The ML data type \texttt{BOOL}, defined below, is to be used to represent boolean expressions.

\begin{verbatim}
datatype BOOL = VAR of string  
  | NOT of BOOL  
  | AND of BOOL*BOOL  
  | OR of BOOL*BOOL;
\end{verbatim}

The constructor \texttt{VAR} is used to represent named boolean variables, and \texttt{NOT}, \texttt{AND} and \texttt{OR} are used to represent the corresponding boolean operators.

Define a function that will return a list of the distinct names used in a given boolean expression. \hspace{1cm} [4 marks]

A context is represented by a list of strings corresponding to the boolean variables that are set to true. All other variables are deemed to be set to false. Define a function that will evaluate a given boolean expression in a given context. \hspace{1cm} [3 marks]

Incorporate your two functions into a program that will determine whether a given boolean expression is true for all possible settings of its variables. \hspace{1cm} [3 marks]