



Locating and neighbor-locating colorings of graphs

Supraja D K

PhD scholar, IIT Dharwad

Supervisor: Dr. Sagnik Sen

Locating coloring

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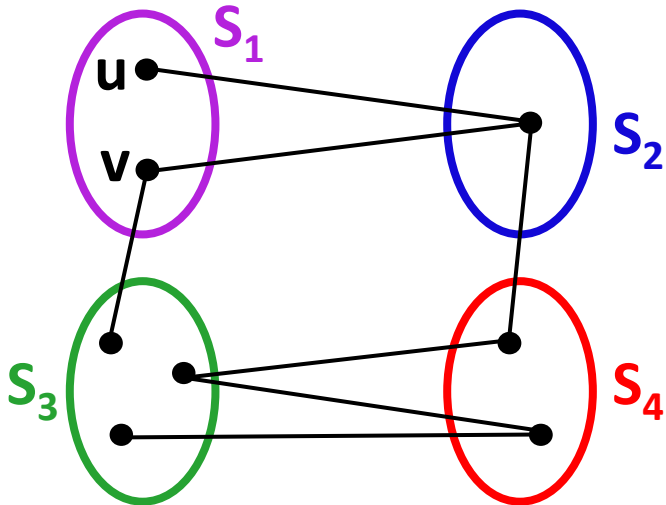
- proper coloring

Locating coloring

- proper coloring
- $u, v \in S_i$ then $d(u, S_j) \neq d(v, S_j)$ for some S_j .

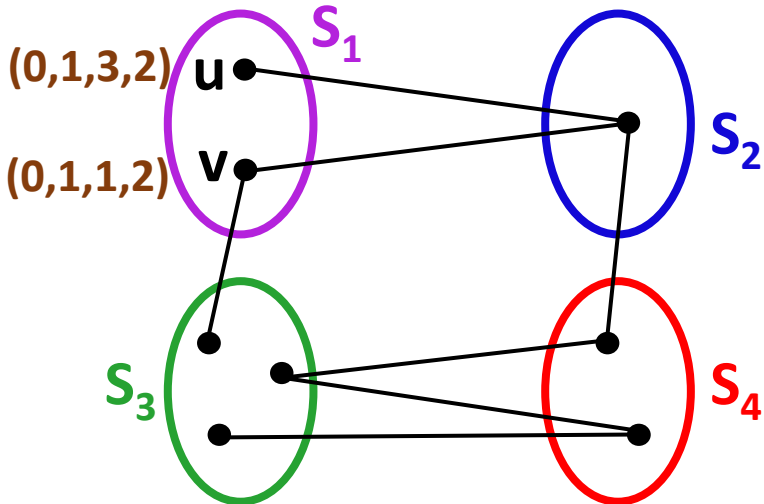
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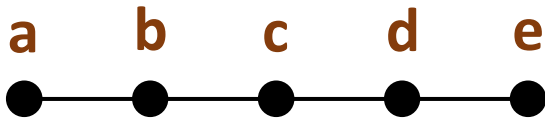


Locating coloring

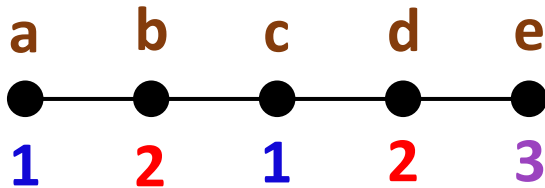
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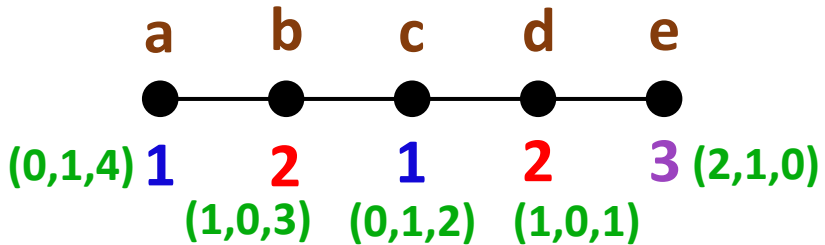
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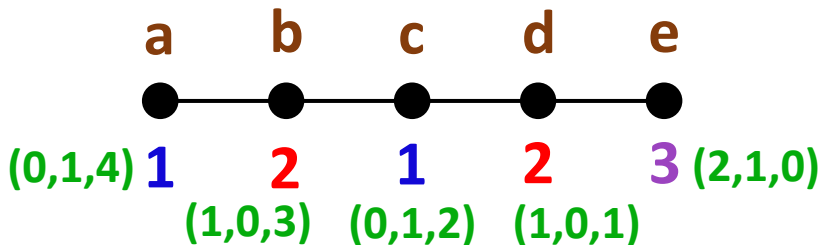
Locating coloring



