1. From a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra’s algorithm.

#include <stdio.h>  
void main()  
{  
int i,j,n,v,k,min,u,c[20][20],s[20],d[20];  
printf("Enter the no. of vertices : ");  
scanf("%d",&n);  
printf("Enter the cost adjacency matrix : ");  
printf("Enter 999 for no edge ");  
for(i=1;i<=n;i++)  
{  
for(j=1;j<=n;j++)  
{  
scanf("%d",&c[i][j]);  
}  
}  
printf("Enter the source vertex : ");  
scanf("%d",&v);  
for(i=1;i<=n;i++)  
{  
s[i]=0;  
d[i]=c[v][i];  
}  
d[v]=0;  
s[v]=1;  
for(k=2;k<=n;k++)  
{  
min=999;  
for(i=1;i<=n;i++)  
{  
if((s[i]==0)&& (d[i]< min))  
{  
min=d[i];  
u=i;  
}  
}  
s[u]=1;  
for(i=1;i<=n;i++)  
{  
  
if(s[i]==0)  
{  
if(d[i]>(d[u]+c[u][i]))  
{  
d[i]=d[u]+c[u][i];  
}  
}  
}  
}  
printf("The shortest distance from %d is ",v);  
for(i=1;i<=n;i++)  
{  
printf("\n %d --> %d = %d ",v,i,d[i]);  
}  
}

Output:

