Enumerating Maximal Rectangular Floor Plans on ‘N’ Vertices

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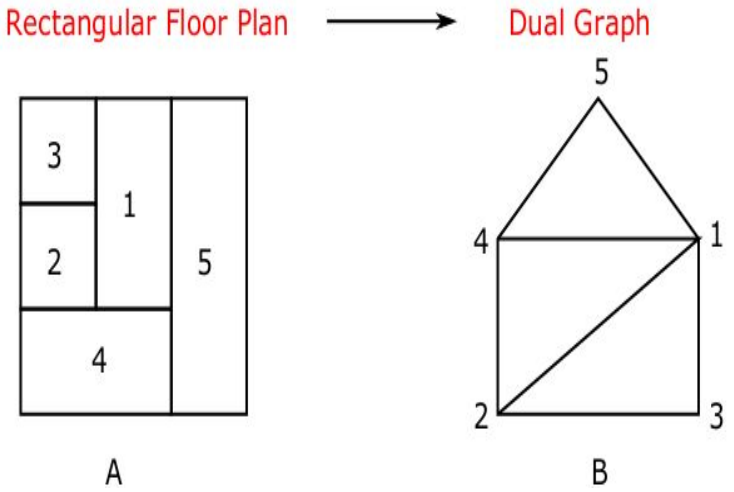
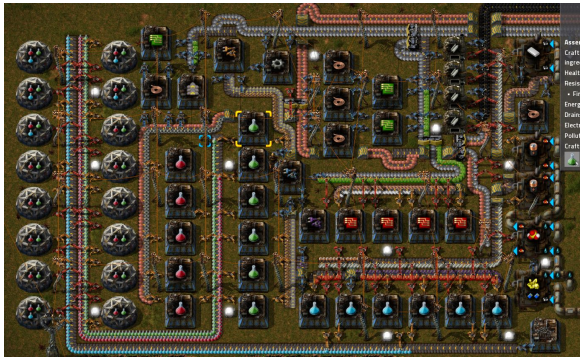
What is Rectangular Floor Plan(RFP) ??

A Rectangular Graph is a graph where all regions are four-sided and all edges are oriented in either the vertical or horizontal direction. In addition the graph enclosure must also be rectangular.



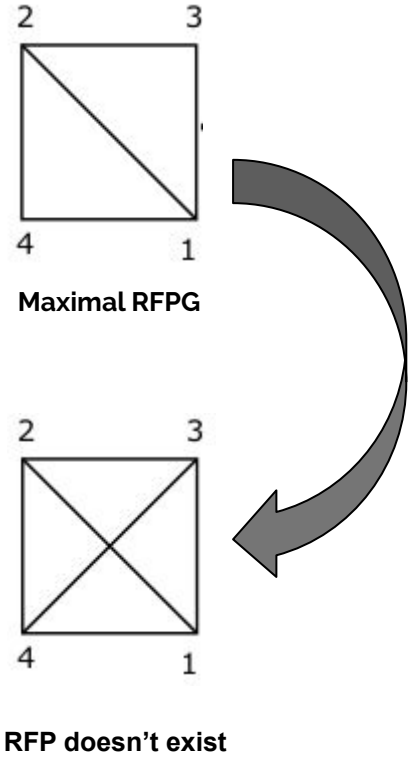
Application of Rectangular Floor Plan

- architectural design
- compacting of electronic circuits



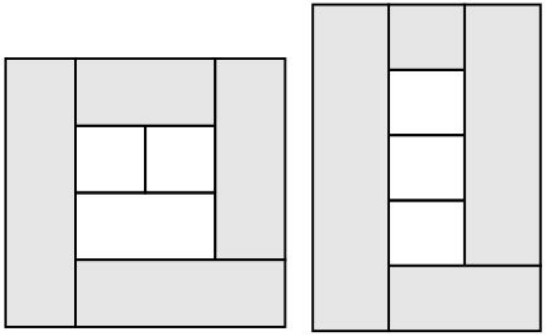
FINDING IF THE RFP EXIST!

Given a planar graph on ‘n’ vertices, if the graph is not subgraph of Maximal rectangular floor plan graph, RFP representation of that graph doesn’t exist. So, Maximal RFP are of much use.



