Problem Solving and Search in AI
Tutorial 3 (on June 2nd)

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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.*

$$P_1 = \{a \leftarrow not\ b, c;$$
$$b \leftarrow not\ a;$$
$$c \leftarrow not\ b\}$$

$$P_2 = \{a \leftarrow not\ b;$$
$$b \leftarrow not\ c;$$
$$c \leftarrow not\ a\}$$

$$P_3 = \{a \leftarrow a;$$
$$b \leftarrow c, d;$$
$$c \leftarrow not\ d;$$
$$d \leftarrow not\ c, a\}$$

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://asptut.gibbi.com`.
Further tutorials on ASP:
`http://www.dlvsystem.com/html/DLV_User_Manual.html` and
`http://www.dlvsystem.com/html/The_DLV_Tutorial.html`.