

Experiment 21

```
%{  
  
#include <stdio.h>  
  
  
int char_count = 0, word_count = 0, line_count = 0;  
  
%}  
  
  
%%  
  
  
\n    { line_count++; char_count++; } // Count lines  
[ \t]+ { char_count++; }           // Count spaces and tabs  
[A-Za-z0-9]+ { word_count++; char_count += yyleng; } // Count words and add their length  
.    { char_count++; }             // Count all other characters  
  
%%  
  
  
int yywrap() {  
    return 1; // Indicate end of input  
}  
  
  
int main() {  
    printf("Enter the input (Press Ctrl+D to end):\n");  
    yylex(); // Process input  
    printf("\nCharacters: %d\nWords: %d\nLines: %d\n", char_count, word_count, line_count);  
    return 0;  
}
```

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.26100.3194]
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D:\cd lab\lex program>flex exp21.l
D:\cd lab\lex program>gcc lex.yy.c
D:\cd lab\lex program>a
Enter the input (Press Ctrl+D to end):
hi good morning
how are you
i am fine
^Z

Characters: 40
Words: 9
Lines: 3
D:\cd lab\lex program>
```

Experiment 22

```
%{
#include <stdio.h>

int comment_count = 0;
FILE *outfile;
%}

%%

"/".* { comment_count++; } // Remove single-line comments
"/"*[^\]*"*[^\]*"/* { comment_count++; } // Remove multi-line comments
.|\\n { fputc(yytext[0], outfile); } // Write non-comment text

%%

int main() {
    FILE *infile;
```

```

char filename[100];

printf("Enter input C file: ");
scanf("%s", filename);

infile = fopen(filename, "r");
outfile = fopen("exp22.c", "w");

if (!infile || !outfile) {
    printf("Error opening file!\n");
    return 1;
}

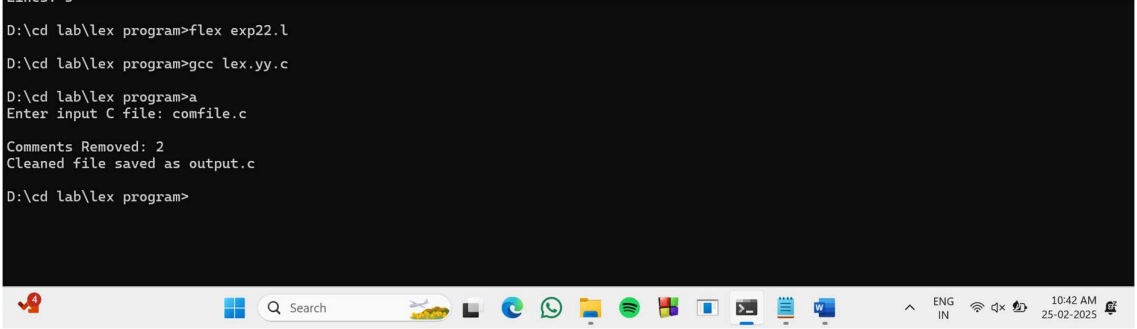
yyin = infile;
yylex();

fclose(infile);
fclose(outfile);

printf("\nComments Removed: %d\nCleaned file saved as output.c\n", comment_count);
return 0;
}

int yywrap() {
    return 1;
}

```



```

D:\cd lab\lex program>flex exp22.l
D:\cd lab\lex program>gcc lex.yy.c
D:\cd lab\lex program>a
Enter input C file: comfile.c
Comments Removed: 2
Cleaned file saved as output.c
D:\cd lab\lex program>

```

Experiment 23

```
%{  
  
#include <stdio.h>  
  
%}  
  
%%  
  
[A-Z]+ { printf("Capital Word: %s\n", yytext); } // Match full uppercase words  
[a-zA-Z]+ ; // Ignore other words  
\n    ; // Ignore new lines  
.    ; // Ignore any other characters  
  
