Problems Column

Discussiones Mathematicae
Graph Theory 19 (1999) 249

ON STRONGLY CONNECTED ORIENTATIONS OF GRAPHS

Matúš Harminc

Department of Geometry and Algebra
Faculty of Science, P.J. Šafárik University
Jesenná 5, 041 54 Košice, Slovak Republic

e-mail: harminc@duro.upjs.sk

We consider finite, loopless graphs or digraphs, without multiple edges or arcs (with no pairs of opposite arcs). Let $G = (V, E)$ be a graph. A digraph $D = (V, A)$ is an orientation of G if A is created from E by replacing every edge of E by an arc in one direction.

Let n_d denote the number of vertices with the degree d in G. By the degree pair of a vertex $v \in V$ in D the ordered pair $[outdegree(v), indegree(v)]$ is meant.

It is easy to see that if there exists a strongly connected orientation D of a graph G with pairwise different degree pairs of vertices in D then in G we have $n_d < d$ for every positive integer d.

Conjecture. Let G be an undirected graph and let $n_d < d$ for every positive integer d. Then there exists a strongly connected orientation D of G with pairwise different degree pairs of vertices.

Received 2 February 1999
Revised 7 October 1999