

Problem Solving and Search in AI

Tutorial 3 (on May 23rd)

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Exercise 3.1:

Given the program P_i , determine the stable models of P_i by applying the *Gelfond-Lifschitz-Reduct*.

$$\begin{array}{lll} P_1 = \{a \leftarrow \text{not } b, c; & P_2 = \{a \leftarrow \text{not } b; & P_3 = \{a \leftarrow a; \\ & b \leftarrow \text{not } c; & b \leftarrow c, d; \\ & c \leftarrow \text{not } b\} & c \leftarrow \text{not } d; \\ & & d \leftarrow \text{not } c, a\} \end{array}$$

Exercise 3.2:

Model and solve the following problem with ASP.

The Smith family and their three children want to pay a visit but they do not all have the time to do so. Following are few hints who will go and who will not:

- If Mr Smith comes, his wife will come too.
- At least one of their two sons Matt and John will come.
- Either Mrs Smith or Tim will come, but not both.
- Either Tim and John will come, or neither will come.
- If Matt comes, then John and his father will also come.

Implement and test the encodings using one of the ASP solvers, for example clingo (<http://potassco.sourceforge.net/index.html>) or dlv (<http://www.dlvsystem.com>).

An online tool for ASP including examples and tutorial notes is available at <http://potassco.sourceforge.net/clingo.html>.

Further tutorials on ASP:

<https://sourceforge.net/projects/potassco/files/guide/>,
http://www.dlvsystem.com/html/DLV_User_Manual.html and
http://www.dlvsystem.com/html/The_DLV_Tutorial.html.