%%  
  
int main() {  
    printf("Enter text: ");  
    yylex();  
    return 0;  
}  
  
int yywrap() {  
    return 1;  
}
```

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.26100.3194]
(c) Microsoft Corporation. All rights reserved.

D:\cd lab\lex program>flex exp23.l
D:\cd lab\lex program>gcc lex.yy.c
D:\cd lab\lex program>a
Enter text: Tanuja
^Z

D:\cd lab\lex program>flex exp23.l
D:\cd lab\lex program>gcc lex.yy.c
D:\cd lab\lex program>a
Enter text: HELLO
Capital Word: HELLO
```

Experiment 24

```
%{
#include <stdio.h>

%}

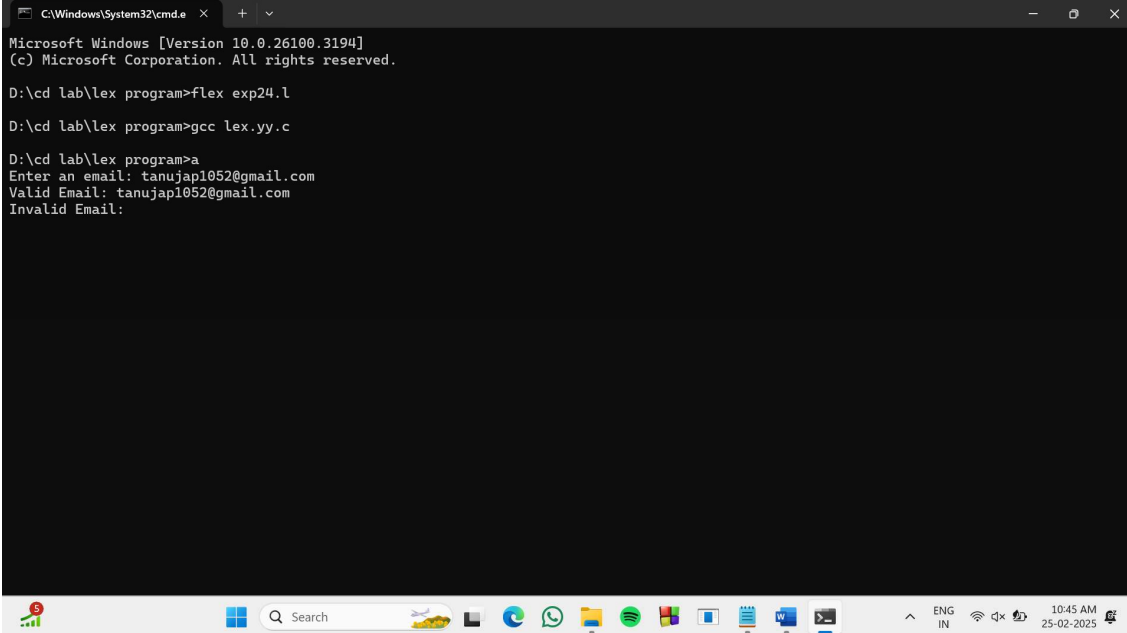
%%

[A-Za-z0-9._%+-]+@[A-Za-z0-9.-]+\.[A-Za-z]{2,} { printf("Valid Email: %s\n", yytext); }
.|\\n { printf("Invalid Email: %s\n", yytext); }

%%

int main() {
    printf("Enter an email: ");
    yylex();
    return 0;
}
```

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



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.26100.3194]
(c) Microsoft Corporation. All rights reserved.

D:\cd lab\lex program>flex exp24.l

D:\cd lab\lex program>gcc lex.yy.c

D:\cd lab\lex program>a
Enter an email: tanujap1052@gmail.com
Valid Email: tanujap1052@gmail.com
Invalid Email:
```

Experiment 25

```
%{
#include <stdio.h>
%}

%%

abc  { printf("ABC"); } // Replace "abc" with "ABC"
.    { printf("%s", yytext); } // Print other characters unchanged
\n   { printf("\n"); } // Handle new lines