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$$\chi_L(G)=3$$

Neighbor-locating coloring

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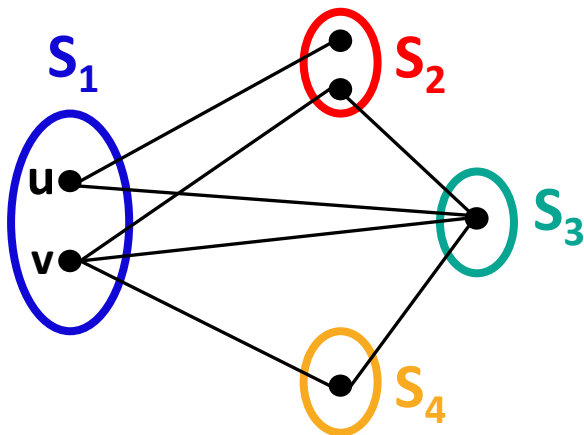
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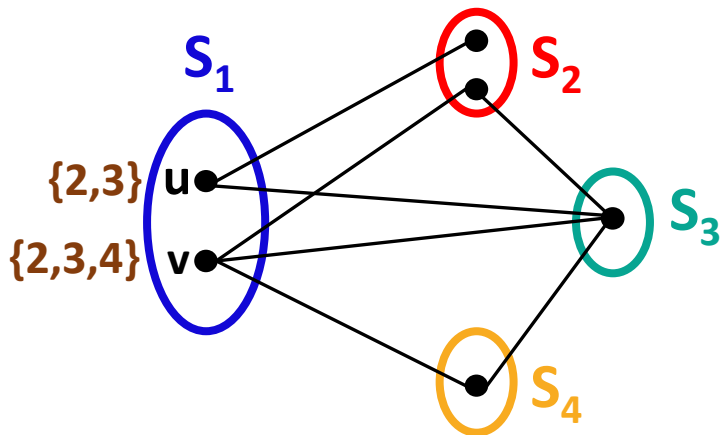
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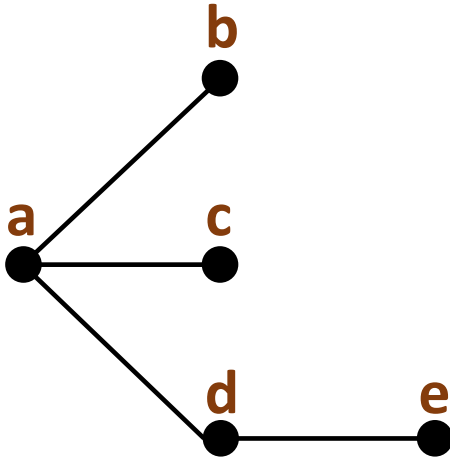


Neighbor-locating coloring

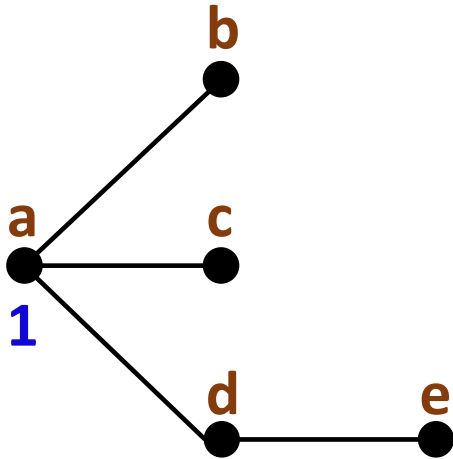
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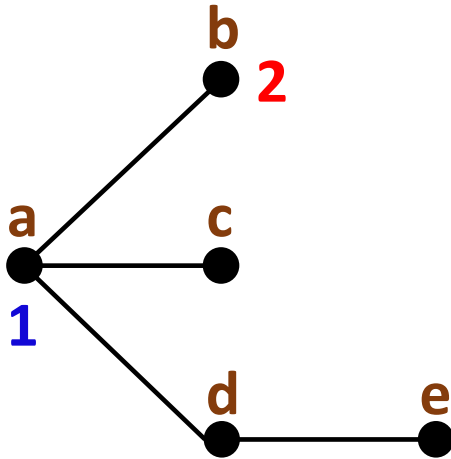
Neighbor-locating coloring



