

### Max Flow:

```
// Adjacency list implementation of Dinic's blocking flow algorithm.
// This is very fast in practice, and only loses to push-relabel flow.
//
// Running time:
//       $O(|V|^2 |E|)$ 
//
// INPUT:
//      - graph, constructed using AddEdge()
//      - source
//      - sink
//
// OUTPUT:
//      - maximum flow value
//      - To obtain the actual flow values, look at all edges with
//        capacity > 0 (zero capacity edges are residual edges).
```

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

```
#define clr(a) (a.clear())
#define sz(x) (int)x.size()
#define pb push_back
```

```
const int INF = 2000000000;
```

```
struct Edge {
    int from, to, cap, flow, index;
    Edge(int from, int to, int cap, int flow, int index) :
        from(from), to(to), cap(cap), flow(flow), index(index) {}
};
```

```
struct Dinic
{
```

```
    int N;
    vector<vector<Edge> > G;
    vector<Edge *> dad;
    vector<int> Q;
```

```
    Dinic(int N) : N(N), G(N), dad(N), Q(N) {}
```

```
    void AddEdge(int from, int to, int cap) {
        G[from].push_back(Edge(from, to, cap, 0, G[to].size()));
        if (from == to) G[from].back().index++;
        G[to].push_back(Edge(to, from, 0, 0, G[from].size() - 1));
    }
```

```
    long long BlockingFlow(int s, int t) {
        fill(dad.begin(), dad.end(), (Edge *) NULL);
        dad[s] = &G[0][0] - 1;

        int head = 0, tail = 0;
```

```

    Q[tail++] = s;
    while (head < tail) {
        int x = Q[head++];
        for (int i = 0; i < G[x].size(); i++) {
            Edge &e = G[x][i];
            if (!dad[e.to] && e.cap - e.flow > 0) {
                dad[e.to] = &G[x][i];
                Q[tail++] = e.to;
            }
        }
    }
    if (!dad[t]) return 0;

    long long totflow = 0;
    for (int i = 0; i < G[t].size(); i++) {
        Edge *start = &G[G[t][i].to][G[t][i].index];
        int amt = INF;
        for(Edge *e=start; amt&&e!=dad[s]; e=dad[e->from]){
            if (!e) {
                amt = 0;
                break;
            }
            amt = min(amt, e->cap - e->flow);
        }
        if (amt == 0) continue;
        for(Edge *e=start; amt&&e!=dad[s]; e=dad[e->from]){
            e->flow += amt;
            G[e->to][e->index].flow -= amt;
        }
        totflow += amt;
    }
    return totflow;
}

long long GetMaxFlow(int s, int t) {
    long long totflow = 0;
    while (long long flow = BlockingFlow(s, t))
        totflow += flow;
    return totflow;
}

};

int main()
{
    int n, m;  cin >> n >> m;
    vector <int> a(n + 1), b(n + 1);
    int tot1 = 0;
    for (int i = 1; i <= n; i++) {
        cin >> a[i];
        tot1 += a[i];
    }
}

```

```

int tot2 = 0;
for (int i = 1; i <= n; i++) {
    cin >> b[i];
    tot2 += b[i];
}
int src = 0, snk = n + n + 1;

Dinic din(n + n + 2);

for (int i = 1; i <= n; i++) {
    din.AddEdge(src, i, a[i]);
    din.AddEdge(i, i + n, INF);
}
for (int i = 1; i <= n; i++) {
    din.AddEdge(i + n, snk, b[i]);
}
for(int i = 0; i < m; i++) {
    int from, to;
    cin >> from >> to;
    din.AddEdge(from, to + n, INF);
    din.AddEdge(to, from + n, INF);
}

int Flow = din.GetMaxFlow(src, snk);
//cerr << "Flow = " << Flow << endl;

if (Flow == tot1 && Flow == tot2) {
    cout << "YES" << endl;
    int ans[n + 1][n + 1];
    memset (ans, 0, sizeof ans);
    for (int i = 1; i <= n; i++) {
        for (int j = 0; j < sz(din.G[i]); j++) {
            int to = din.G[i][j].to - n;
            if (to >= 1 && to <= n) {
                ans[i][to] = din.G[i][j].flow;
            }
        }
    }
    for (int i = 1; i <= n; i++) {
        for (int j = 1; j <= n; j++) {
            cout << ans[i][j] << ' ';
        }
        cout << endl;
    }
}
else{
    cout << "NO" << endl;
}

return 0;
}

```