

Laboratory-3

Question-1

Write a code for syntax analysis of if and if-else conditional constructs in C.

Lex File (lex.l):

```
%{
#include "y.tab.h"
}%
%%
"if"          { return IF; }
"else"        { return ELSE; }
"("           { return LPAREN; }
")"           { return RPAREN; }
[a-zA-Z][a-zA-Z0-9]* { printf("%s\n",yytext);return ID; }
.             ;
%%
int yywrap() {
    return 1;
}
```

Yacc File (par.y):

```
%{
#include <stdio.h>
#include <stdlib.h>
extern int yylex();
extern int yyparse();
extern FILE* yyin;
void yyerror(const char*);
#define YYSTYPE YYSTYPE
#define YYDEBUG 1
typedef struct {
    char* str;
} YYSTYPE;
}%
%token IF LPAREN RPAREN ELSE ID
%%
program : statement;
statement : if_statement
          | ID
          ;
if_statement : IF LPAREN ID RPAREN statement
             | IF LPAREN ID RPAREN statement ELSE statement
             ;
%%
void yyerror(const char *s) {
    printf("Error!\n");
    exit(0);
}
int main() {
```

```

FILE* input_file = fopen("sample.c", "r");
yyin = input_file;
yyparse();
printf("success\n");
fclose(input_file);
return 0;
}

```

Sample File (sample.c):

```

if (askdfjalksfj){
    fihaskjf
}
else{
    sofjalsjf
}

```

Output:

```

● kal-el@mos-13:~/Desktop/Compilers/Compilers Lab/Lab3/q1$ ./parser
askdfjalksfj

```

```

fihaskjf

```

```

sofjalsjf

```

```

success

```

Result:

Code for syntax analysis of conditional constructs was implemented successfully.

Question-2

Write code for syntax analysis of while loop constructs in C.

Lex File (lex.l):

```

%{
#include "y.tab.h"
%}
%%
"while"          { return WHILE; }
"("              { return LPAREN; }
")"              { return RPAREN; }
[a-zA-Z][a-zA-Z0-9]* { printf("%s\n",yytext); return ID; }
.                ;
%%
int yywrap() {
    return 1;
}

```

Yacc File (par.y):

```
%{
#include <stdio.h>
#include <stdlib.h>
extern int yylex();
extern int yyparse();
extern FILE* yyin;
void yyerror(const char*);
#define YYSTYPE YYSTYPE
#define YYDEBUG 1
typedef struct {
    char* str;
} YYSTYPE;
}%
%token WHILE LPAREN RPAREN ID
%%
statement : WHILE LPAREN ID RPAREN statement
          | ID
          ;
%%
void yyerror(const char *s) {
    printf("Error!\n");
    exit(0);
}
int main() {
    FILE* input_file = fopen("sample.c", "r");
    yyin = input_file;
    yyparse();
    printf("success\n");
    fclose(input_file);
    return 0;
}
```

Sample File (sample.c):

```
while(dgs) {
    dgdshs
}
```

Output:

```
● kal-el@mos-13:~/Desktop/Compilers/Compilers Lab/Lab3/q2$ ./parser
dgs

dgdshs

success
```

Result:

Code for syntax analysis of loop constructs was implemented successfully.