%%

int main() {
```

```

printf("Enter the input string:\n");

yylex();

return 0;
}

```

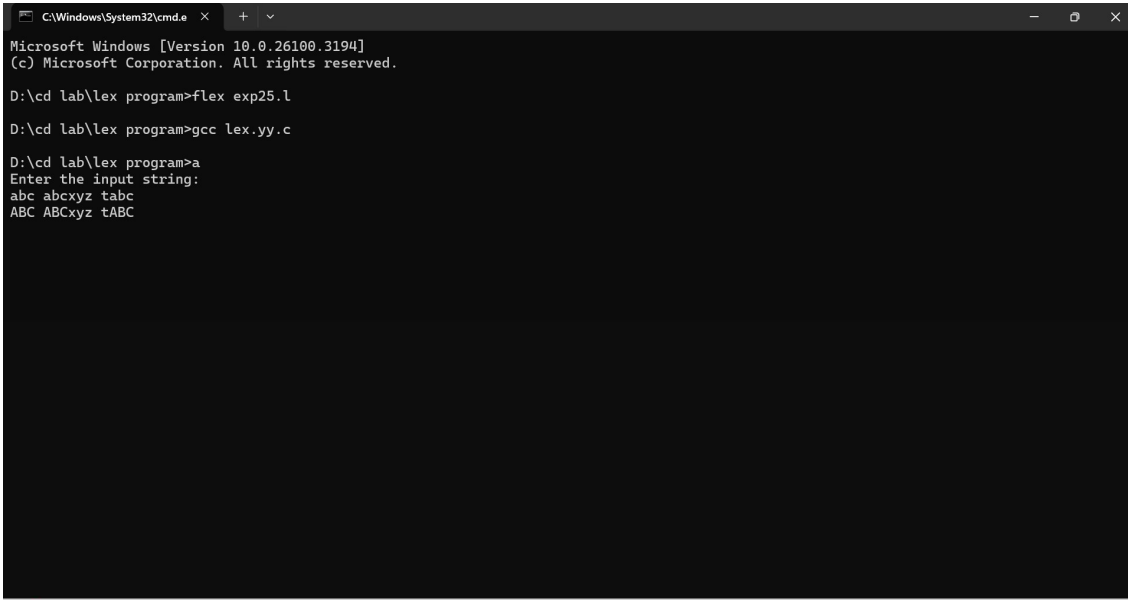
```

int yywrap() {

    return 1;

}

```



The screenshot shows a Windows command prompt window with the following text:

```

C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.26100.3194]
(c) Microsoft Corporation. All rights reserved.

D:\cd lab\lex program>flex exp25.l
D:\cd lab\lex program>gcc lex.yy.c
D:\cd lab\lex program>a
Enter the input string:
abc abxyz tabc
ABC ABCxyz tABC

```

The taskbar at the bottom shows the Windows Start button, a search bar, and several application icons. The system tray on the right indicates the language is English (IN), the time is 10:46 AM, and the date is 25-02-2025.

Experiment 26

```

%{

#include <stdio.h>

%}

%%

// Identifiers (Variable & Function Names)
[a-zA-Z_][a-zA-Z0-9_]* { printf("<IDENTIFIER> : %s\n", yytext); }

```

```

// Numbers (Integer and Floating Point)
[0-9]+          { printf("<INTEGER>    : %s\n", yytext); }
[0-9]+ "." [0-9]+  { printf("<FLOAT>      : %s\n", yytext); }


// Operators
[+\-*/=<>!\&|]+  { printf("<OPERATOR>   : %s\n", yytext); }


// Ignore Whitespace
[ \t\n]+         { /* Ignore spaces, tabs, and newlines */ }


%%


int main() {
    printf("Enter a C program (Press Ctrl+D to finish input):\n");
    yylex();
    return 0;
}


