Introduction to Flex and Bison

Samuel Malec

Overview

- Motivation

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- Lexical analysis using Flex

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- Syntactical analysis using Bison

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- Live Demo

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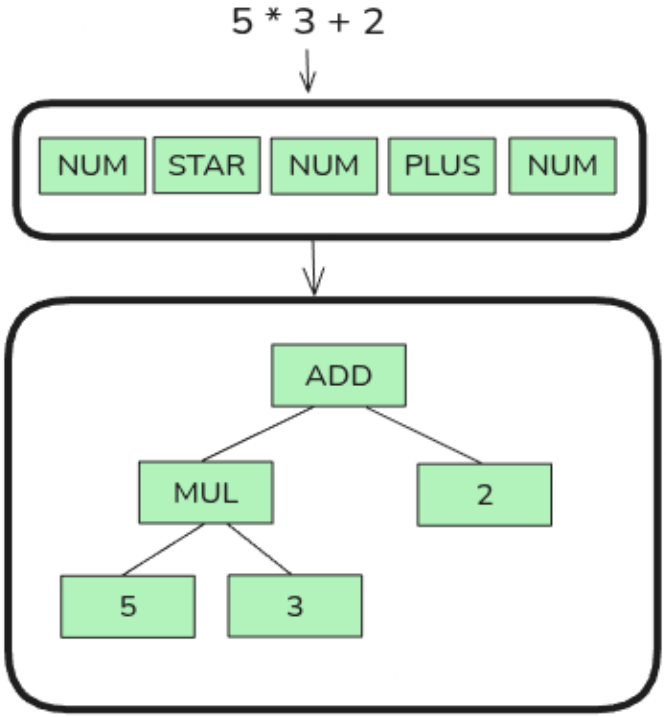

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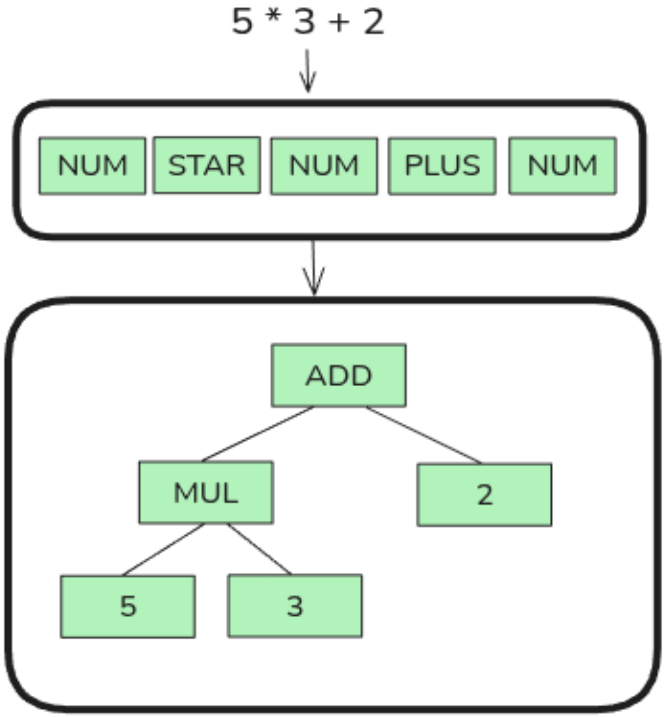

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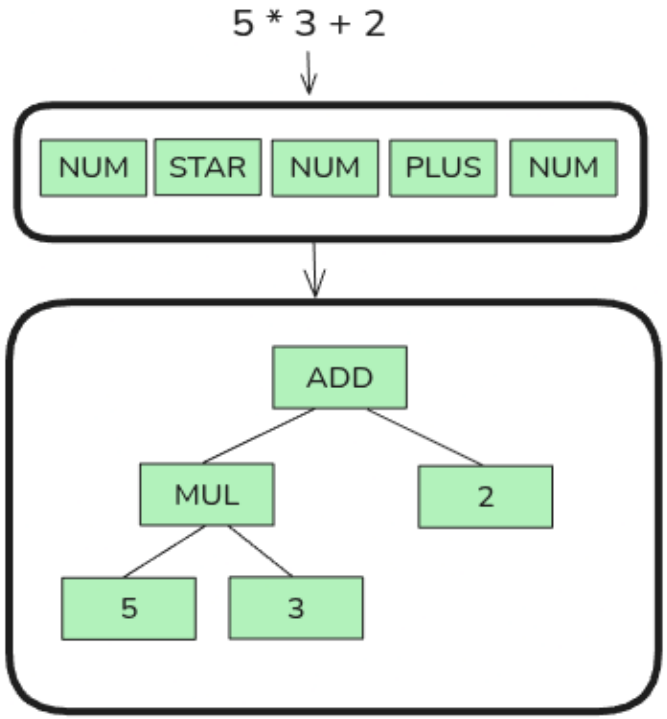
- **Lexers** and **parsers** serve this purpose
- Repetitive and error-prone code
- We can use **automated tools** !



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[0-9]+      { return NUMBER; }
if          { return IF; }
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- **Fast Lex**ical Analyzer (Generator)
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- Users define rules for tokens using **regular expressions**
- Flex produces C functions that return tokens
- Conflicts are resolved using **longest match** and **rule ordering**

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```
%token NUM    // token declaration
%%
// nt : rule {action}
expr : expr '+' term   { $$ = $1 + $3; }
     | expr '-' term   { $$ = $1 - $3; }
     | term;
term : NUM;
%%
```

Live Demo

- We can use Flex and Bison together to create the **frontend** of a compiler
- Let see how to do it in a simple language

Calc

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a = 3;
b = 4;
print(a + b * 2);
print((a + b) * 2);
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Example Calc program

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- A minimal integer calculator
- Supports variables, assignments, arithmetic, parentheses, and a print(expr) statement.
- **Expressions**: '+ - / *' with standard precedence
- Let's look at the implementation!

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