UE20CS353-CD LAB-1&2

NAME	SRN	CLASS & SECTION
VIJAY J	PES2UG20CS815	6 - J

LEXER.l

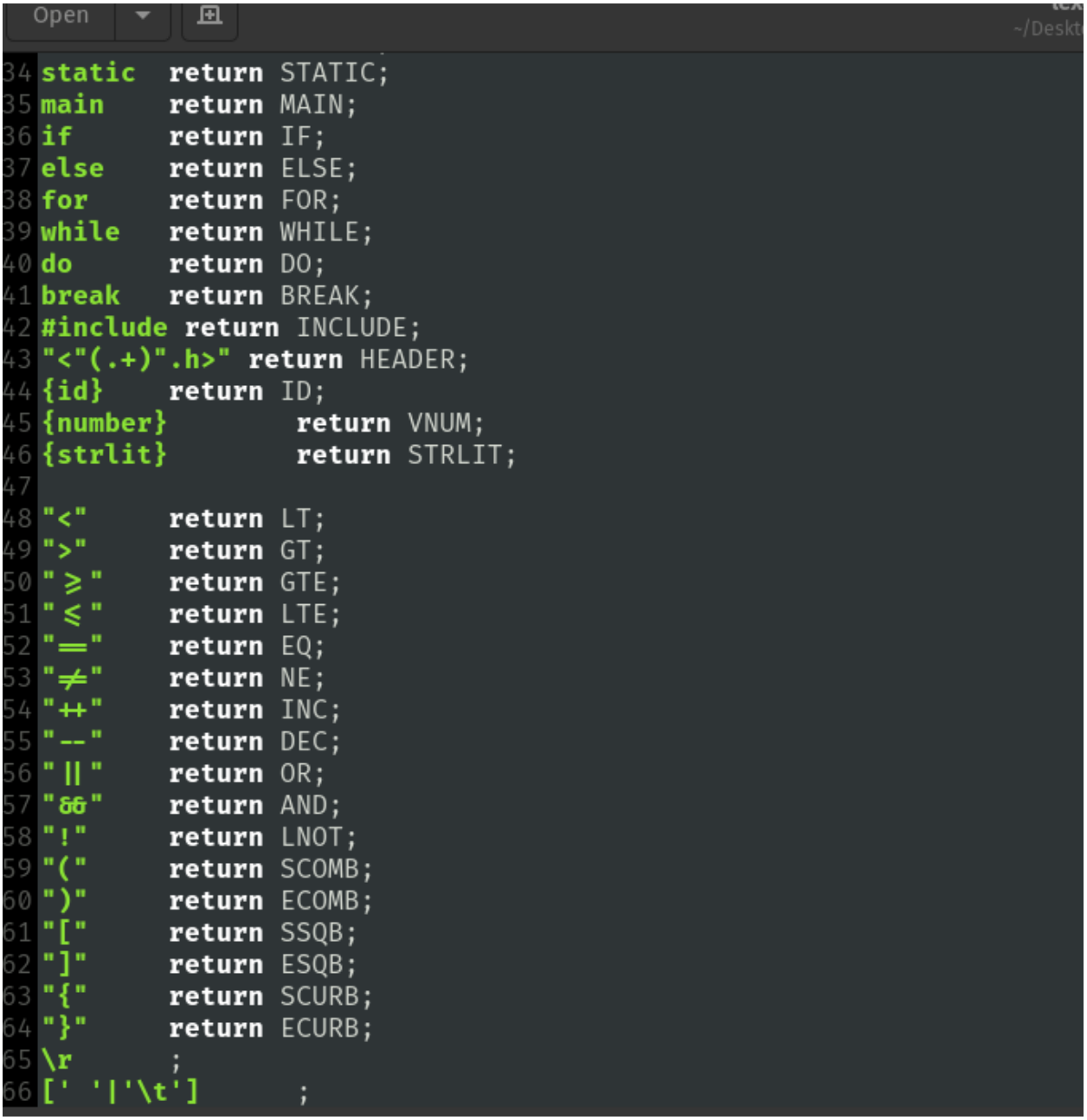
```
%{
// VIJAY J
// PES2UG20CS815
// SECTION J
#include<stdio.h>
#include "y.tab.h"
int yywrap();
int yylineno;
%}


letter [a-zA-Z]
digit [0-9]
id {letter}(_|{letter}|{digit})*
strlit \".*\"
opsign [+-]?
opfrac (\.{digit})?
opexponent ([Ee][+-]?{digit}+)?
number {opsign}{digit}+{opfrac}{opexponent}
start   \/\*
end     \*\/



%%
\/\/(.*) ;
\/\*(.*\n)*.*\*\/  {};

int     return INT;
float   return FLOAT;
char    return CHAR;
bool    return BOOL;
double  return DOUBLE;
```