int yywrap() {
    return 1;
}

```

Experiment 27

```

%{
#include <stdio.h>
#include <stdlib.h>
%}


%%

[789][0-9]{9}  { printf("Valid mobile number: %s\n", yytext); }
[0-9]+         { printf("Invalid mobile number: %s\n", yytext); }

```

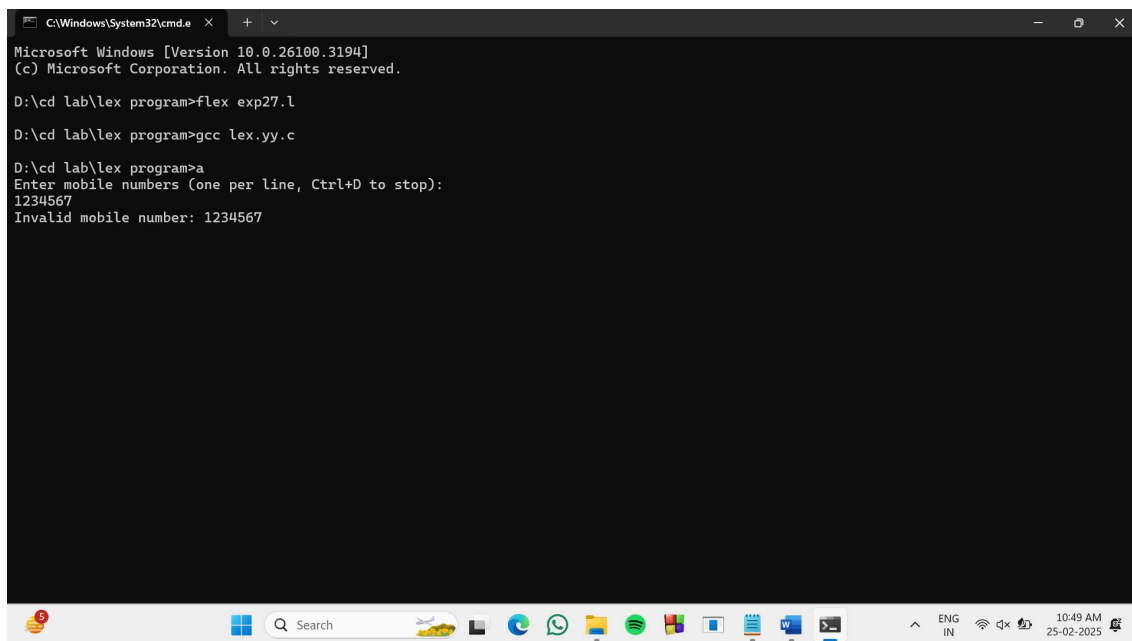


```
.      { /* Ignore other characters */ }
```

```
%%
```

```
int main() {  
    printf("Enter mobile numbers (one per line, Ctrl+D to stop):\n");  
    yylex();  
    return 0;  
}
```

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



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.26100.3194]
(c) Microsoft Corporation. All rights reserved.

D:\cd lab\lex program>flex exp27.l
D:\cd lab\lex program>gcc lex.yy.c
D:\cd lab\lex program>a
Enter mobile numbers (one per line, Ctrl+D to stop):
1234567
Invalid mobile number: 1234567
```

Experiment 28

```
%{
```

```
#include <stdio.h>
```

```
int vowel_count = 0, consonant_count = 0;
```

```
%}
```

```
%%
```

```
[aAeEiIoOuU] { vowel_count++; }
```

```
[b-df-hj-np-tv-zB-DF-HJ-NP-TV-Z] { consonant_count++; }
```

```
. { /* Ignore everything else */ }
```

```
%%
```

```
int main() {
```

```
    printf("Enter text: ");
```

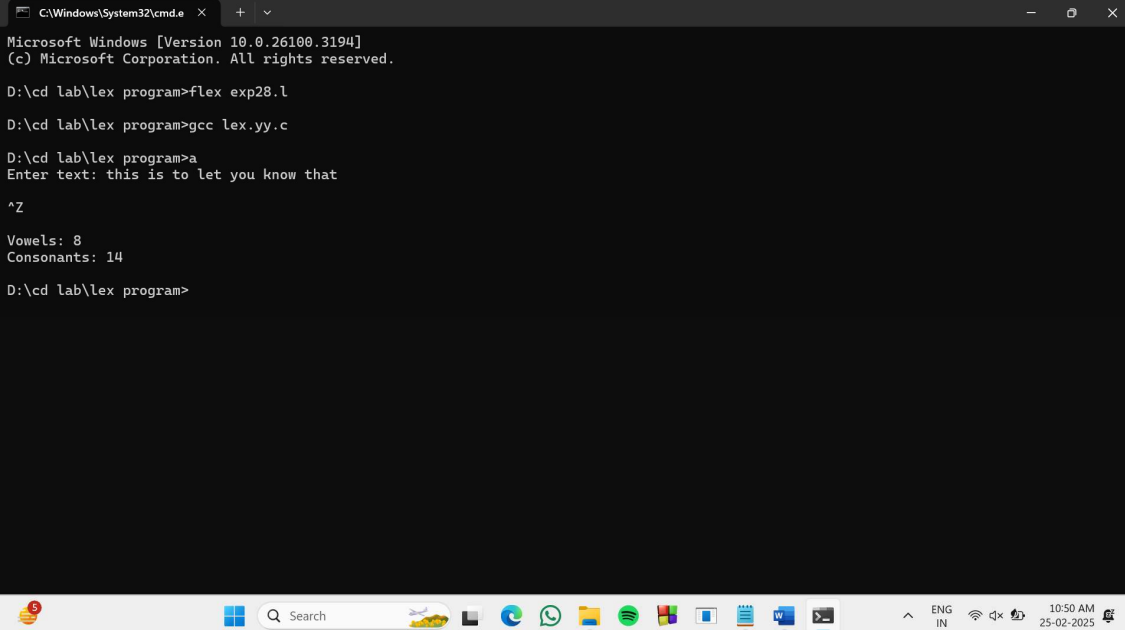
```
    yylex();
```

```
    printf("\nVowels: %d\nConsonants: %d\n", vowel_count, consonant_count);
```

```
    return 0;
```

```
}
```

