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Experiment No. 08

AIM: Study of Syntax Analysis tool: YACC/BISON

Theory:

What is a Parser?

Parsing is the process of matching grammar symbols to elements in the input data, according to the rules of the grammar. The parser obtains a sequence of tokens from the lexical analyzer, and recognizes its structure in the form of a parse tree. The parse tree expresses the hierarchical structure of the input data, and is a mapping of grammar symbols to data elements. Tree nodes represent symbols of the grammar (non-terminals or terminals), and tree edges represent derivation steps.

YACC

YACC stands for **Yet Another Compiler Compiler**. YACC provides a tool to produce a parser for a given grammar. YACC is a program designed to compile a LALR (1) grammar. It is used to produce the source code of the syntactic analyzer of the language produced by LALR (1) grammar. The input of YACC is the rule or grammar and the output is a C program.

These are some points about YACC:

Input: A CFG- file.y

Output: A parser y.tab.c (yacc)

The output file "file.output" contains the parsing tables.

The file "file.tab.h" contains declarations.

The parser called the yyparse ().

Parser expects to use a function called yylex () to get tokens.

The basic operational sequence is as follows:

This file contains the desired grammar in YACC format.

It shows the YACC program.

It is the c source program created by YACC.

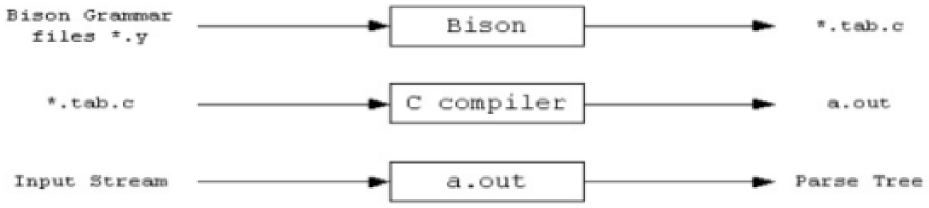
C Compiler

Executable file that will parse grammar given in gram.Y

BISON

BISON is a general-purpose parser generator that converts an annotated context-free grammar into a deterministic LR or generalized LR (GLR) parser employing LALR(1) parser tables. As an experimental feature, Bison can also generate IELR(1) or canonical LR(1)parser tables. Once you are proficient with Bison, you can use it to develop a wide range of language parsers, from those used in simple desk calculators to complex programming languages.Bison is upward compatible with Yacc: all properly-written Yacc grammars ought towork with Bison with no change.

Bison was written originally by Robert Corbett. Richard Stallman made it Yacc-compatible. Wilfred Hansen of Carnegie Mellon University added multi-character string literals and other features.



Steps to use Bison:

Write a lexical analyzer to process input and pass tokens to the parser (calc.lex).

Write the grammar specification for bison (calc.y), including grammar rules, yyparse() and yyerror().

Run Bison on the grammar to produce the parser. (Makefile)

Compile the code output by Bison, as well as any other source files.

Link the object files to produce the finished product.

Conclusion: We have studied about YACC & BISON parser generator.