PROBLEM STATEMENT

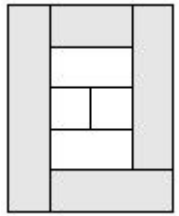
Given number of vertices(n), the problem is to enumerate all Maximal rectangular floor plan having ‘n’ rooms.



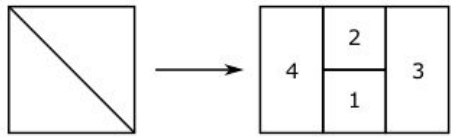
Maximal RFP on 7 vertices

KEY IDEA & PREVIOUS WORK

RFP(n) is best connected(Maximal) if and only if it has only four rooms on the boundary.
Now, the problem gets reduced on finding Rectangular floor plan(RFP) on ‘n-4’ vertices & we call the dual graph corresponding to it as INNER GRAPH.

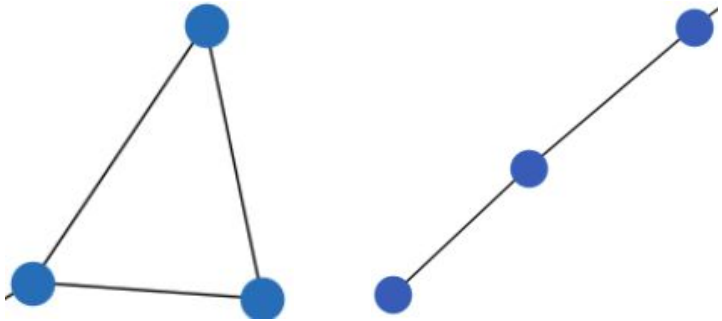


Maximal RFP on 8 vertices

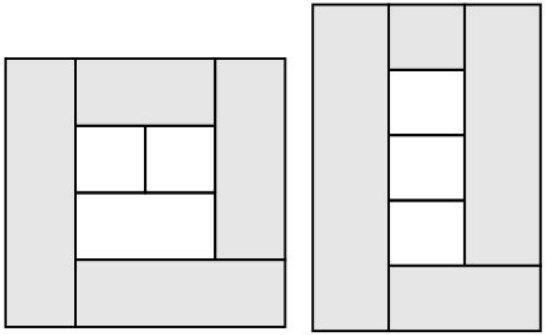


Inner graph **RFP on 4 vertices**

INNER GRAPH & CORRESPONDING RFP



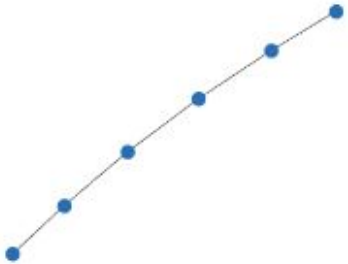
Inner graph on ‘n-4’ (3) vertices



Maximal RFP on 7 vertices

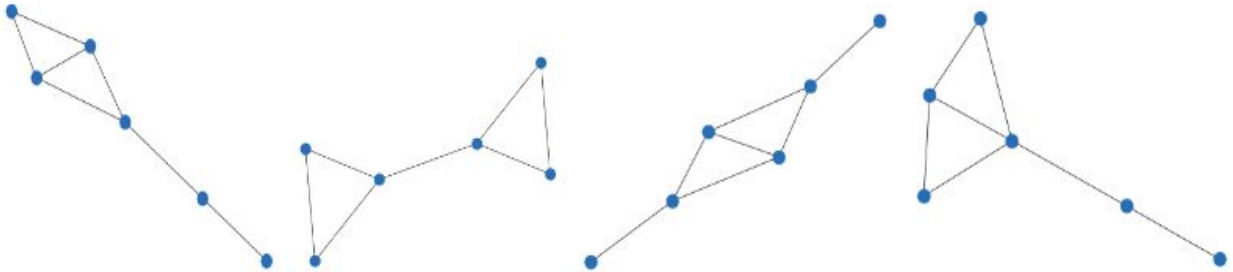
ENUMERATION OF ALL INNER GRAPH

Number of edges = 5



Number of edges = 6

Number of edges = 7



THANK YOU