

## A CONSTRUCTIVE EXTENSION OF THE CHARACTERIZATION ON POTENTIALLY $K_{s,t}$ -BIGRAPHIC PAIRS<sup>1</sup>

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### Abstract

Let  $K_{s,t}$  be the complete bipartite graph with partite sets of size  $s$  and  $t$ . Let  $L_1 = ([a_1, b_1], \dots, [a_m, b_m])$  and  $L_2 = ([c_1, d_1], \dots, [c_n, d_n])$  be two sequences of intervals consisting of nonnegative integers with  $a_1 \geq a_2 \geq \dots \geq a_m$  and  $c_1 \geq c_2 \geq \dots \geq c_n$ . 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  $X = \{x_1, \dots, x_m\}$  and  $Y = \{y_1, \dots, y_n\}$  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  $\{x_1, \dots, x_s, y_1, \dots, y_t\}$  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  $b_1 \geq b_2 \geq \dots \geq b_m$  and  $d_1 \geq d_2 \geq \dots \geq d_n$ . 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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