Open
~/Deskt
34 static return STATIC;
35 main   return MAIN;
36 if   return IF;
37 else   return ELSE;
38 for   return FOR;
39 while   return WHILE;
40 do   return DO;
41 break   return BREAK;
42 #include return INCLUDE;
43 "<"(.+)".h>" return HEADER;
44 {id}   return ID;
45 {number}   return VNUM;
46 {strlit}   return STRLIT;
47
48 "<"   return LT;
49 ">"   return GT;
50 "≥"   return GTE;
51 "≤"   return LTE;
52 "═"   return EQ;
53 "≠"   return NE;
54 "++"   return INC;
55 "--"   return DEC;
56 "||"   return OR;
57 "&&"   return AND;
58 "!"   return LNOT;
59 "("   return SCOMB;
60 ")"   return ECOMB;
61 "["   return SSQB;
62 "]"   return ESQB;
63 "{"   return SCURB;
64 "}"   return ECURB;
65 \r   ;
66 [' '|'\t']   ;

```
\n        ++yylineno;
.         return *yytext;

%%
int yywrap()
{

}
```

PARSER.y

```
%{

//VIJAY J
//PES2UG20CS815
//SECTION J

#include<stdio.h>
#include<stdlib.h>
int yylex();
void yyerror(char* s);
extern int yylineno;
extern char *yytext;
%}
%token INT FLOAT DOUBLE CHAR STATIC ID INCLUDE HEADER MAIN DO WHILE IF ELSE FOR BOOL BREAK INC DEC STRLIT VNUM LT GT GTE LTE EQ NE
OR AND LNOT SCOMB ECOMB SSQB ESQB SCURB ECURB
%start P
%%


P : S {printf("Valid Syntax\n");YYACCEPT;}
  ;
S : INCLUDE HEADER S
  | STATIC S
  | MAINF S
  | DECLR ';' S
  | ASSGN ';' S
  |
  ;

TYPE : INT | FLOAT | CHAR | BOOL | DOUBLE
     ;

DECLR : TYPE List_Var | s
```

```
      ;

List_Var : List_Var ',' ID | ID
         ;

ASSGN : TYPE ID '=' EXPR | ID '=' EXPR | STRLIT
      ;

EXPR : EXPR RELOP E | E | ID INC | ID DEC | LNOT ID|S
     ;

RELOP : GTE|LTE|EQ|NE|OR|AND|LT|GT
      ;

E : E'+'T|E'-'T|T
  ;

T : T'*'F|T'/'F|F
  ;


F : SCOMB EXPR ECOMB | ID | VNUM
  ;

MAINF : TYPE MAIN SCOMB Empty_ListVar ECOMB SCURB Stmt ECURB
     ;

Empty_ListVar : List_Var
              |
              ;

Stmt : SingleStmt Stmt | Block Stmt | BREAK
     |
```

```
    ;

Ifelstmt : SingleStmt Stmt | Block Stmt
         ;


SingleStmt : DECLR ';' | ASSGN ';' | IF SCOMB COND ECOMB Ifelstmt | IF SCOMB COND ECOMB Ifelstmt ELSE Ifelstmt | LOOP | DO Block
WHILE COND ';'
           ;

Block : SCURB Stmt ECURB
      ;

LOOP : WHILE SCOMB COND ECOMB LOOP2
     | FOR SCOMB COND ECOMB LOOP2
     ;

COND : EXPR | ASSGN
    ;

LOOP2 : SCURB Stmt ECURB
      |
      ;

s : error;
%%
void yyerror(char* s)
{
printf("Error:%s,line number:%d,token:%s\n",s,yylineno,yytext);
}

int main()
{
```

```
95
96 int main()
97 {
98 yyparse();
99
100 }
101
```

