

Program

```
#include <stdio.h>

struct node {
    unsigned dist[20];
    unsigned from[20];
} rt[10];

int main() {
    int demat[20][20];
    int n, i, j, k, count = 0;

    printf("Enter the number of nodes: ");
    scanf("%d", &n);

    printf("Enter the cost matrix (999 for no link):\n");
    for (i = 0; i < n; i++) {
        for (j = 0; j < n; j++) {
            scanf("%d", &demat[i][j]);
            if (i == j)
                demat[i][j] = 0;
            rt[i].dist[j] = demat[i][j];
            rt[i].from[j] = j;
        }
    }

    do {
        count = 0;
        for (i = 0; i < n; i++) {
            for (j = 0; j < n; j++) {
                for (k = 0; k < n; k++) {
                    if (rt[i].dist[j] > demat[i][k] + rt[k].dist[j]) {
                        rt[i].dist[j] = demat[i][k] + rt[k].dist[j];
                        rt[i].from[j] = k;
                        count++;
                    }
                }
            }
        }
    } while (count != 0);

    for (i = 0; i < n; i++) {
        printf("\n\nState value for router %d is\n\n", i + 1);
        for (j = 0; j < n; j++) {
            printf("\tNode %d via %d Distance %d\n", j + 1, rt[i].from[j] + 1, rt[i].dist[j]);
        }
    }
    printf("\n\n");

    return 0;
}
```

Output



cek21cs049@ltsp791: ~/s6network

```
cek21cs049@ltsp791:~/s6networklab$ ./a.out
```

```
Enter the number of nodes: 4
```

```
Enter the cost matrix (999 for no link):
```

```
0 2 999 1
```

```
2 0 3 7
```

```
999 3 0 11
```

```
1 7 11 0
```

```
State value for router 1 is
```

```
Node 1 via 1 Distance 0
```

```
Node 2 via 2 Distance 2
```

```
Node 3 via 2 Distance 5
```

```
Node 4 via 4 Distance 1
```

```
State value for router 2 is
```

```
Node 1 via 1 Distance 2
```

```
Node 2 via 2 Distance 0
```

```
Node 3 via 3 Distance 3
```

```
Node 4 via 1 Distance 3
```

```
State value for router 3 is
```

```
Node 1 via 2 Distance 5
```

```
Node 2 via 2 Distance 3
```

```
Node 3 via 3 Distance 0
```

```
Node 4 via 2 Distance 6
```

```
State value for router 4 is
```

```
Node 1 via 1 Distance 1
```

```
Node 2 via 1 Distance 3
```

```
Node 3 via 1 Distance 6
```

```
Node 4 via 4 Distance 0
```