

Rainbow cycles

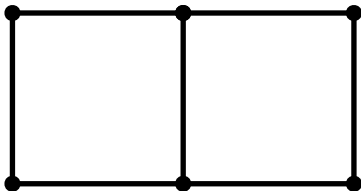
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Mentor: Sophie Spirkl

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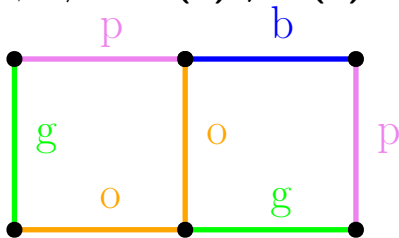
Rainbow cycle

- Graph $G(V, E)$
 - ▶ n vertices, m edges
- Colors $\{1, \dots, n\}$
- Rainbow cycle R
 - ▶ each e has color $c(e)$ in $\{1, \dots, n\}$
 - ▶ $\forall e, f \in R, e \neq f : c(e) \neq c(f)$



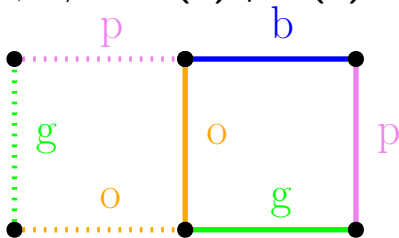
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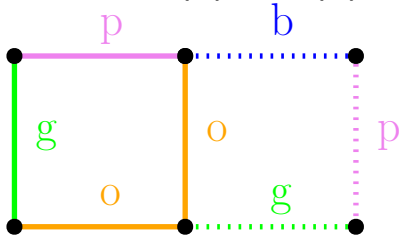
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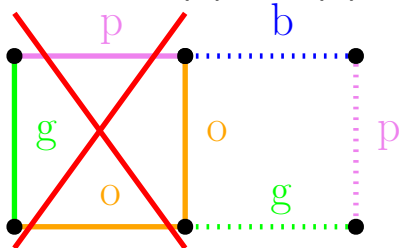
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Main problem

- Graph on n vertices
- Sets of colors $\{E_1, E_2, \dots, E_n\}$
- For each color $i : |E_i| \geq k$

Question

*Exists in G a rainbow cycle
of length at most $\lceil \frac{n}{k} \rceil$?*

Example

- n ... num. of vertices

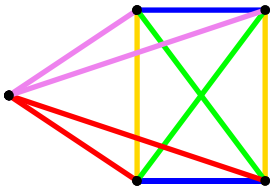
$$n = 5$$

- k ... num. of edges assigned to every color

$$k = 2$$

- rainbow cycle of length at most

$$\left\lceil \frac{n}{k} \right\rceil = \left\lceil \frac{5}{2} \right\rceil = 3$$



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- n ... num. of vertices

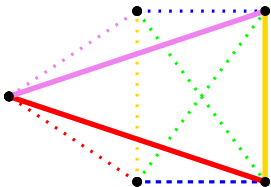
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Thank you

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and all organizers of the REU programme.
Thank you for your attention!