Compiler Design Lab (CS 511)

Autumn 2021

Assignment 5

Consider the following set of fully parenthesized expressions over non-negative integers with addition (+) and multiplication (\*) operators, and reading input (r) from the stdin.

1. Every non-negative integer (32-bit) is an expression.

2. r is an expression. Its value is the integer read from the stdin.

3. If e1 and e2 are expressions, then so are (e1 + e2) and (e1 \* e2). In both the cases inorder evaluation is performed.

4. Nothing else is an expression. Write “Syntax Error” for erroneous expression.

As an example, the expression ((12+r)\*5) on input 3 from stdin is evaluated to 75. Every expression is followed by ‘\n’ at the end.

Write a flex program(a5.l) to implement the scanner and a bison program(a5.y) to implement the parser. Create a make file as follows and submit the three files.

Makefile:

a5: a5.l a5.y

bison -d a5.y

flex a5.l

cc -o a5 a5.tab.c lex.yy.c -lfl

Run:

$ ./a5

((12+r)\*5)

:3

Value: 75

$ ./a5

12+3\*8

Syntax Error