Exercise 3.1:
Given the program $P_i$, determine the stable models of $P_i$ by applying the Gelfond-Lifschitz-Reduct.

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

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

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

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: