IJCSI International Journal of Computer Science Issues, Vol. 10, Issue 2, No 1, March 2013
ISSN (Print): 1694-0814 | ISSN (Online): 1694-0784
www.IJCSI.org

Erratum to: Adjacency Matrix based method to compute the node connectivity of a Computer Communication Network

Onur Ugurlu[1] and Murat Ersen Berberler[2]

[1] **Department of Mathematics, Ege University**
Izmir, 35100, Turkey

[2] **Department of Computer Science, Dokuz Eylul University**
Izmir, 35160, Turkey

Abstract

This note indicates that the algorithm, which has been proposed by Kamalesh Srivatsa in Adjacency Matrix based method to compute the node connectivity of a Computer Communication Network, is incorrect.

Keywords: *Node Connectivity, Computation, Adjacency Matrix, Network.*

1. Introduction

In “Adjacency Matrix based method to compute the node connectivity of a Computer Communication Network”, Kamalesh and Srivatsa [1] have proposed a method to compute the connectivity number κ of a given computer communication network. We show that the proposed method does not compute the κ correctly for some graph. An example for this type graph is shown in the next section.

2. The Counter Example

The counter example of the algorithm as follows:

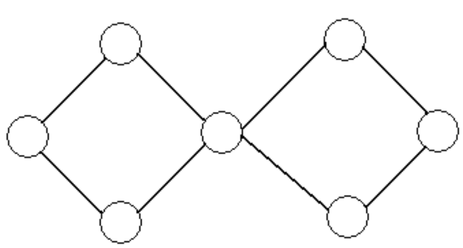

Fig. 1 network graph.

The nodes are numbered using the method [2]. The adjacency matrix of the graph is:

Table 1: Adjacency matrix of the graph

Nodes	1	2	3	4	5	6	7
1	-	1	1	0	0	1	1
2	-	-	0	1	0	0	0
3	-	-	-	0	1	0	0
4	-	-	-	-	0	1	0
5	-	-	-	-	-	0	1
6	-	-	-	-	-	-	0
7	-	-	-	-	-	-	-

For the given network graph, the degree d is 2. L_1={1,2,3}. Corresponding to the nodes of L_1, create counters A[1], A[2] and A[3] respectively and initialize them to zero, i.e.,
A[1]=0, A[2]=0, A[3]=0.

Form the set L_2 consisting of remaining nodes of the given network N(V,E), i.e., L_2={4,5,6,7}. Corresponding to the nodes of L_2, create counters B[4], B[5], B[6], B[7] and initialize them to zero, i.e.,
B[4]=0 , B[5]=0. B[6]=0 , B[7]=0.

Starting from node 1, check for the adjacency of node 1 with every other node.

Here, node 1 is adjacent to node 2. Increment the counters A[1] and A[2] by 1 respectively, i.e.,
A[1] = 0+1 =1
A[2] = 0+1 =1

Next, node 1 is adjacent to node 3. Hence, increment A[1] and A[3] by 1 respectively, i.e.,
A[1] = 1+1 =2
A[3] = 0+1 =1

Next, node 1 is adjacent to node 6. Hence, increment A[1] and B[6] by 1 respectively, i.e.,
A[1] = 2+1 =3
B[6] = 0+1 =1

Node 1 is also adjacent to node 7. Hence, increment A[1] and B[7] by 1 respectively, i.e.,
A[1] = 3+1 =4
B[7] = 0+1 =1

Check for the adjacency of node 2. Here, node 2 is adjacent to node 4. Therefore, increment A[2] and B[4] by 1, i.e.,
A[2] = 1+1 =2
B[4] = 0+1 =1

Check for the adjacency of node 3. Here, node 3 is adjacent to node 5. Hence increment A[3] and B[5] by 1, i.e.,
A[3]=1+1=2
B[5]=0+1=1

Check for the adjacency of node 4. Node 4 is adjacent to node 6. Hence increment B[4] and B[6] by 1, i.e.,
B[4]=1+1=2
B[6]=1+1=2

Check for the adjacency of node 5. Node 5 is adjacent to node 7. Hence increment B[5] and B[7] by 1, i.e.,
B[5]=1+1=2
B[7]=1+1=2

After checking all the nodes for their adjacencies, now check the values stored in the counters corresponding to the nodes of the given network.

A[1] = 4
A[2] = 2
A[3] = 2
B[4] = 2
B[5] = 2
B[6] = 2
B[7] = 2

The minimum amongst the values stored in the counters corresponding to all the nodes of the given network is 2. Hence, the network is 2-connected according to the algorithm.

But as one can see, the network is 1-connected. This example shows that the algorithm is not work correctly.

3. Conclusions

In this paper, with the aid of the counter example we show that the node connectivity algorithm which has been proposed by Kamalesh and Srivatsa, is incorrect.

References

[1] Kamalesh V. N and S. K. Srivatsa, Adjacency Matrix based method to compute the node connectivity of a Computer Communication Network, International Journal of Computer Science Issues, Vol. 7, No. 2, 2010.
[2] Kamalesh V. N and S. K. Srivatsa, On the Assignment of node number in a Computer Communication Network, proceedings of the International conference on Communication System and Technologies WCECS, 2008, pp. 375-378.

Onur Ugurlu received him B.E. degree in Mathematics and Computer Science in 2011. He is currently is the M.E. degree candidate with School of Computer Science, Ege University, Izmir, Turkey. His research interests include artificial intelligence and graph theory.

Murat Ersen Berberler assistant professor received him B.E. degree in Mathematics and Computer Science in 2003 and M.E. degree in Computer Science from Ege University in 2006, received him Ph.D. degree in Computer Science from Ege University in 2009. He is currently with School of Computer Science, Dokuz Eylul University, Izmir, Turkey. He research interests include computer networks, design and analysis of algorithms and mathematical modeling.