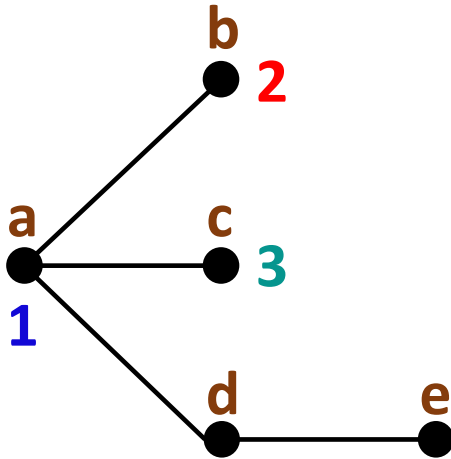
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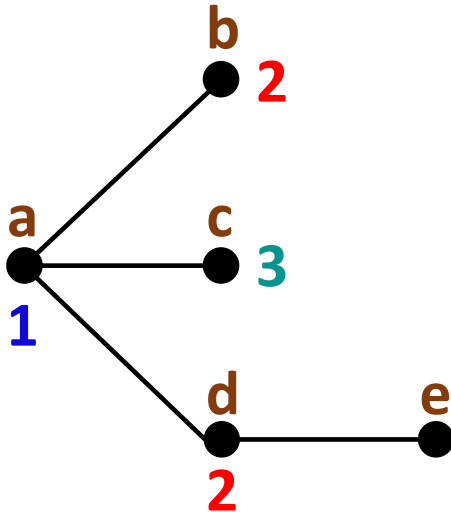
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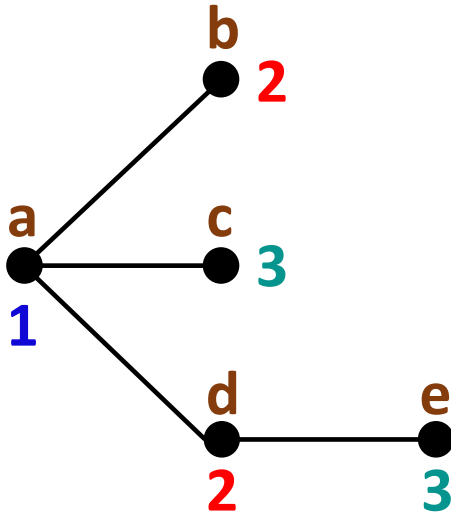
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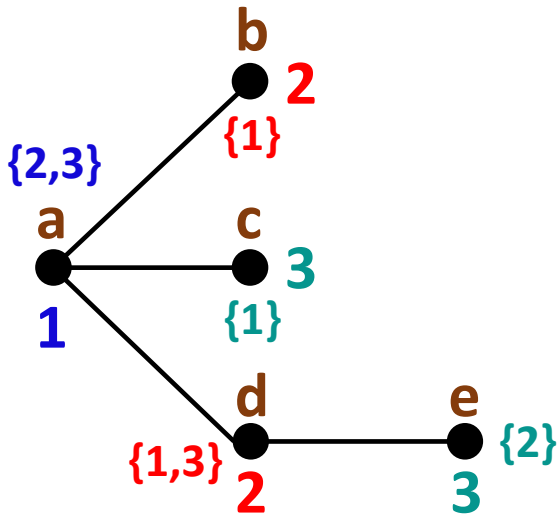
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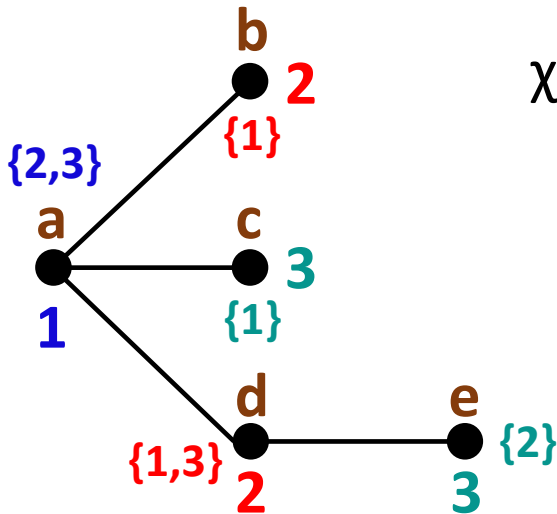


