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A CONSTRUCTIVE EXTENSION OF THE CHARACTERIZATION ON POTENTIALLY $K_{s,t}$-BIGRAPHIC PAIRS [1]

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Abstract

Let $K_{s,t}$ be the complete bipartite graph with partite sets of size s and t. Let $L_1 = ([a_1, b_1], \ldots, [a_m, b_m])$ and $L_2 = ([c_1, d_1], \ldots, [c_n, d_n])$ be two sequences of intervals consisting of nonnegative integers with $a_1 \geq a_2 \geq \cdots \geq a_m$ and $c_1 \geq c_2 \geq \cdots \geq c_n$. We say that $L = (L_1; L_2)$ is potentially $K_{s,t}$ (resp. $A_{s,t}$)-bigraphic if there is a simple bipartite graph G with partite sets $X = \{x_1, \ldots, x_m\}$ and $Y = \{y_1, \ldots, y_n\}$ such that $a_i \leq d_G(x_i) \leq b_i$ for $1 \leq i \leq m$, $c_i \leq d_G(y_i) \leq d_i$ for $1 \leq i \leq n$ and G contains $K_{s,t}$ as a subgraph (resp. the induced subgraph of $\{x_1, \ldots, x_s, y_1, \ldots, y_t\}$ in G is a $K_{s,t}$). In this paper, we give a characterization of L that is potentially $A_{s,t}$-bigraphic. As a corollary, we also obtain a characterization of L that is potentially $K_{s,t}$-bigraphic if $b_1 \geq b_2 \geq \cdots \geq b_m$ and $d_1 \geq d_2 \geq \cdots \geq d_n$. This is a constructive extension of the characterization on potentially $K_{s,t}$-bigraphic pairs due to Yin and Huang (Discrete Math. **312** (2012) 1241–1243).

Keywords: degree sequence, bigraphic pair, potentially $K_{s,t}$-bigraphic pair.

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