Presentation topics on Semantics of Programming Languages

Each topic assumes a detailed presentation with approximate length half an hour. All references are from the Nielsons’ book. You may use either the setting of the book or that of the lectures.

1. The abstract syntax of While. Free variables; Lemma 1.12, Exercise 1.13. Substitution; Exercises 1.14, 1.15.

2. Natural semantics of While. Semantic equivalence; Lemma 2.5. Semantic function; Exercise 2.13.

3. Natural semantics of While. Determinism; Theorem 2.9.


5. Structural semantics of While. Determinism; Exercise 2.22. Semantic function; Exercise 2.25.

6. Theorem 2.26; Lemma 2.27, Lemma 2.28.

7. Partially ordered set, the least element, upper bound, the least upper bound, chain, complete partially ordered set, complete lattice; Fact 5.9, Exercise 5.14, Exercise 5.16, Fact 5.24. Partial order on states; Lemma 5.13, Exercise 5.8, Lemma 5.25.

8. Monotone and continuous functions; Fact 5.29, Lemma 5.30, Exercise 5.34, Lemma 5.35, Theorem 5.37, Exercise 5.40.


