PROGRAM CODE

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#include <stdio.h>
#include <limits.h>

struct node {
      int dist[100];
      int from[100];
};

int path(int src, int i, int from[]) {
      int temp;

      while(1) {
            temp = i;
            i = from[i];

            if(temp == i)
                  break;
      }

      return temp;
}

void main() {
      int nodes;

      printf("Enter the number of nodes: ");
      scanf("%d", &nodes);
      int costmat[nodes][nodes];

      struct node rt[nodes];

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

      for(int i = 0; i < nodes; i++) {
            for(int j = 0; j < nodes; j++) {
                  scanf("%d", &costmat[i][j]);

                  if(costmat[i][j] == -1)
                        costmat[i][j] = SHRT_MAX;

                  rt[i].dist[j] = costmat[i][j];
                  rt[i].from[j] = j;
            }

            costmat[i][i] = 0;
      }

      int count;

      do {
            count = 0;

            for(int i = 0; i < nodes; i++)
                  for(int j = 0; j < nodes; j++)
                              for(int k = 0; k < nodes; k++)
                              if(rt[i].dist[j] > costmat[i][k] + rt[k].dist[j])
{
                                    rt[i].dist[j] = rt[i].dist[k] +
rt[k].dist[j];
                                    rt[i].from[j] = k;
                                    count++;
```

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                                }
        } while(count != 0);

      for(int i = 0; i < nodes; i++) {
            printf("\nFor router %d\n",i + 1);

            for(int j = 0; j < nodes; j++) {
                  printf("\nShortest distance to router %d is %d via %d", j + 1,
rt[i].dist[j], path(i, j, rt[i].from) + 1);
            }

            printf("\n");
        }
}
```

OUTPUT