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//Created By Ritwik Chandra Pandey
//On 5th Nov' 2021
//Floyd - Warshall's All pairs shortest path algorithm



#include<stdio.h>
#define INF 99999
int graph[20][20];
int N,E;
void printSolution(int dist[][N]);
void floydWarshall () {
int dist[N][N];
 int i,j,k;
 for(i=1;i<=N;i++){
        for(j=1;j<=N;j++){
                if(i==j){
                        dist[i][j] = 0;
                }else{
                        dist[i][j] = graph[i][j];
                }
        }
 }
 for(k=1;k<=N;k++){
        for(i=1;i<=N;i++){
                for(j=1;j<=N;j++){
                        if(dist[i][k] + dist[k][j] < dist[i][j]){
                                dist[i][j] = dist[i][k] + dist[k][j];
                        }
                }
        }
 }




        printSolution(dist);
}
void printSolution(int dist[][N]) {
        printf ("The following matrix shows the shortest distances between all pairs of the vertices.\n");
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	for (int i = 1; i <= N; i++) {
		for (int j = 1; j <= N; j++) {
			if (dist[i][j] == INF)
				printf("%5s", "INF");
			else
				printf ("%5d", dist[i][j]);
		}
		printf("\n");
	}
}
int main() {
	int s,d,w,i,j;
	printf("Enter the number of vertices : ");
	scanf("%d",&N);
	printf("Enter the number of edges : ");
	scanf("%d",&E);
	for(i = 1 ; i <= N;i++) {
		for(j = 1 ; j <= N ;j++ ) {
			graph[i][j] = INF;
		}
	}
	for(i=1;i<=E;i++) {
		printf("Enter source : ");
		scanf("%d",&s);
		printf("Enter destination : ");
		scanf("%d",&d);
		printf("Enter weight : ");
		scanf("%d",&w);
		if(s > N || d > N || s<=0 || d<=0) {
			printf("Invalid index. Try again.\n");
			i--;
			continue;
		} else {
			graph[s][d] = w;
		}
	}
	floydWarshall();
	return 0;
}
```