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//B20CS1130
//Experiment 10
//Distance Vector Routing

#include <stdio.h>
struct{
	unsigned dist[20];
	unsigned from[20];
}rt[10];
int main(){
	int dmat[20][20],n,i,j,k,count=0;
	printf("Enter number of nodes: ");
	scanf("%d",&n);
	printf("Enter the cost matrix:\n");
	for(i=0;i<n;i++){
		for(j=0;j<n;j++){
			scanf("%d",&dmat[i][j]);
			dmat[i][i]=0;
			rt[i].dist[j]=dmat[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]>dmat[i][k]+rt[k].dist[j]){
			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<n;i++){
		printf("\nState value for router %d is \n",i+1);
		for(j=0;j<n;j++){
			printf("\t\nnode %d via %d distance %d",j+1,rt[i].from[j]+1,rt[i].dist[j]);
		}
		printf("\n\n");
	}
}
```

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/*
OUTPUT
s6cs130@comp62:~$ gcc 10.dvr.c
s6cs130@comp62:~$ ./a.out
Enter number of nodes: 4
Enter the cost matrix:
0 3 99 99
3 0 1 8
99 1 0 4
99 8 4 0

State value for router 1 is

node 1 via 1 distance 0
node 2 via 2 distance 3
node 3 via 2 distance 4
node 4 via 2 distance 8

State value for router 2 is

node 1 via 1 distance 3
node 2 via 2 distance 0
node 3 via 3 distance 1
node 4 via 3 distance 5

State value for router 3 is

node 1 via 2 distance 4
node 2 via 2 distance 1
node 3 via 3 distance 0
node 4 via 4 distance 4

State value for router 4 is

node 1 via 3 distance 8
node 2 via 3 distance 5
node 3 via 3 distance 4
node 4 via 4 distance 0
*/
```