NOTRE DAME UNIVERSITY

BANGLADESH

CSE-3104 LAB Report-05

Course Title: Compiler Design Lab

Course Code: CSE-3104

Submitted by:

Name: Istiak Alam

ID: 0692230005101005

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Lab Task Topic: Compiler Problem Solving using Lex

Submitted to:

Khorshed Alam
Lecturer, NDUB

Problem:

Write a YACC Program to implement for-loop.

Solution:

Code : –

```
// Lex File -→ forloop.l //
%{
#include "y.tab.h"
#include <stdlib.h>
%}

alpha [a-zA-Z]
digit [0-9]

%%
[\t\n]
for return FOR;
{digit}+ return NUM;
{alpha}({alpha}|{digit})* return ID;
"<=" return LE;
">=" return GE;
"==" return EQ;
"!=" return NE;
"||" return OR;
"&&" return AND;
. return yytext[0];
%%

int yywrap()
{
    return 0;
}
```

```
// Yacc File → forloop.y //
%{
#include <stdio.h>
#include <stdlib.h>

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

%token ID FOR NUM LE GE EQ NE OR AND
%right '=' UMINUS
%left AND OR '<''>' LE GE EQ NE '+''-''*''/''!'

%%
S:
ST { printf("For Loop Statement Input Accepted.\n");
     exit(0); }
;

ST:
FOR '(' E ';' E2 ';' E ')' DEF;
DEF: '{' BODY '}'
|E ';'
|ST
|
;

BODY:
```

```
 BODY BODY
|E ';'
|ST
|
;

E:
 ID '=' E
|E '+' E
|E '-' E
|E '*' E
|E '/' E
|E '<' E
|E '>' E
|E LE E
|E GE E
|E EQ E
|E NE E
|E OR E
|E AND E
|E '+''+'
|E '-''-'
|ID
|NUM
;

E2:
 E '<' E
|E '>' E
|E LE E
|E GE E
|E EQ E
|E NE E
|E OR E
|E AND E
|ID
|NUM
;
%%

int main()
{
    printf("Output");
    yyparse();
    return 0;
}
```

Code Processing –

Step 1 : Open terminal in Linux and create a lex file named **forloop.l**

⇒ **`touch forloop.l`**

Step 1 : Open terminal in Linux and create a yacc file named **forloop.y**

⇒ **`touch forloop.y`**

Step 2 : After Writing those code save it and type command in terminal :

⇒ **`bison -d forloop.y`**

⇒ **`lex forloop.l`**

Step 3 : It will create a lex.yy.c & yyfile. Then next type command in terminal

⇒ **`gcc -o ForLoop forloop.tab.c lex.yy.c -lfl -lm`**

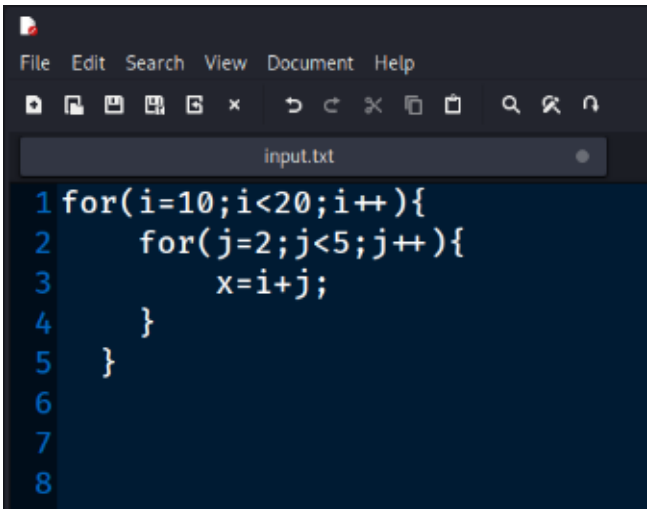
Step 4 : Then it will create an executable file named **ForLoop.exe**.

Step 5 : Next type command in terminal and run the exe file :

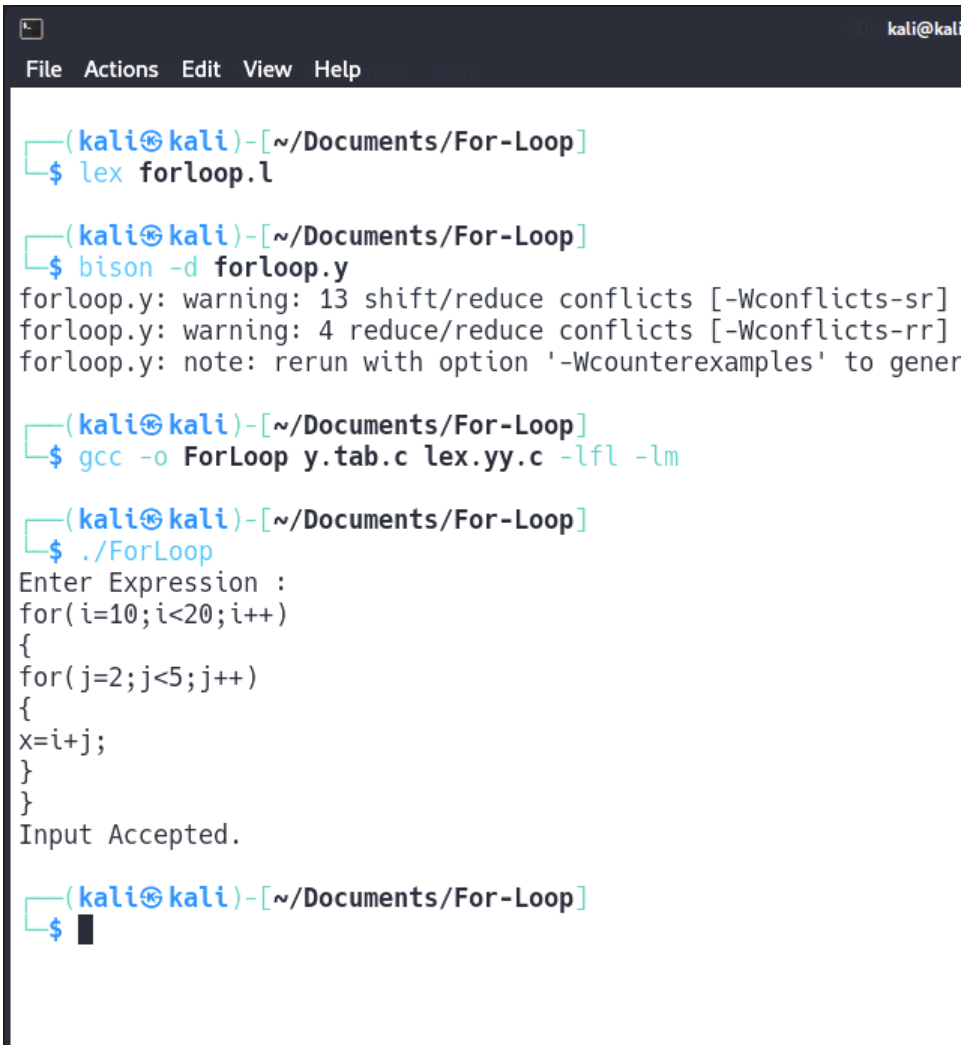
⇒ **`./ForLoop < input.txt`**

Input and Output:

1. We are using **input.txt** file for checking out inputs in this lexical analyzer.
2. In the **input.txt** file there are a simple program language –



3. After injecting the input, the output is –



Output