The ASP solving process
via Graph coloring

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`http://potassco.sourceforge.net/videos.html`

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Contents

1 Process

okular –presentation asp-solving.pdf

2 Problem

- `http://en.wikipedia.org/wiki/Graph_coloring`

- Example: Graph coloring, Section 3.1 in [1]

- Given a graph consisting of nodes and edges, assign each node one color such that no two nodes connected by an edge have the same color

3 Modeling

3.1 Problem instance

A **graph** consisting of nodes and edges, along with some colors, is represented as

- facts formed by predicates node/1 and edge/2

- facts formed by predicate col/1

3.1.1 Commands

view-file graph.lp

3.2 Problem class

Assign each node one color such that no two nodes connected by an edge have the same color

In other words:

- Each node has a unique color

- Two connected nodes must not have the same color

3.2.1 Commands

view-file color.lp4 [2]

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[1]M. Gebser, R. Kaminski, B. Kaufmann, and T. Schaub. Answer Set Solving in Practice. Synthesis Lectures on Artificial Intelligence and Machine Learning, Morgan and Claypool December 2012, 238 pages, `10.2200/S00457ED1V01Y201211AIM019`

[2]We use extension lp4 to indicate encodings for gringo 4 (along the ASP-Core-2 standard [3])

[3]F. Calimeri, W. Faber, M. Gebser, G. Ianni, R. Kaminski, T. Krennwallner, N. Leone, F. Ricca, and T. Schaub: ASP-Core-2: Input language format. 2012. Available at `https://www.mat.unical.it/aspcomp2013/files/ASP-CORE-2.0.pdf`.

okular –presentation methodology.pdf

4 Grounding

gringo4 –version

- <u>human-readable output</u> gringo4 color.lp4 graph.lp –text

- <u>machine-readable output</u> (see Table 7.1 in [1]) gringo4 color.lp4 graph.lp

4.1 NB: You may as well want to try gringo 3 for more options:

view-file color.lp4 [2] view-file color.lp
    gringo3 color.lp graph.lp –text
    gringo3 color.lp4 graph.lp –text gringo4 color.lp4 graph.lp –text

5 Solving

clasp3 –version
    gringo4 color.lp4 graph.lp | clasp3 gringo4 color.lp4 graph.lp | clasp3 0
    gringo4 color.lp4 graph.lp | clasp3 0 –stats

6 Miscellaneous

6.1 Alternative encoding

view-file colorD.lp4 [2]
    gringo4 colorD.lp4 graph.lp –text gringo4 colorD.lp4 graph.lp | clasp3 0

6.2 clingo versus gringo+clasp

clingo4 –version
    clingo4 color.lp4 graph.lp
    clingo4 –help

- "–help=3" clingo4 –help=3

- "–mode" clingo4 –mode=gringo color.lp4 graph.lp | clingo4 –mode=clasp