System Software and Compiler Design
Lab Assignment 7

Name: Tushar Mittal

PRN: 1032200956

Roll No: PB68

Panel: B

Batch: B2

Code:

lexer.l

```
%{
#include "y.tab.h"
extern int yylval;
%}

%%

"if"    { return IF; }
```

```
"("      { return OPEN_PAREN; }
")"      { return CLOSE_PAREN; }
"else"   { return ELSE; }
[a-zA-Z]+ { return IDENTIFIER; }
[0-9]+    { return NUMBER; }
"="      { return ASSIGN_OP; }
";"      { return SEMICOLON; }
.        { /* ignore everything else */ }

%%

int yywrap() {
    return 1;
}
}
```

parser.y

```
%{
#include <stdio.h>
extern int yylex();
void yyerror(const char *s);
%}

%token IF
%token ELSE
%token OPEN_PAREN
%token CLOSE_PAREN
%token IDENTIFIER
%token NUMBER
%token ASSIGN_OP
%token SEMICOLON
```

```
%nonassoc THEN
%nonassoc ELSE

%%

program:
    program statement
    |
    ;

statement:
    IF OPEN_PAREN condition CLOSE_PAREN statement %prec THEN
    | IF OPEN_PAREN condition CLOSE_PAREN statement ELSE statement
    | assignment SEMICOLON
    ;

assignment:
    IDENTIFIER ASSIGN_OP NUMBER
    ;

condition:
    IDENTIFIER
    | NUMBER
    ;

%%

void yyerror(const char *s) {
    fprintf(stderr, "Error: %s\n", s);
}
```

```
int main() {
    if (!yyparse()) {
        printf("Valid if-else statements!\n");
    } else {
        printf("Invalid if-else statements!\n");
    }
    return 0;
}
```

Input:

1. if (x) y = 1; else y = 2;
2. if ((x y) = 1; else z = 2

Output:

1. Valid if-else statements!
2. Error: syntax error
   Invalid if-else statements!

```
tusharmittal@LAPTOP-ONVQFQKH:/mnt/c/Users/Tushar Mittal/Desktop/ssc/Assignment7$ flex lexer.l
tusharmittal@LAPTOP-ONVQFQKH:/mnt/c/Users/Tushar Mittal/Desktop/ssc/Assignment7$ yacc -d parser.y
tusharmittal@LAPTOP-ONVQFQKH:/mnt/c/Users/Tushar Mittal/Desktop/ssc/Assignment7$ gcc lex.yy.c y.tab.c -ll
tusharmittal@LAPTOP-ONVQFQKH:/mnt/c/Users/Tushar Mittal/Desktop/ssc/Assignment7$ ./a.out < input_code1.txt
Valid if-else statements!
tusharmittal@LAPTOP-ONVQFQKH:/mnt/c/Users/Tushar Mittal/Desktop/ssc/Assignment7$ ./a.out < input_code2.txt
Error: syntax error
Invalid if-else statements!
tusharmittal@LAPTOP-ONVQFQKH:/mnt/c/Users/Tushar Mittal/Desktop/ssc/Assignment7$
```