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CS 410 - PROJECT 2 DESIGN REPORT

Description

This project will implement a program that converts context-free grammar to its equivalent Chomsky normal form.

Tools

- Java 15 (JDK-15.0.2): A programming language for the project implementation.
- IntelliJ IDEA 2021.1.1: An Integrated Development Environment (IDE).

Implementation

First, ArrayLists are created to store tuples of the CFG. A scanner reads the input file. Then the program executes these steps:

1. Start sign is removed from RHS. Create a new production as A->S where the new start sign is A if the start symbol S is at the RHS of any production in the grammar.
2. Remove all epsilon, useless, and unit products. Remove any epsilon, unit, or useless production rules from CFG.
3. If terminals are present with non-terminals or other terminals, remove these mixed productions from the RHS. For instance, the production rule X->0Y may be broken down into: X->ZY and Z->0.
4. Eliminate production rules with more than two non-terminals. For instance, X->XYZ can be broken down into X->TZ and T->XY.

Input Format

The input file will be read on the top of the main function in this format:

NON-TERMINAL
S
F
TERMINAL
0
1
RULES
S:00S
S:11F
F:00F
F:e
START
S