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#include <stdio.h>

int main()

 {

  int min,i,j,nv,current,source,dest,T,y,x,v,c;

  int max=1000;

  int hi=1;

  int visited[50],path[50],distance[50],adj[50][50];

  printf("Enter the number of vertices in the graph:\n");

  scanf("%d",&v);

  printf("Enter the adjacnecy matrix:\n");

  for(i=1;i<=v;i++)

    for(j=1;j<=v;j++)

      scanf("%d",&adj[i][j]);

  for(i=1;i<=v;i++)

  {

    distance[i]=max;

    visited[i]=0;

    path[i]=0;

  }

  printf("Enter the source vertex:\n");

  scanf("%d",&source);

  current=source;

  visited[current]=1;

  nv=1;

  T=0;

  while(nv!=v)

  {

    for(i=1;i<=v;i++)

    {

      if(adj[current][i]!=0)

        if(visited[i]!=hi)

          if(distance[i]>adj[current][i]+T)

          {

            distance[i]=adj[current][i] +T;

            path[i]=current;

          }

    }

    min=max;

    for(i=1;i<=v;i++)

     if(visited[i]!=hi)

      if(distance[i]<min)

      {

        min=distance[i];

        current =i;

      }

      visited[current]=1;

      nv++;

      T=distance[current];

  }

  printf("Enter the destination vertex:\n");

  scanf("%d",&dest);

  printf("Shortest distance from source to destination is %d\n",distance[dest]);

  printf("Shortest path between source %d and destination %d is:\n",source,dest);

  y=dest;

  do{

    i=2;

    x=path[y];

    printf("%d --> %d\n",x,y);

    y=x;

  }while(y!=source);

  return 0;

}



