**Program 2: Write a program to implement distance vector routing protocol for a simple topology of routers.**

//touch di.c

//gcc di.c -o di

//./di

#include<stdio.h>

struct node

{

unsigned dist[20];

unsigned from[20];

}rt[10];

int main()

{

int costmat[20][20];

int nodes,i,j,k,count=0;

printf("\nEnter the number of nodes : ");

scanf("%d",&nodes);//Enter the nodes

printf("\nEnter the cost matrix :\n");

for(i=0;i<nodes;i++)

{

for(j=0;j<nodes;j++)

{

scanf("%d",&costmat[i][j]);

costmat[i][i]=0;

rt[i].dist[j]=costmat[i][j];//initialise the distance equal to cost matrix//

rt[i].from[j]=j;

}

}

do

{

count=0;

for(i=0;i<nodes;i++)

//We choose arbitary vertex k and we calculate the direct distance from the node i to k using the cost matrix

//and add the distance from k to node j

for(j=0;j<nodes;j++)

for(k=0;k<nodes;k++)

if(rt[i].dist[j]>costmat[i][k]+rt[k].dist[j])

{//We calculate the minimum distance

rt[i].dist[j]=rt[i].dist[k]+rt[k].dist[j];

rt[i].from[j]=k;

count++;

}

}while(count!=0);

for(i=0;i<nodes;i++)

{

printf("\n\n For router %d\n",i+1);

for(j=0;j<nodes;j++)

{

printf("\t\nnode %d via %d Distance %d ",j+1,rt[i].from[j]+1,rt[i].dist[j]);

}

}

printf("\n\n");

getchar();

}

