HCMC University of Technology
Faculty of Computer Science & Engineering

Assignment 2

AST Generator

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Contents

Assignment 2

version 1.0

After completing this assignment, you will be able to

- explain the stucture of parser generated by ANTLR
- manipulate (traverse, create) on tree, which has different types of node, using Visitor
- write a short program in Scala to generate intermediate code (AST) for a valid MC program

1 Specification

A parser will check if the input is grammatically correct or not. If the input is grammatically wrong, an error message is released. This is what you did in the phase 2 of assignment 1. In the case the input is grammatically correct, an intermediate code is generated. This is the requirement of this assignment. As AST is selected to be the intermediate code, you are required to write an AST generator for a program written in MC. To complete this assignment, you need to watch the lecture of AST to:

- investigate the structure of a parser generated by ANTLR
- try to find out how to generate an AST from a parse tree.
- investigate the AST classes defined in Scala.
- modify ASTGeneration.scala to generate an AST.
- check your code to make sure it right.

To complete this assignment, you need to:

- download initial code (upload.zip) and unzip it.
- make folder src/main/mc/utils in the code of assignment 1 and copy 3 files AST.scala, Visitor.scala and BaseVisitor.scala into this folder. In these three files, just only AST.scala is used in this assignment while the other two files will be used in the next one. AST.scala defines all classes in AST which is the output of this assignment. You are NOT allowed to modify all these files.

- make folder src/main/mc/astgen/ in the code of assignment 1 and copy ASTGeneration.scala into this folder and modify this file to generate AST from a parse tree, i.e. the result of assignment 1, generated from ANTLR.
- copy AstSuite.scala and TestAst.scala into folder src/test/scala/. You are required to modify AstSuite.scala to create 100 tests in total for this assignment.

2 Submission

This assignment requires you submit your code in 3 files: MC.g4, ASTGeneration.scala and AstSuite.scala. MC.g4 is often modified to complete this assignment but even when it is not modified, it must also be submitted.

All the testcases for this assignment are correctly grammatically correct.

The deadline of this assignment is **16:30 October 6th, 2017**. You are required to submit just only 3 files MC.g4, ASTGeneration.scala and AstSuite.scala, which must have 100 different tests. Note that you must NOT compress your files when submit them.

The website www.cse.hcmut.edu.vn/onlinejudge will be opened some days before the deadline for your submission.

You must complete the assignment by yourself and do not let your work seen by someone else, otherwise, you will be punished by the university rule for plagiarism.

3 Change Log