Technische Universität München
Fakultät für Informatik
Dr. Peter Lammich
Simon Wimmer

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Semantics of Programming Languages

Exercise Sheet 11

Exercise 11.1 Do Until

Your task is to add a construct *DO c UNTIL b* to IMP. It should have the following semantics:

1. Execute *c*
2. If *b* holds then stop, else go to 1.

You should follow these steps:

- Make a copy of the *IMP* folder in the repository
- Syntax: add the *until* command to *Com.thy*
- Semantics: add rules for the new construct to the definition of the big step semantics in *Big_Step.thy*, and prove an unfold rule for *until* similar to the one for *while*.
- Weakest preconditions: prove rules *wlp_untilI'* and *wp_untilI'* analogously to *wlp_whileI'* and *wp_whileI'* in *Wp.thy*
- Prove completeness of the weakest precondition rules for *until*. Copy the proofs from the lecture for *while*, adopt the definition of *count_it*, and complete the proofs for *until*.

Exercise 11.2 Compiler for "Do Until"

Add the *until* construct to the compiler in *Compiler.thy*, and complete the proofs.

Homework 11.1 Be Original!

Submission until Tuesday, January 15, 2019, 10:00am. (20 regular points, plus bonus points for nice submissions)
We extend the deadline for the "Be Original" homework by one week. Use the extra time to complete and polish your projects.