7. LEX & YACC Program.

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Aim :- Design Lex & yacc program to validate type and syntax of variable declarations in Java.

Problem Statement - Write a program using YACC specifications to implement lexical Analysis phase of compiler to validate syntax & type of variable declarations Java.

Pre-requisites - LEX 110, LEX120, LEX130, LEX140, LEX160, 250.

Software Requirements -

Sr No	Facilities Required	Quantity
1	System	1
2	o/s	Ubuntu kylin.
3	S/w name	FLEX, YACC

Theory :-
- YACC is a computer program for the UNIX operating system developed by stephen.c.

C. Johnson. It is a look Ahead Left-to-Right parser generators, generating a parser, the part of a compiler that tries to make syntactic Sense of the source code,

- Specifically LALR parser, Based on an analytic grammer written in notation Similar to Backus-Naur form (BNF).
- YACC is stupplied as a standard utility on BSD and AT&T UNIX.
- GNU. Based Linux distributions includes Bison, a forward comptible yacc replacement. Yacc is one of the automatic tools for generating the parser program.

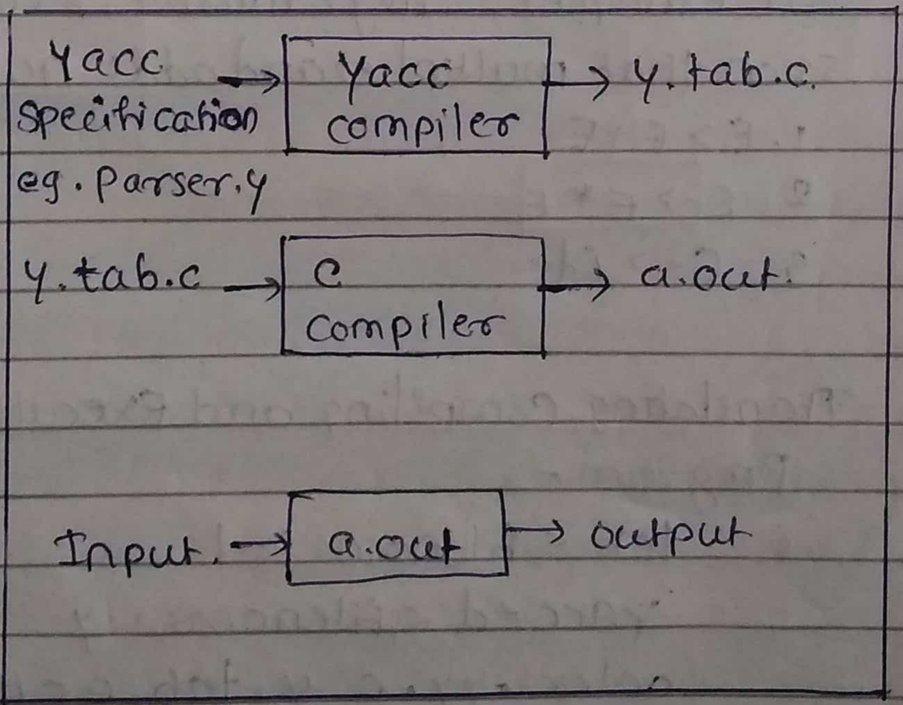


Fig: YACC Parser Generation Model.

Structure of a yacc files : A yacc file looks much like a lex file:

....defination....

%.%.

.... rules....

%.%.

.... codes....

DefinitionsAs with lex, all codes between %.{ and %.} is occeupied to the begning of the resulting c.file. Rules with lex, a number of combinations of pattern and actions. The patterns are now those of a Context-Fee grammer, ratherthan regulargrammer as was in 3 case with lex code.