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



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.26100.3194]
(c) Microsoft Corporation. All rights reserved.

D:\cd lab\lex program>flex exp28.l
D:\cd lab\lex program>gcc lex.yy.c
D:\cd lab\lex program>a
Enter text: this is to let you know that
^Z

Vowels: 8
Consonants: 14
D:\cd lab\lex program>
```

Experiment 29

```
%{
#include <stdio.h>

#include <stdlib.h>

#include <string.h>


#define MAX_KEYWORDS 34


// List of C keywords

const char *keywords[MAX_KEYWORDS] = {

    "auto", "break", "case", "char", "const", "continue", "default", "do",

    "double", "else", "enum", "extern", "float", "for", "goto", "if",

    "inline", "int", "long", "register", "restrict", "return", "short", "signed",

    "sizeof", "static", "struct", "switch", "typedef", "union", "unsigned", "void", "volatile", "while"

};


// Function to check if a token is a keyword

int is_keyword(char *word) {

    for (int i = 0; i < MAX_KEYWORDS; i++) {

        if (strcmp(word, keywords[i]) == 0) {

            return 1;

        }

    }

    return 0;

}

%}

%option noyywrap

%%

// Match keywords and identifiers
```

```
[a-zA-Z_][a-zA-Z0-9_]* {
    if (is_keyword(yytext))
        printf("Keyword: %s\n", yytext);
    else
        printf("Identifier: %s\n", yytext);
}
```

```
[ \t\n] ; // Ignore whitespace
```

```
. ; // Ignore other characters
```

```
%%
```

```
int main() {
    char filename[100];

    // Ask user for file name
    printf("Enter the C file name: ");
    scanf("%99s", filename); //
    FILE *input = fopen(filename, "r");
    if (!input) {
        printf("Error: Cannot open file %s\n", filename);
        return 1;
    }
}
```

```
yyin = input; // Set input file for lexer
yylex();     // Perform lexical analysis
```

```
fclose(input);
return 0;
```

```
}
```

Experiment 30

```
%{  
#include <stdio.h>  
%}  
  
%%  
[0-9]+ { printf("Number: %s\n", yytext); }  
[a-zA-Z]+ { printf("Word: %s\n", yytext); }  
[ \t\n] ; // Ignore whitespace characters  
. ; // Ignore any other character  
  
%%  
  
int main() {  
    printf("Enter a statement:\n");  
    yylex();  
    return 0;  
}  
  
int yywrap() {  
    return 1;  
}
```

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.26100.3194]
(c) Microsoft Corporation. All rights reserved.

D:\cd lab\lex program>flex exp30.l

D:\cd lab\lex program>gcc lex.yy.x
gcc: error: lex.yy.x: No such file or directory
gcc: fatal error: no input files
compilation terminated.

D:\cd lab\lex program>gcc lex.yy.c

D:\cd lab\lex program>a
Enter a statement:
hi how are you , are you well
Word: hi
Word: how
Word: are
Word: you
Word: are
Word: you
Word: well
|
```

