

Title : Write a program to implement link state/distance vector routing protocol to find suitable path for transmission

Subject :- Computer Networks and Security Laboratory

Date :-

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Code:-

```
#include <iostream>
#include <stdio.h>
using namespace std;

struct node {
    int dist[20];
    int from[20];
} route[10];

int main()
{
    int dm[20][20], no;
    cout << "Enter no of nodes." << endl;
    cin >> no;
    cout << "Enter the distance matrix:" << endl;
    for (int i = 0; i < no; i++) {
        for (int j = 0; j < no; j++) {
            cin >> dm[i][j];
            /* Set distance from i to i as 0 */
            dm[i][i] = 0;
            route[i].dist[j] = dm[i][j];
            route[i].from[j] = j;
        }
    }

    int flag;
    do {
        flag = 0;
        for (int i = 0; i < no; i++) {
            for (int j = 0; j < no; j++) {
                for (int k = 0; k < no; k++) {
                    if ((route[i].dist[j]) > (route[i].dist[k] + route[k].dist[j])) {
                        route[i].dist[j] = route[i].dist[k] + route[k].dist[j];
                        route[i].from[j] = k;
                        flag = 1;
                    }
                }
            }
        }
    }
}
```

```

    }
} while (flag);
for (int i = 0; i < no; i++) {
    cout << "Router info for router: " << i + 1 << endl;
    cout << "Dest\tNext Hop\tDist" << endl;
    for (int j = 0; j < no; j++)
        printf("%d\t%d\t%d\n", j+1, route[i].from[j]+1, route[i].dist[j]);
}
return 0;
}

```

Output:-

```

dvr.cpp > ...
1 #include <iostream>
2 #include <stdio.h>

PS C:\Users\harsh\Downloads\CNS Practical\output> cd 'c:\Users\harsh\Downloads\CNS Practical\output'
PS C:\Users\harsh\Downloads\CNS Practical\output> & .\dvr.exe
Enter no of nodes.
4
Enter the distance matrix:
0 2 7 999
2 0 999 1
7 999 0 3
999 1 3 0
Router info for router: 1
Dest    Next Hop    Dist
1        1            0
2        2            2
3        2            6
4        2            3
Router info for router: 2
Dest    Next Hop    Dist
1        1            2
2        2            0
3        4            4
4        4            1
Router info for router: 3
Dest    Next Hop    Dist
1        2            6
2        4            4
3        3            0
4        4            3
Router info for router: 4
Dest    Next Hop    Dist
1        2            3
2        2            1
3        3            3
4        4            0
PS C:\Users\harsh\Downloads\CNS Practical\output>

```