

CSC 501 - Assignment #6

version 2.0

Due Monday 12/12/16 in Sakai

Problems

1. Given the language definition with function calls 'sem-func.pl' (available on the website), write a program that exhibits the fact that functions exhibit variable shadowing (the phenomenon that local variables can hide global variables of the same name).
2. Given the following pre- and postconditions,

$$\begin{aligned}\text{pre}(P) &\equiv \text{lookup}(n, P, 3) \\ \text{post}(Q) &\equiv \text{lookup}(n, Q, 3! - 1)\end{aligned}$$

- (a) Write a program in the language defined by 'sem.pl' (or any of the semantic definitions we have covered) and prove that it satisfies this specification.
 - (b) Write another program, different from the first program, and show that it also satisfies the specification.
3. Given the source and the target languages discussed in class for the translational semantics (available on the website),
 - (a) Extend the source language with the 'dowhile' command (as you did for Assignment #5), show that it works with some examples.
 - (b) Extend the 'translate' predicate so that it translates the 'dowhile' command into the appropriate target language structures. Show that your translation works by demonstrating that examples written in the source language and their translated equivalents compute the same values.
 4. (Extra Credit) Prove that your translation for the 'dowhile' loop is correct.

All work has to be done in Prolog. Please hand in your specifications, proof scores, and run logs for this homework.