For examples, thegrammers foran expression that multipliesandadds numbers is:

1. E> E+E.
2. E-> E*E
3. E-> id.

Translating, Compiling and Executing A YACC Program -

```
lex <filename>.l
YACC-d <filename>.y
aclex.yy.c y.tab.c -ll
./a.out.
```

Lexical Analyzer for YACC -

The relevant portion of the lexical analyzer might look like:

```
yylex()
extern int yylval;
int c;
.....

    c = getchar();
   ...switch (c) {
      ...case'0':
         case '1':
         ......
         case '9':
     yylval = c - '0';
     return (DIGIT);
     ....}
```

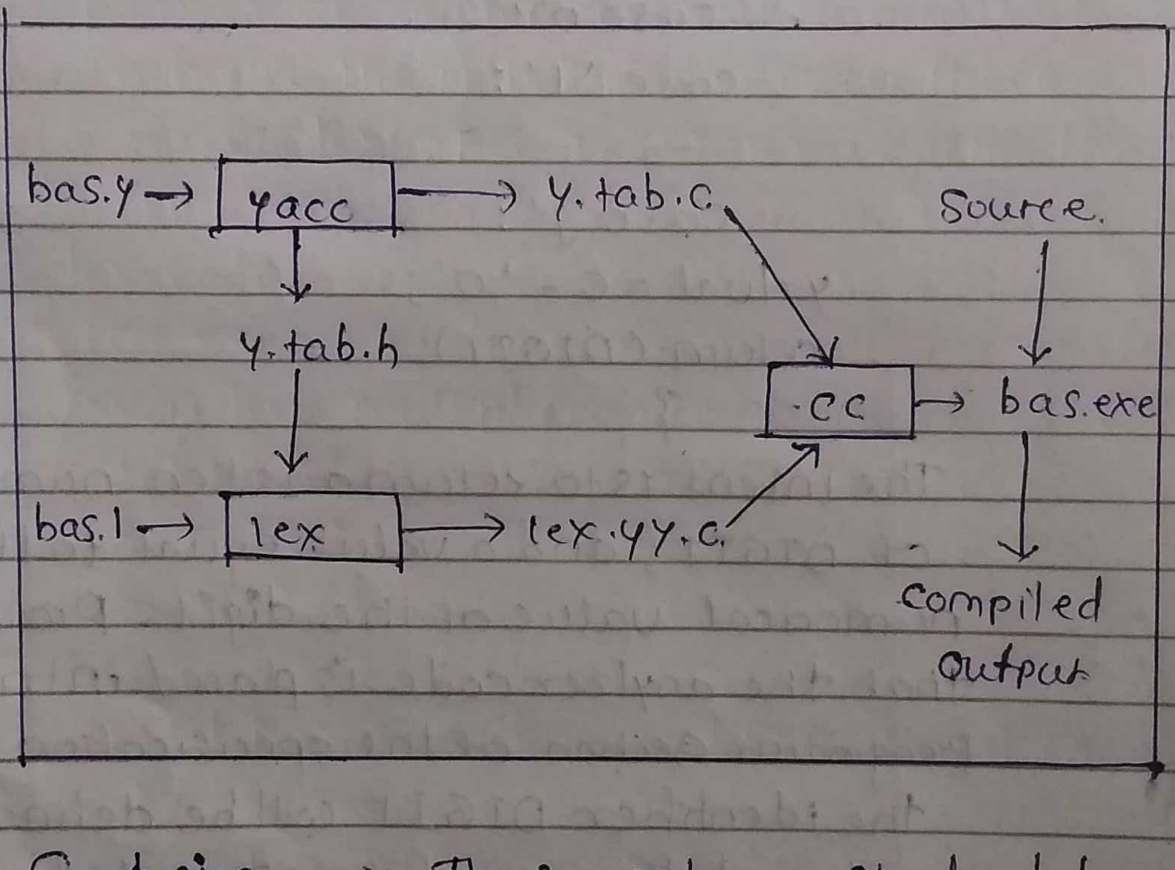
The intent is to return a token numbers of DIGIT, and a value equal to the numerical value of the digit. Provided that the anylzer code is placed in the programs section of the specification files, the identifier DIGIT will be defined as the token number associated with the token DIGIT.

Comparing Sentence Type -

1. Simple sentences is an independent clause with one subject and one verb.

2. The compound sentences is two or more independent clause, joined with comma, semicolon & conjunctions.

Applications -
YAcc is used to generate parser, which are an integral part of compiler.



Conclusion → Thus, we have studied lexical Analyzer, Syntax analysis and implemented lex & yacc application for syntax analyzer to validate the given infix expression.