

## Existence and Construction of Maximal Rectangular Duals

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**Abstract :** Given a graph  $G = (V, E)$ , a rectangular dual of  $G$  represents the vertices of  $G$  by a set of interior-disjoint rectangles such that two rectangles touch if and only if there is an edge between the two corresponding vertices in  $G$ . Rectangular duals do not exist for every graph, so we can define maximal rectangular duals. A maximal rectangular dual is a rectangular dual of a graph  $G$  such that there exists no graph  $G'$  with a rectangular dual where  $G$  is a subgraph of  $G'$ . In this paper, we enumerate all maximal rectangular duals (or, to be precise, the corresponding planar graphs) up to six nodes and presents a necessary condition for the existence of a rectangular dual. This work allegedly has applications in integrated circuit design and architectural floor plans.

**Keywords :** adjacency, degree sequence, dual graph, rectangular dual

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