

6	9	13	7
12		10	5
3	1	4	14
15	8	11	2

Mathematics for Computer Science
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Tree coloring

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tree-color.1

6	9	13	7
12		10	5
3	1	4	14
15	8	11	2

unique paths

A tree is a graph with **unique paths** between every pair of vertices.

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tree-color.2

6	9	13	7
12		10	5
3	1	4	14
15	8	11	2

Chromatic Number

chromatic number, $\chi(G)$

lemma:

$$\chi(\text{tree}) = 2$$

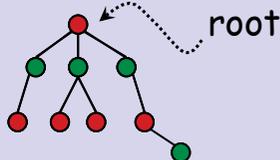
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tree-color.3

6	9	13	7
12		10	5
3	1	4	14
15	8	11	2

Trees are 2-colorable



Pick any vertex as "root."
if (unique) path from root is
even length: ●
odd length: ●

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tree-color.4

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