TDT4205 Compiler Construction
Assignment 3 (aka Problem Statement 3)

1 LR(0) Automaton Construction

Consider the following grammar
S → E
E → E + T | T
T → int (E) | int

Construct the LR(0) automaton for the above grammar

Identify any shift-reduce conflicts if any

2 Programming Exercise

Note: The uploaded skeleton for this exercise has been made with upcoming exercises in mind. For those who wish to complete them earlier feel free to do so. There will be a separate guidelines document that will be uploaded for this(very soon). For this exercise the only required modification is mentioned below. To run the solution as needed according to the exercise check the main function in vslc (there will be some input arguments to be specified at run time to run the required functions).

2.1 Tree Simplification

The provided skeleton for this exercise is now extended with a function simplify_tree in tree.c availble in the src folder and this function is called from main.c after the initial syntax tree is constructed. Implement the function so that it traverses the tree and makes the modifications mentioned below.

2.1.1 Eliminate nodes of purely syntactic value

Delete nodes with only one child and no meaningful data and associate the child with the parent.

2.1.2 Flattening the list structure

Delete internal nodes of list structures and leave only the parent node with a list type and all list items as children. Print list items can be directly associated with the print statement.

2.1.3 Resolve Constant Expressions

Compute the value of the subtrees representing arithmetic operations with constants and replace them with the value