Neighbor-locating coloring



Neighbor-locating coloring

$$\chi_{NL}(G)=3$$



Open problems

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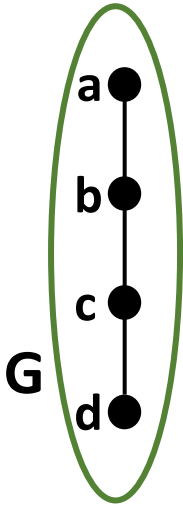
- For what G , $\chi_{NL}(G) = \chi_L(G)$?

Open problems

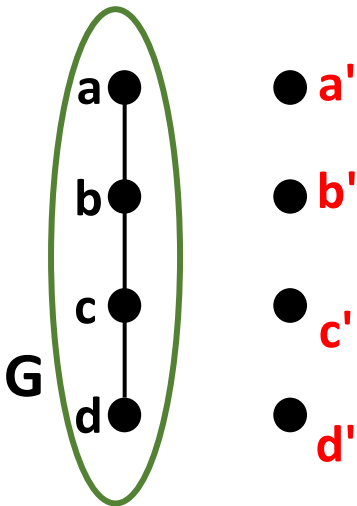
- For what G , $\chi_{NL}(G)=\chi_L(G)$?
- For what G , $\chi_{NL}(G)=\chi(G)$?

