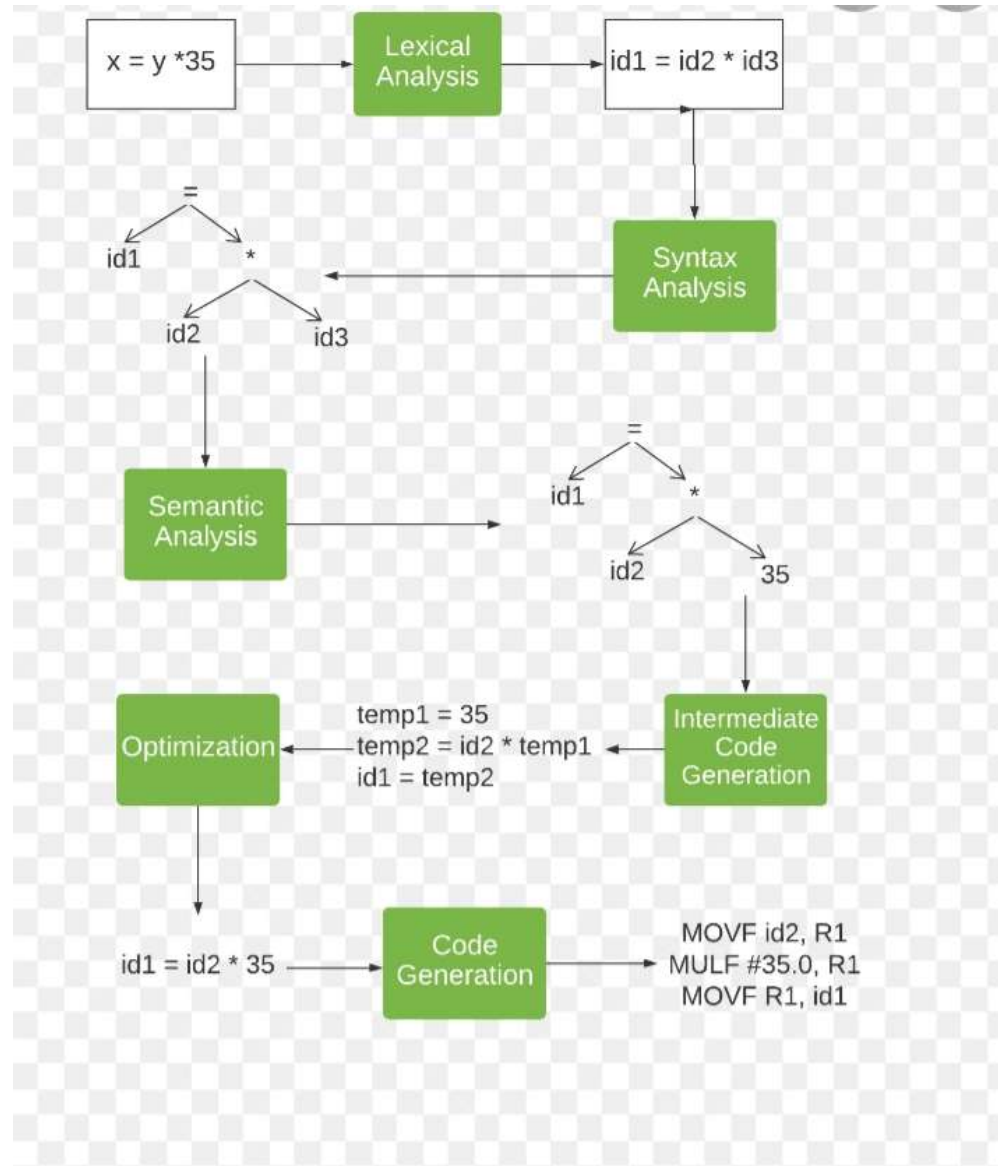




# Example for phases of compiler





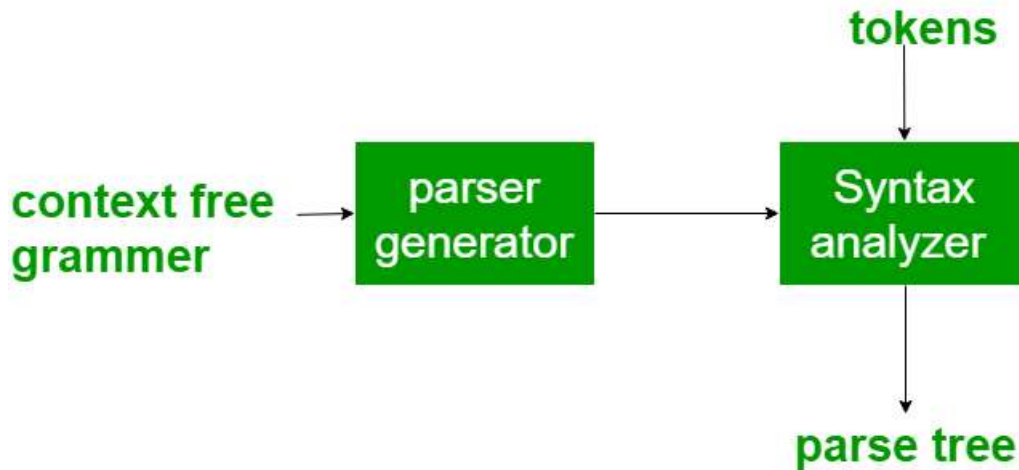
# Compiler Construction Tool

- Compiler tool → implementing the phases of compiler
- Creation of compiler
- Tools
  - Parser generator
  - Scanner generator
  - Syntax-directed Translation Engines
  - Automatic code generator
  - Data-Flow Analysis Engine
  - Compiler Construction Toolkits



# Parser Generator

- Input → grammatical description of a programming language
