GEBZE TEKNİK ÜNİVERSİTESİ

CSE341 - Programming Languages

Hw2 Solution

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Solve the questions from the book (11th edition) listed below in your own (English) words. There is no page restriction. Upload your answers to Moodle in PDF format. It does not matter if it is hand-writing or typing.

1) Chapter 3: Review questions 14

Why can machine languages not be used to define statements in operational semantics?

Solution:

Machine languages can not be used to define statements in operational semantics. The reasons of this, singular steps in machine execution and the resulting changes in the language and condition of the machine are very small and numerous. In addition, the real computer storages have a large and complex structure.

2) Chapter 3: Problem set 19

Write an attribute grammar whose BNF basis is that of Example 3.6 in Section 3.4.5 but whose language rules are as follows: Data types cannot be mixed in expressions, but assignment statements need not have the same types on both sides of the assignment operator.

Solution:

Replace the second semantic rule with:

* <var>[2].env <- <expr>.env
* <var>[3].env <- <expr>.env
* <expr>.actual_type <- <var>[2].actual_type
* predicate: <var>[2].actual_type == <var>[3].actual_type

3) Chapter 4: Review question 1

What are the reasons why using BNF is advantageous over using an informal syntax description?

Solution:

Using BNF, has some advantages. BNF descriptions are very clear and simple. Another reason, this descriptions can be used as the direct basis for the syntax analyzer. İmplementations based on BNF are relatively easy to maintain because of their modularity.

4) Chapter 4: Review question 5

Describe briefly the three approaches to building a lexical analyzer.

Solution:

There are three approaches to building a lexical analyzer: using a software tool to generate a table for a table-driven analyzer, building such a table by hand, and writing code to implement a state diagram description of the tokens of the language being implemented.