Mycielski graph $\mu(G)$

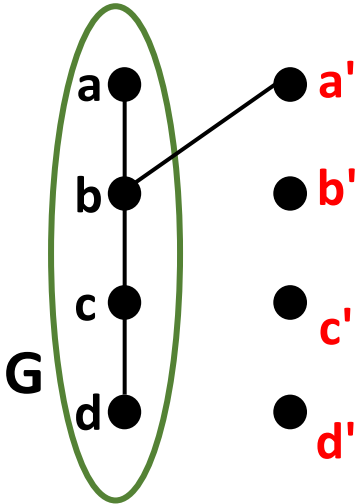
Mycielski graph $\mu(G)$



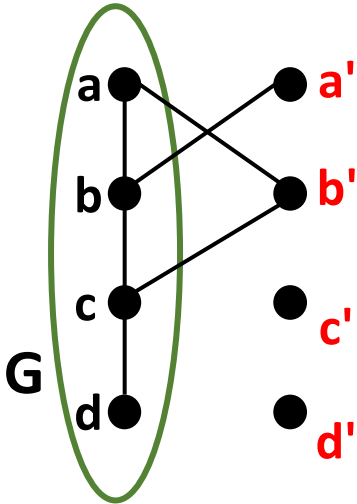
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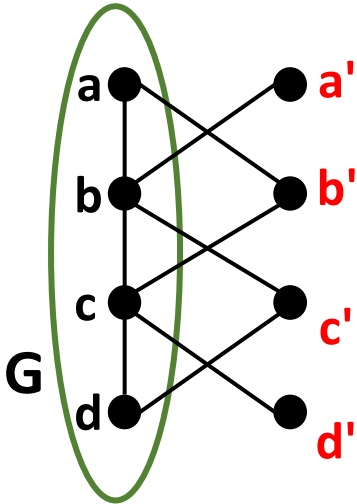
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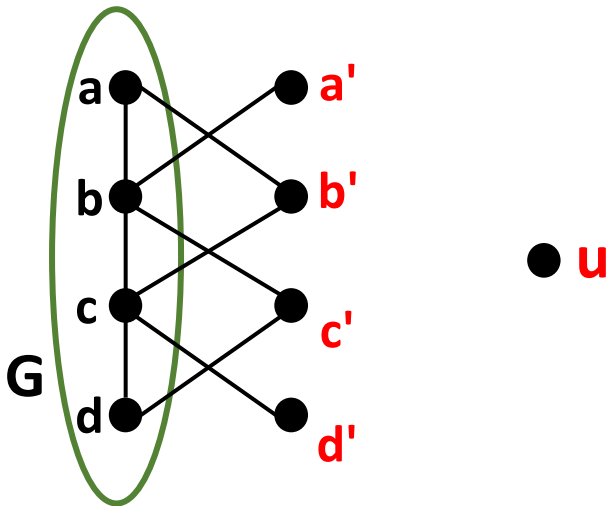
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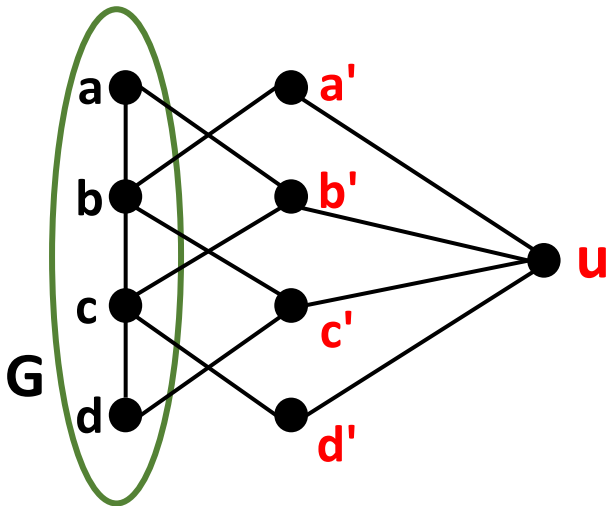
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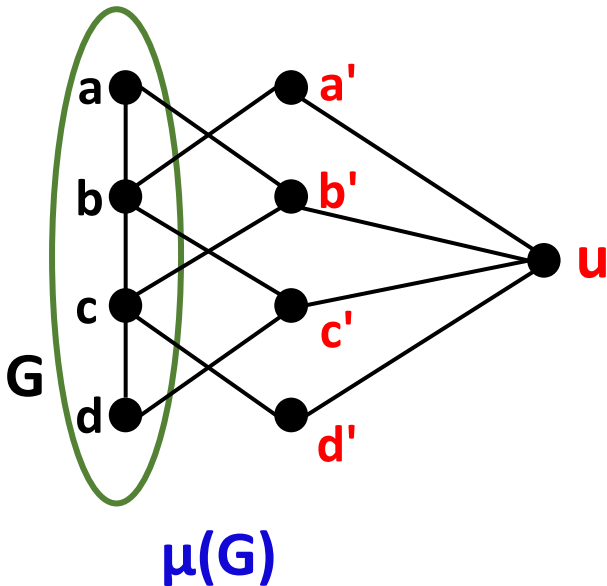
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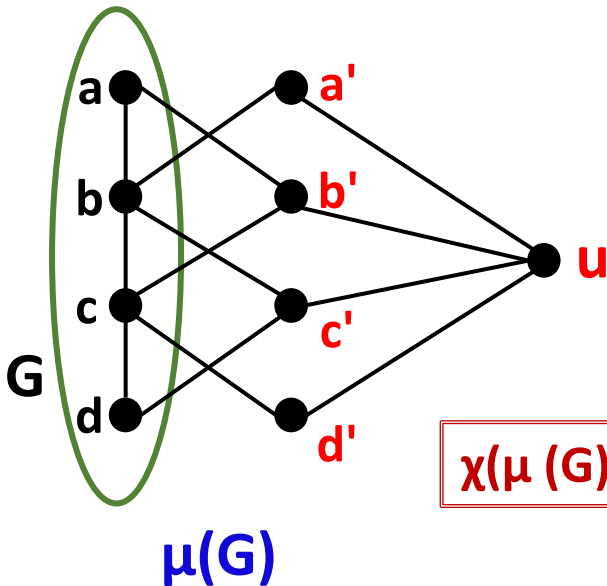
Mycielski graph $\mu(G)$



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Mycielski graph $\mu(G)$



$$\chi(\mu(G)) = \chi(G) + 1$$

Open problems

- For what G , $\chi_{NL}(G)=\chi_L(G)$?
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- Is $\chi_{NL}(\mu(G))=\chi_{NL}(G)+1$? **[Alcon et al., 2020]**

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(proved for paths, cycles, complete multipartite graphs)

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(proved for paths, cycles, complete multipartite graphs)
- Fixed parameter tractability of the decision problem.



THANK YOU!

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