

COMP 410  
Summer 2025

Grammar-based Test Generation

Consider the following grammar, corresponding to a simplistic programming language:

$$e \in \textit{Expression} ::= \textbf{true} \mid \textbf{false} \mid \textbf{if}(e_1, e_2, e_3)$$

Using Prolog, write a procedure which takes a maximum expression depth, and will produce valid sentences according to the above grammar. An example query is below:

```
?- exp(0, E).  
E = true ;  
E = false .
```