- Output → Syntax Analyzers
- Example: PIC, EQM



**Syntax Tree Generator**

[Help](#) [License](#) Please send suggestions to mail@mshang.ca

[S [NP Miles] [VP [V ate] [NP\* all the hot dogs]]]

Font style:  Serif  Sans-Serif  Monospace

Font size:

Vertical spacing:

Horizontal spacing:

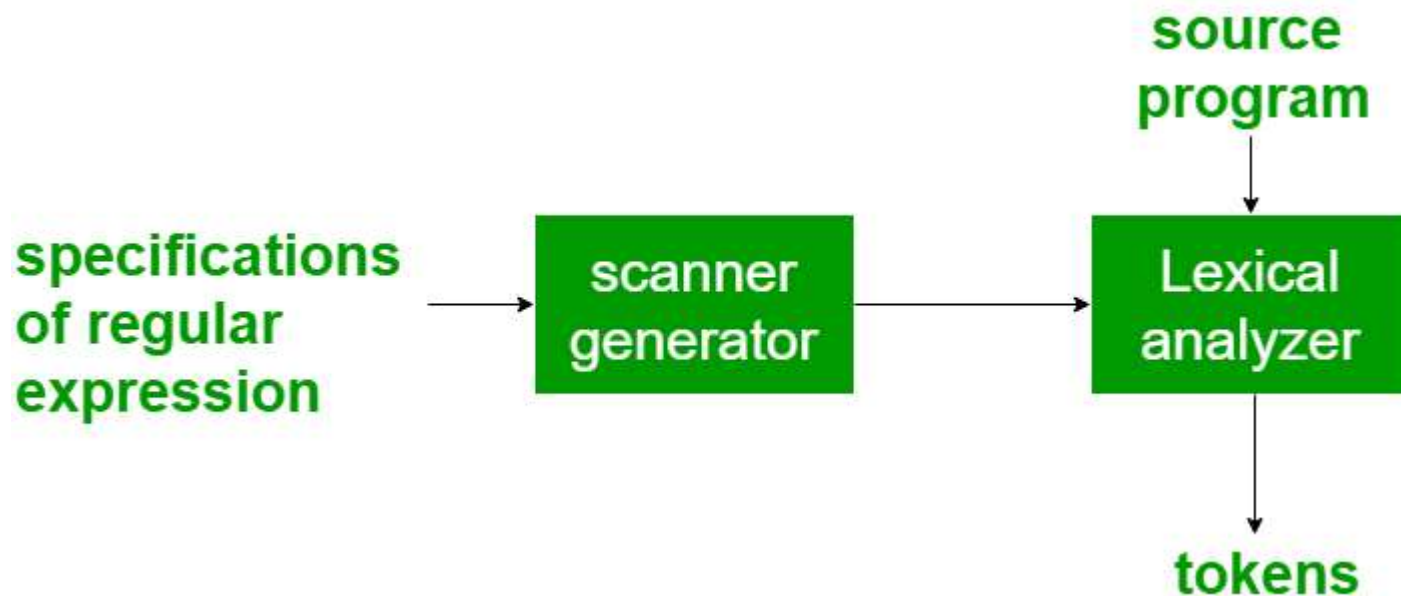
```
graph TD; S --> NP1[NP]; S --> VP1[VP]; NP1 --> Miles[Miles]; VP1 --> V[V]; V --> ate[ate]; VP1 --> NP2[NP]; NP2 --> all[all the hot dogs]
```

