DSL to C++ Compiler

This project implements a **custom Domain-Specific Language (DSL) compiler** designed to parse and process arithmetic expressions written in a simplified contract-like syntax. The compiler translates the input DSL into equivalent, executable C++ code. It leverages modern compiler construction tools such as **Flex** (for lexical analysis) and **Bison** (for syntax parsing), along with custom components for AST generation, code evaluation, and code generation.

System Requirements

To build and run the DSL-to-C++ compiler, the following tools and libraries are required:

Development Tools

- **CMake** ≥ 3.10

  Used for project configuration and cross-platform build automation.

- **Flex**

  Lexical analyzer for tokenizing the DSL input code.

- **Bison** ≥ 2.3

  Parser generator used to define the grammar and build the Abstract Syntax Tree (AST).

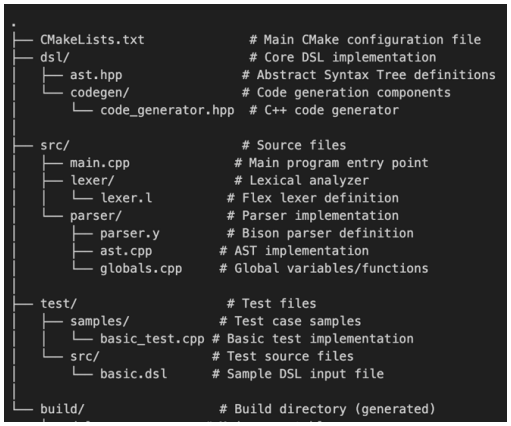
- **C++ Compiler** (with **C++11** support)

  Required to compile the generated C++ code and internal modules of the compiler.

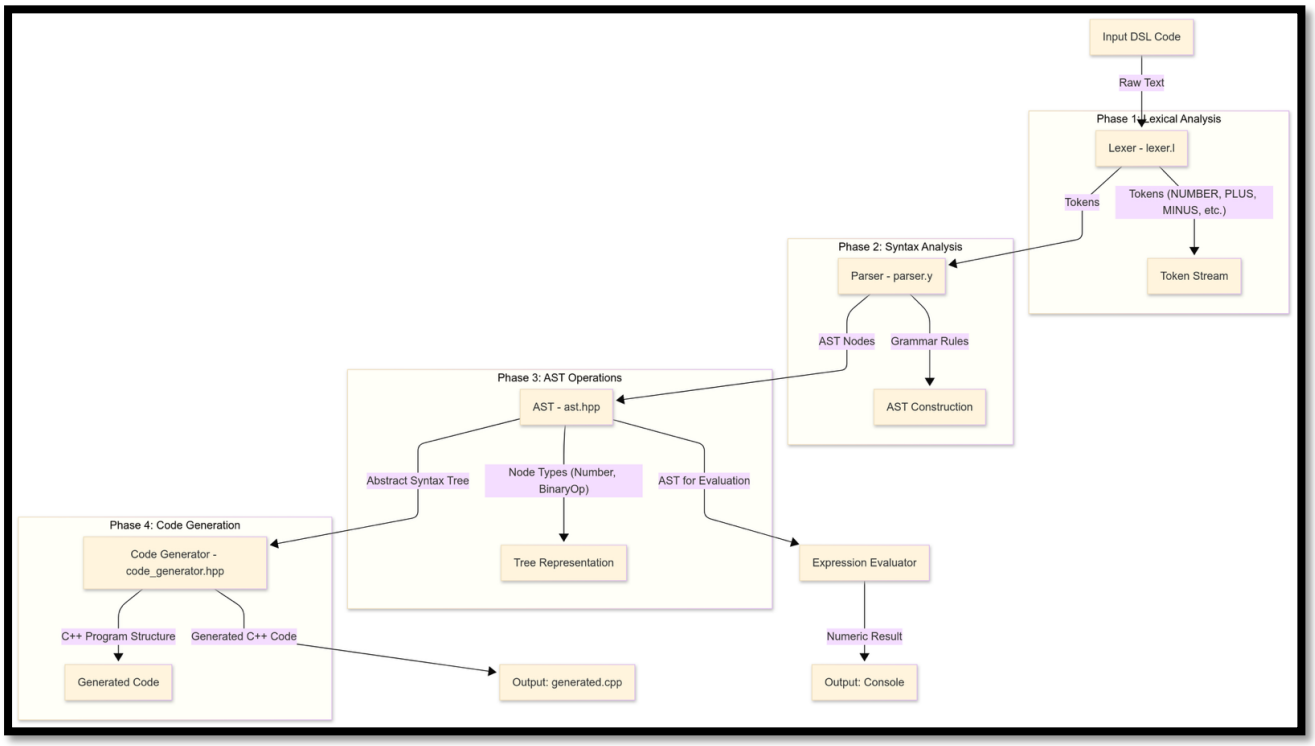
- **Google Test Framework**

  Used for unit testing and validation of core components like the lexer, parser, and AST.

PROJECT ARCHITECTURE



WORKFLOW OF THE PROJECT



Phase	Tool/Component	Role
1	Flex (lexer.l)	Tokenize input DSL
2	Bison (parser.y)	Parse tokens into AST
3	AST (ast.hpp)	Build and evaluate AST
4	Code Generator	Emit C++ code
—	Evaluator	Compute expression results

PREREQUIREMENTS

1.To install cmake,bison,flex and google test command

→brew install cmake flex bison googletest

2.If google test command is not installed follow the steps

→brew install googletest

BUILDING THE PROJECT

1. Create a build directory:

→mkdir build

→cd build

2. Generate build files:

→cmake ..

3. Build the project:

→make

Running the Compiler

1. Create an input file with expressions:

→10*(5-2);

2. Run the compiler:

→./dsl < ../test/src/basic.dsl