Department of

Computer Science and Engineering

Lab Assignment – 03

Course No. : CSE-354

Course Title : Compiler Design Laboratory

Name of Experiment: Report on Solving Problems using Yacc

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Session : 2017-18

Date : 02-01-2022

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Problem:

Write a Yacc program that takes Boolean expressions as input [as given by the following grammar] and produces the truth value of the expressions.

bexpr → bexpr **or** bterm | bterm
bterm → bterm **and** bfactor | bfactor
bfactor → **not** bfactor | (bexpr) | **true** | **false**

You can use the following sample Boolean expressions to test your parser:

Input: true and (false or true) and not false **Output:** true	**Input:** false or true and false **Output:** false
Input: true or false and true **Output:** true	**Input:** true and false or true **Output:** true
Input: the and and **Output:** Compilation Error	

Lex Program:

```
#include<stdio.h>
void yyerror(char *);
#include "y.tab.h"
%}

AND [Aa][Nn][Dd]
OR [Oo][Rr]
NOT [Nn][Oo][Tt]
TRUE [Tt][Rr][Uu][Ee]
FALSE [Ff][Aa][Ll][Ss][Ee]

%%
```

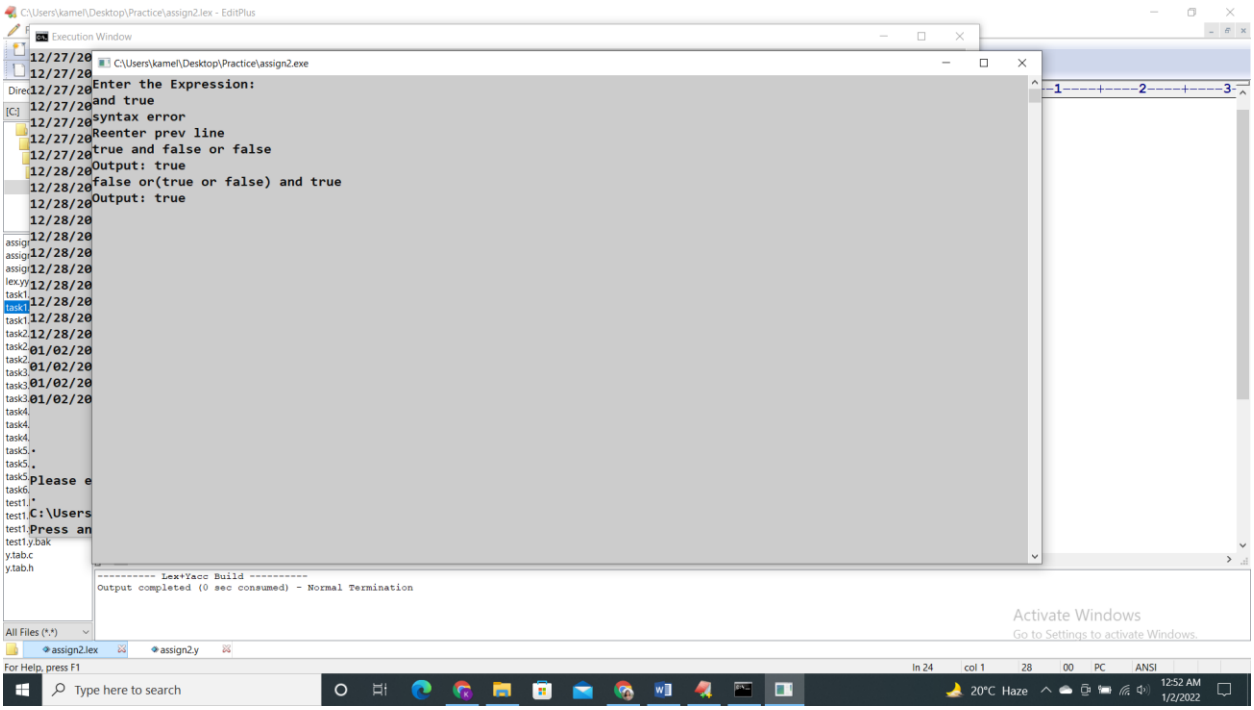
```
{AND} { return (AND); }
{OR} { return (OR); }
{NOT} { return (NOT); }
{TRUE} { yylval = 1; return (TRUE); }
{FALSE} { yylval = 0; return (FALSE); }

[()\n] return *yytext;
[ \t] ; /* skip whitespace */
.       yyerror("invalid character");

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

Yacc Program:

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

%token AND OR NOT TRUE FALSE

%%

line:
     line bexpr '\n' {if ($1 >= 1) {
                         printf("Output: true\n");}
                    else{
                        printf("Output: false\n");}
                     }      | line '\n'
    |
    |error '\n' {yyerror("Reenter prev line"); yyerrok;}
    ;
```

```
bexpr: bexpr OR bterm { $$ = $1 + $3; }
        | bterm { $$ = $1;}
        ;

bterm: bterm AND bfactor { $$ = $1 & $3;}
        | bfactor { $$ = $1; }
        ;
bfactor: NOT bfactor { $$ = ! $2; }
        | '(' bexpr ')' { $$ = $2; }
        | TRUE { $$ = $1; }
        | FALSE {$$ = $1; }
        ;

%%

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

int main(void)
{
printf("Enter the Expression:\n");
yyparse();
return 0;
}
```

Output:


C:\Users\kamel\Desktop\Practice\assign2.exe
Enter the Expression:
and true
syntax error
Reenter prev line
true and false or false
Output: true
false or(true or false) and true
Output: true
---------- Lex*Yacc Build ----------
Output completed (0 sec consumed) - Normal Termination
Activate Windows
Go to Settings to activate Windows.
Type here to search
20°C Haze
12:52 AM
1/2/2022