The screenshot shows a web application titled 'Syntax Tree Generator'. It includes a text input field containing the sentence 'Miles ate all the hot dogs' with its corresponding parse tree notation: [S [NP Miles] [VP [V ate] [NP\* all the hot dogs]]]. Below the input field are controls for font style (Serif, Sans-Serif, Monospace), font size, vertical spacing, and horizontal spacing. At the bottom, a syntax tree diagram is displayed, showing the hierarchical structure of the sentence: S branches into NP (Miles) and VP (ate, all the hot dogs).



# Scanner Generator

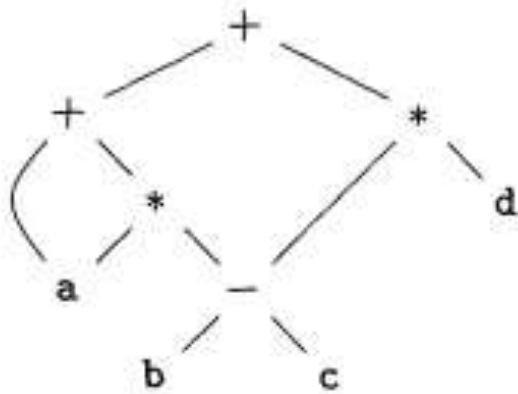
- **Input:** Regular expression description of the tokens of a language  
**Output:** Lexical analyzers.





# Syntax-directed Translation Engines

- Intermediate code (Three Address Format)
- Input: Parse tree.
- Output: Intermediate code.



```
t1 = b - c  
t2 = a * t1  
t3 = a + t2  
t4 = t1 * d  
t5 = t3 + t4
```

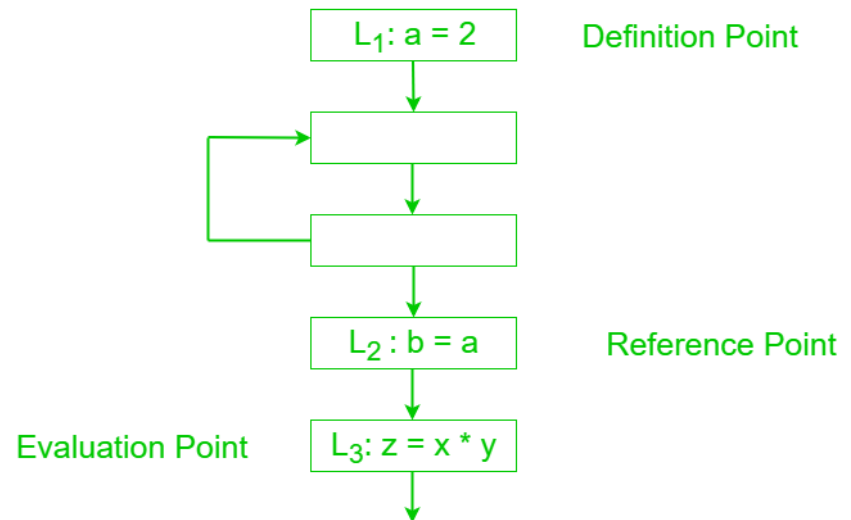


# Automatic code generator

- Input: Intermediate language.
- Output: Machine language.
- Rules  $\rightarrow$  Target code

## Data-Flow Analysis Engine

- Key part of code optimization
- Information - value transferred from one part to other part of the program





# Compiler Construction Toolkits

- Integrated set of routines – phases of compiler

