

Homework 1 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 4 October 2019 (Friday). 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 1.5(a), 1.5(b) and 1.5(c).

Question 2

Solve 1.7(a) and 1.7(b) only for the case that p there is an integer expression. You may assume the following slightly simpler grammar for integer expressions in your answer.

$$\langle \text{intexp} \rangle ::= 0 \mid 1 \mid \dots \mid \langle \text{var} \rangle \mid -\langle \text{intexp} \rangle \mid \langle \text{intexp} \rangle + \langle \text{intexp} \rangle \mid \langle \text{intexp} \rangle * \langle \text{intexp} \rangle$$

Hint: Use the structural induction that we discussed in the lectures.

Question 3

Solve 2.2(a), 2.2(b) and 2.2(c).

Question 4

Solve 2.4.

Question 5

Solve 2.9.