# Homework 2 of CS520 Theory of Programming Languages

Submit your solutions to the TAs by putting them in the homework submission box in the third floor of the E3-1 building by 2:00pm on 30 October 2019 (Wednesday). If you type up your solutions, you can submit them via KLMS.

The numbers in the questions refer to exercise questions in the textbook of the course, i.e. "Theories of Programming Languages" by John C. Reynolds.

## Question 1

Solve 3.1.

## Question 2

Solve the partial correctness variant of the question 3.4. That is, replace the total correctness specification in the question 3.4 by the following partial correctness specification:

$$\Big\{x \geq 0 \wedge x = x_0 \wedge y = y_0\Big\}\ \textbf{while}\ x \neq 0\ \textbf{do}\ (x := x - 1; y := y + x)\ \Big\{y = y_0 + x_0 \times (x_0 - 1)/2\Big\}$$

Then, derive this partial correctness specification using the rules of Hoare logic that you learnt in the lectures.

## Question 3

Solve 3.8.