Makefile.mk

```
a.exe: y.tab.c lex.yy.c
	gcc y.tab.c lex.yy.c
y.tab.c: parser.y
	bison -dy parser.y -Wno
lex.yy.c: lexer.l  y.tab.h
	flex lexer.l
```

Lab - 1
TestCase - 1

Valid

```
yoyo@zaemon in ~/Desktop/valid via C v12.2.1-gcc took 2ms
λ make -f makefile.mk
bison -dy parser.y -Wno
flex lexer.l
gcc y.tab.c lex.yy.c

yoyo@zaemon in ~/Desktop/valid via C v12.2.1-gcc took 401ms
λ ./a.out < lab-1_test-1_valid.c
Valid Syntax

yoyo@zaemon in ~/Desktop/valid via C v12.2.1-gcc took 1ms
λ _
```

Invalid

```
yoyo@zaemon in ~/Desktop/invalid via C v12.2.1-gcc took 2ms
λ make -f makefile.mk
bison -dy parser.y -Wno
flex lexer.l
gcc y.tab.c lex.yy.c

yoyo@zaemon in ~/Desktop/invalid via C v12.2.1-gcc took 429ms
λ ./a.out < lab-1_test-1_invalid.c
Error:syntax error,line number:10,token:if
Error:syntax error,line number:15,token:else
Error:syntax error,line number:19,token:}
Error:syntax error,line number:24,token:}
Error:syntax error,line number:38,token:}

yoyo@zaemon in ~/Desktop/invalid via C v12.2.1-gcc took 2ms
λ _
```

TestCase - 2

Valid

```
┌─yoyo@zaemon in ~/Desktop/valid via C v12.2.1-gcc took 2ms
└─λ make -f makefile.mk
gcc y.tab.c lex.yy.c

┌─yoyo@zaemon in ~/Desktop/valid via C v12.2.1-gcc took 203ms
└─λ ./a.out < lab-1_test-2_valid.c
Valid Syntax

┌─yoyo@zaemon in ~/Desktop/valid via C v12.2.1-gcc took 1ms
└─λ _
```

Invalid

```
┌─yoyo@zaemon in ~/Desktop/invalid via C v12.2.1-gcc took 2ms
└─λ make -f makefile.mk
gcc y.tab.c lex.yy.c

┌─yoyo@zaemon in ~/Desktop/invalid via C v12.2.1-gcc took 207ms
└─λ ./a.out < lab-1_test-2_invalid.c
Error:syntax error,line number:7,token:-
Error:syntax error,line number:12,token::
Error:syntax error,line number:13,token::
Error:syntax error,line number:26,token:*
Error:syntax error,line number:39,token:}

┌─yoyo@zaemon in ~/Desktop/invalid via C v12.2.1-gcc took 2ms
└─λ _
```

Lab - 2

input.c

```c
#include<stdio.h>
int main()
{
    int a=20;
    int b=10;
    int c=a+b;
    printf("c=%d\n",c);
    return 0;
}
```

Valid:

```
yoyo@zaemon in ~/Desktop/Lab2/valid via C v12.2.1-gcc
λ make -f makefile.mk
gcc y.tab.c lex.yy.c

yoyo@zaemon in ~/Desktop/Lab2/valid via C v12.2.1-gcc took 993ms
λ ./a.out < input_valid.c
Error:syntax error,line number:7,token:(
Valid Syntax
```

Invalid:

```
yoyo@zaemon in ~/Desktop/Lab2/invalid via C v12.2.1-gcc took 2ms
λ make -f makefile.mk
bison -dy parser.y -Wno
flex lexer.l
gcc y.tab.c lex.yy.c

yoyo@zaemon in ~/Desktop/Lab2/invalid via C v12.2.1-gcc took 423ms
λ ./a.out < input_invalid.c
Error:syntax error,line number:1,token:<
Error:syntax error,line number:6,token:(

yoyo@zaemon in ~/Desktop/Lab2/invalid via C v12.2.1-gcc took 1ms
λ _
```