

UNIVERSITY OF LJUBLJANA
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Financial mathematics – 1st cycle

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Rich-Neighbor Edge Colorings

Term Paper in Finance Lab
Short Presentation

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Ljubljana, 2023

1. INTRODUCTION

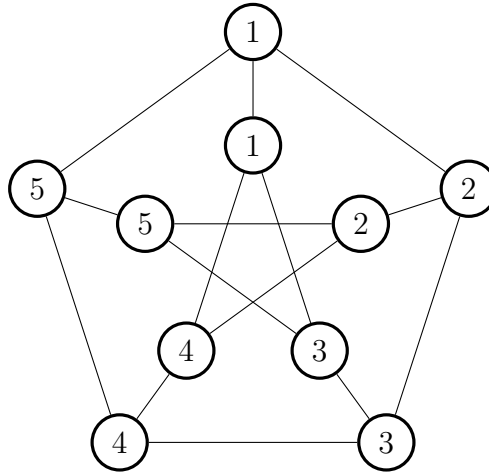
In this paper we set out to analyse an open conjecture in a modern graph theory problem known as rich-neighbour edge coloring.

Definition 1.1. In an edge coloring, an edge e is called *rich* if all edges adjacent to e have different colors. An edge coloring is called a *rich-neighbor edge coloring* if every edge is adjacent to some rich edge.

Definition 1.2. $X'_{rn}(G)$ denotes the smallest number of colors for which there exists a rich-neighbor edge coloring.

Conjecture 1.3. For every graph G of maximum degree Δ , $X'_{rn}(G) \leq 2\Delta - 1$ holds.

Example 1.4. Let's take a look at the Petersen graph and an example of a rich-neighbor edge coloring.



We can see that for the Petersen graph (which is 3-regular) $X'_{rn} = 5 \leq 5$. ◇