CS502: Compiler Design

Fall 2021

Assignments A4 and A5: "Honey, Are You Alive?" and "Honey the Pooh"

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1   Assignment Objective

Use JavaCC and JTB to (i) write an IDFA that performs live-variable analysis (A4); (ii) eliminate dead code (single pass; A5).

2   Problem Statement

After simplifying the honey in the previous assignment, Pooh decides to go through it one more time to check for any lively bee that might have gotten mixed in. He needs you to separate the bees so that he can finally enjoy his honey in peace. At the end of this course, it's all honey and all Pooh (with that awesome music effect!).

Our task in A4 is to first identify the live variables (local declarations and parameters) at each point of the program, and print them at the occurrences of the `/* PRINTLIVEVARIABLES */` query, in lexico-graphically sorted order (refer to the example testcase shared over Moodle). Secondly, in A5, we need to remove assignments made to dead variables by a single pass of dead-code elimination.

3   Evaluation

Your submission must be named `rollnum-ai.zip`, where `rollnum` is your roll-number in small letters, `i` is the number of the assignment. Upon unzipping the submission, we should get a directory named `rollnum-ai`. The main class inside this directory should be named `Main.java`. Your program should read from the standard input and print to the standard output. You can leave all the visitors and syntax-tree nodes as it is, but remember to remove all the `.class` or `.jar` files.

For A4, we would match the output of each testcase with the expected output. For A5, we would count the number of statements and variable declarations.

Your assignments will be graded for a total of 100 marks and then scaled down to the marks mentioned on the course webpage.

4   Plagiarism Warning

You are allowed to discuss publicly on the Slack channel, but are supposed to do the assignment completely individually. We would be using sophisticated plagiarism checkers, and if similarity is found, the penalty used in the course would be as follows:

- First instance: 0 marks in the assignment
- Second instance: F grade in the course