Data Structure Assignment 8

Programming Homework

Use Program 6.12 on Figure 1. to find the shortest path from node *i* to node *j*.

(a) Calculate the distance of the shortest path from node *i* to node *j* and print it out.
(b) Print out the route for the shortest path.

```
void allCosts(int cost[][MAX_VERTICES],
              int distance[][MAX_VERTICES], int n)
{/* compute the shortest distance from each vertex
    to every other, cost is the adjacency matrix,
    distance is the matrix of computed  distances */
  int i,j,k;
  for (i = 0; i < n; i++)
    for (j = 0; j < n; j++)
      distance[i][j] = cost[i][j];
  for (k = 0; k < n; k++)
    for (i = 0; i < n; i++)
      for (j = 0; j < n; j++)
        if (distance[i][k] + distance[k][j] <
                                        distance[i][j])
          distance[i][j] =
          distance[i][k] + distance[k][j];
}
```

Program 6.12: All pairs, shortest paths function

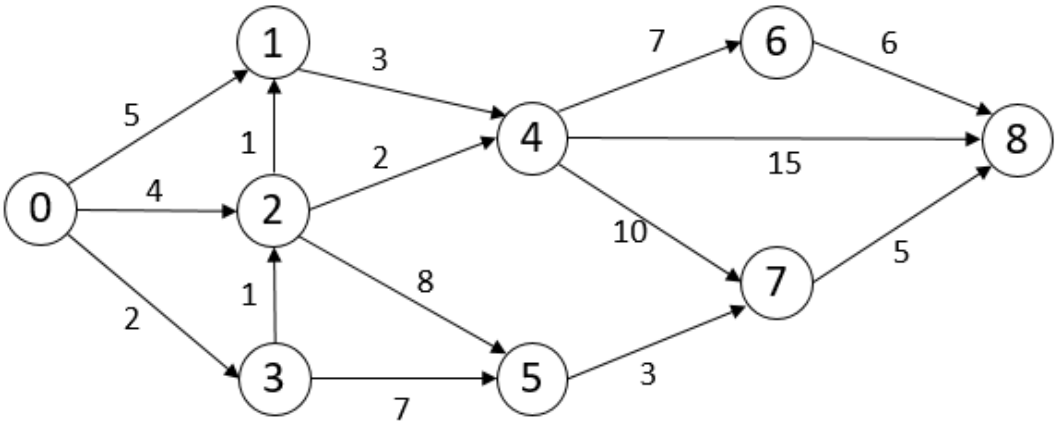

Figure. 1.

Sample input (1):

(i, j)

0 2

Sample output (1):

Distance : 3

The route for the shortest path : 0→3→2

Sample input (2):

2 7

Sample output (2):

Distance : 11

The route for the shortest path : 2→5→7

Sample input (3):

0 6

Sample output (3):

Distance : 12

The route for the shortest path : 0→3→2→4→6

Sample input (4):

0 8

Sample output (4):

Distance : 17

The route for the shortest path : 0→3→5→7→8

Sample input (5):

8 4

Sample output (5):

No solution

General Information:

- Deadline：**2018/01/05 23:55**.
- Upload your assignment to Moodle system.
- Upload file format: Student-Id_Name.rar , Ex.P76991094_王小明.rar
- Your file should consist of the following items: Source Code & Readme file (Program description).
- Late homework will not be accepted.
- Any copies will be scored as zero. Do not plagiarize.
- Programming homework TA 傅瑄方 Email: p76051226@mail.ncku.edu.tw