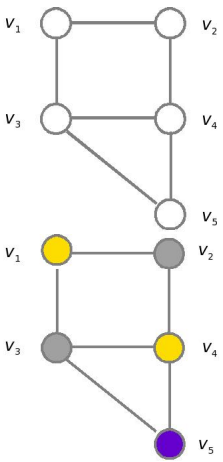
Constraint model for graph coloring

Given $k = 3$ colors, does there exist a coloring of the nodes such that adjacent nodes are assigned different colors?

Variables: v_1, v_2, v_3, v_4, v_5

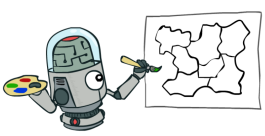
Domains: $\{yellow, grey, blue\}$

Constraints: $v_i \neq v_j$ if v_i and v_j are adjacent



Example (Colouring Dracula's land in red)

Can the following map of Romania be coloured with only 3 colours? What about 4 colours? Find a solution in which Transylvania, the birth place of Dracula, is coloured red. How many solutions exist?



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set(arithmetic).
assign(max_models,-1).
assign(domain_size,9). % 9 regions

formulas(remove_isomorphic).
  Red=0. Yellow=1. Blue=2. Green=3.

  T < Maramures.          Maramures < Bucovina.      Bucovina < Moldova.
  Moldova < Dobrogea.     Dobrogea < Muntenia.       Muntenia < Oltenia.
  Oltenia < Banat.        Banat < Crisana.
end_of_list.

formulas(assumptions).
  n(x,y) -> color(x) != color(y).  % neighbors have different colors
  n(x,y) <-> n(y,x).

  n(T,Crisana).            n(T,Maramures).          n(T,Bucovina).
  n(T,Moldova).            n(T,Muntenia).           n(T,Oltenia).
  n(T,Banat).              n(Crisana,Maramures).    n(Crisana,Banat).
  n(Oltenia,Banat).        n(Oltenia,Muntenia).     n(Maramures,Bucovina).
  n(Bucovina,Moldova).     n(Moldova,Dobrogea).     n(Moldova,Muntenia).
  n(Dobrogea,Muntenia).

 -n(T,Dobrogea).          -n(Maramures,Banat).     -n(Maramures,Oltenia).
 -n(Maramures,Muntenia). -n(Maramures,Moldova).   -n(Maramures,Dobrogea).
 -n(Bucovina,Crisana).    -n(Bucovina,Banat).      -n(Bucovina,Oltenia).
 -n(Bucovina,Muntenia).   -n(Bucovina,Dobrogea).   -n(Moldova,Oltenia).
 -n(Moldova,Banat).       -n(Moldova,Crisana).     -n(Dobrogea,Crisana).
 -n(Dobrogea,Banat).      -n(Dobrogea,Oltenia).    -n(Muntenia,Banat).
 -n(Muntenia,Crisana).    -n(Oltenia,Crisana).

  color(T) = Red.                  %Dracula's birth place should be red
end_of_list.
```