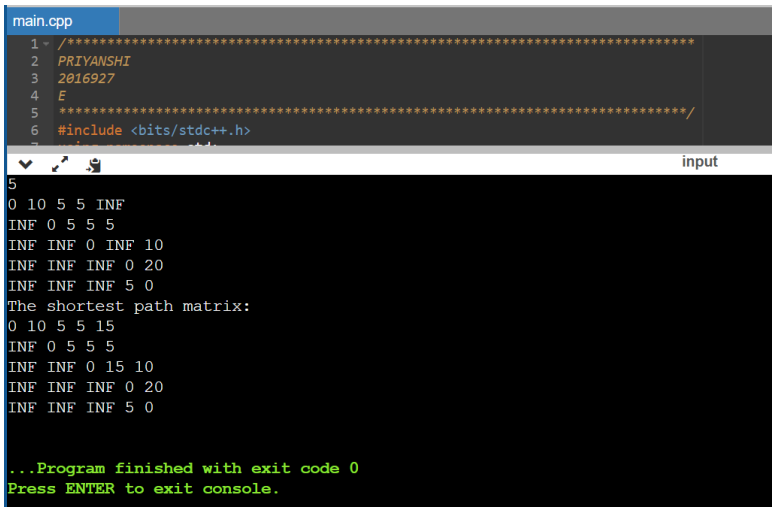
Q1.

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


int main() {
    int n, i, j, k, w;
    cin >> n;
    int graph[n][n];
    string temp;
    for (i = 0; i < n; i++) {
        for (j = 0; j < n; j++) {
            cin >> temp;
            if (temp != "INF") {
                graph[i][j] = stoi(temp);
            } else {
                graph[i][j] = 1e8;
            }
        }
    }
    for (k = 0; k < n; k++) {
        for (i = 0; i < n; i++) {
```

```
            for (j = 0; j < n; j++) {
                if (graph[i][k] + graph[k][j] < graph[i][j]) {
                    graph[i][j] = graph[i][k] + graph[k][j];
                }
            }
        }
    }
    cout << "The shortest path matrix: " << endl;
    for (i = 0; i < n; i++) {
        for (j = 0; j < n; j++) {
            if(graph[i][j] >= 1e8) cout << "INF";
            else cout << graph[i][j];
            cout << " ";
        }
        cout << endl;
    }
    return 0;
}
```

OUTPUT



Q2.

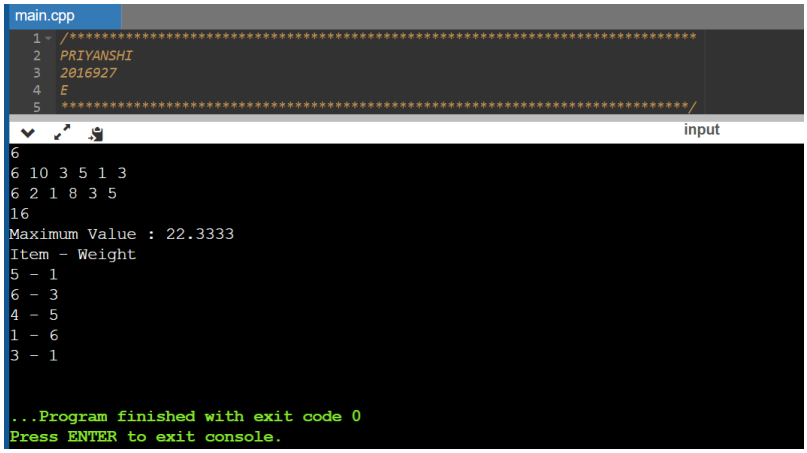
```
#include <bits/stdc++.h>

using namespace std;


int main() {
    int n;
    cin >> n;
    vector<double> items(n);
    vector<double> val(n);
    vector<vector<double>> job;
    for (int i = 0; i < n; i++) {
        cin >> items[i];
    }
    for (int i = 0; i < n; i++) {
        cin >> val[i];
        job.push_back({val[i] / items[i], items[i], (double)(i + 1)});
    }
    double k;
```

```
    cin >> k;
    sort(job.rbegin(), job.rend());
    vector<pair<double, double>> ls;
    float profit = 0;
    for (int i = 0; i < n; i++) {
        if (job[i][1] >= k) {
            profit += k * job[i][0];
            ls.push_back(make_pair(k, job[i][2]));
            break;
        } else {
            profit += job[i][1] * job[i][0];
        }
        ls.push_back(make_pair(job[i][1], job[i][2]));
        k = k - job[i][1];
    }
    cout << "Maximum Value : " << profit << endl;
    cout << "Item - Weight" << endl;
    for (auto it : ls)
        cout << it.second << " - " << it.first << endl;
    return 0;
}
```

OUTPUT



Q3.

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

using namespace std;


int main() {
    int n;
    cin >> n;
    vector<int> a(n);
    for (int i = 0; i < n; i++) {
        cin >> a[i];
    }
    priority_queue<int, vector<int>, greater<int>> minheap;
    for (int i = 0; i < n; i++) {
        minheap.push(a[i]);
    }
    int ans = 0;
    while (minheap.size() >1) {
        int e1 = minheap.top();
        minheap.pop();
```

```
        int e2 = minheap.top();
        minheap.pop();
        ans += e1 + e2;
        minheap.push(e1 + e2);
    }
    cout << ans;
    return 0;
}
```

OUTPUT