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

\[
\begin{align*}
P_1 = & \{ a \leftarrow \text{not } b, c; \\
& \quad b \leftarrow \text{not } a; \\
& \quad c \leftarrow \text{not } b \} \\
\end{align*}
\]

\[
\begin{align*}
P_2 = & \{ a \leftarrow \text{not } b; \\
& \quad b \leftarrow \text{not } c; \\
& \quad c \leftarrow \text{not } a \} \\
\end{align*}
\]

\[
\begin{align*}
P_3 = & \{ a \leftarrow a; \\
& \quad b \leftarrow c, d; \\
& \quad c \leftarrow \text{not } d; \\
& \quad d \leftarrow \text{not } c, a \} \\
\end{align*}
\]

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/,