CSCI 5535: Homework Assignment 6

Due Thursday, March 11, 2010

Meta-comment: This homework is shorter than previous homeworks so that you have more time to ramp up on your course project.

Exercise 1: Indicate in a sentence or two how much time you spent on this homework, how difficult you found it subjectively, and what you found to be the hardest part. Tell me something about yourself that I do not already know. Any non-empty answer will receive full credit.

Also, if your opinions have changed since the last assignment, indicate one thing you like about the class so far and one thing you would change about it.

Exercise 2: Prove using Hoare rules the following property:

For any BExp \( b \), if we start the command

\[
\text{while } b \text{ do } x := x + 2
\]

in a state in which \( x \) is even, and if the command terminates, it terminates in a state in which \( x \) is even.

Hint: your proof should not use induction.

Exercise 3: Prove that for any command \( c \) and any assertion \( A \), we can construct a derivation for

\[
\vdash \{A\} \ c \ \{\text{true}\}
\]

You may assume that for any assertion \( A \), we can construct a derivation for \( \vdash A \Rightarrow \text{true} \).

Do not prove this statement by using weakest preconditions or by invoking the completeness of the Hoare rules, which are concepts we will discuss next week.

Exercise 4: Give a Hoare rule for \( \text{do } c \text{ while } b \). This statement has the standard semantics (e.g., \( c \) is executed once before \( b \) is tested).