Experiment 31

```
%{
#include <stdio.h>

int pos_count = 0, neg_count = 0;

}%

%%

[-]?[0-9]+ {
    if (yytext[0] == '-')
        neg_count++;
    else
        pos_count++;
}

[\\t\\n]; // ignore whitespace
.; // ignore other characters

%%
```

```

int main() {

    printf("Enter numbers:\n");

    yylex();

    printf("\nPositive numbers: %d\n", pos_count);

    printf("Negative numbers: %d\n", neg_count);

    return 0;

}

```

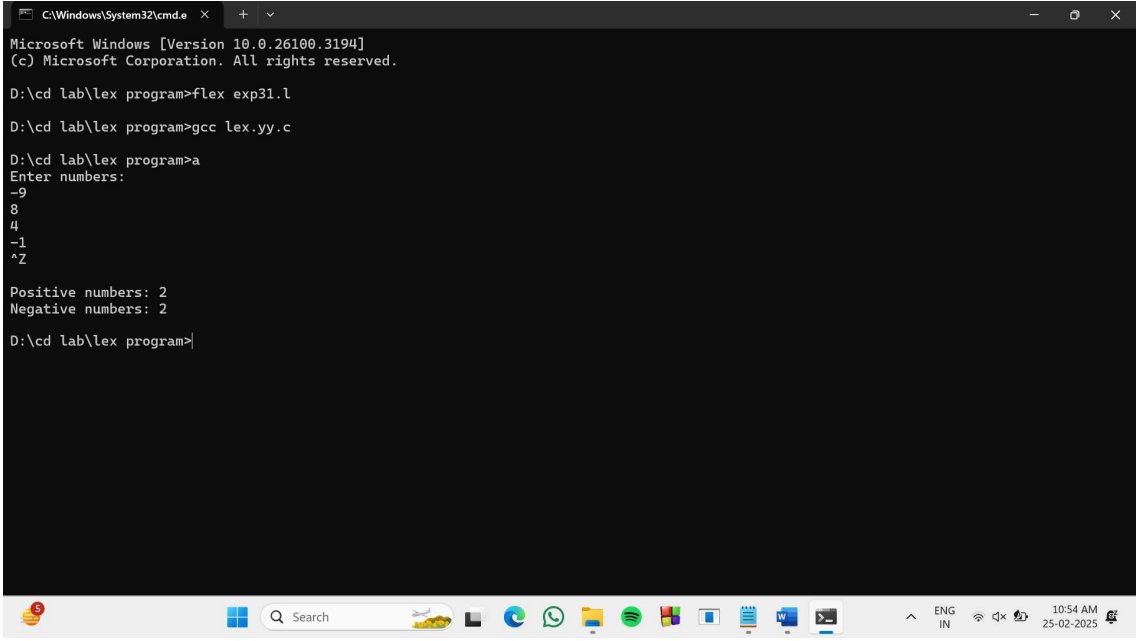
```

int yywrap() {

    return 1;

}

```



```

C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.26100.3194]
(c) Microsoft Corporation. All rights reserved.

D:\cd lab\lex program>flex exp31.l
D:\cd lab\lex program>gcc lex.yy.c
D:\cd lab\lex program>a
Enter numbers:
-9
8
4
-1
^Z

Positive numbers: 2
Negative numbers: 2
D:\cd lab\lex program>

```

Experiment 32

```
%{
```

```
#include <stdio.h>
```

```
%}
```

```
%%
```

```

https?:/[a-zA-Z0-9.-]+\.[a-zA-Z]{2,6}/[a-zA-Z0-9#?=&]*)? {
    printf("Valid URL: %s\n", yytext);
}
. ; // Ignore other characters

```

```
%%
```

```

int main() {
    printf("Enter a URL:\n");
    yylex();
    return 0;
}

```

```

int yywrap() {
    return 1;
}

```

Experiment 33

```

%{
#include <stdio.h>
%}

```

```

%%
[0-9] { printf("Input is a digit: %s\n", yytext); }
. { printf("Input is NOT a digit: %s\n", yytext); }

```

```
%%
```

```

int main() {
    printf("Enter a character:\n");
    yylex();
    return 0;
}

```

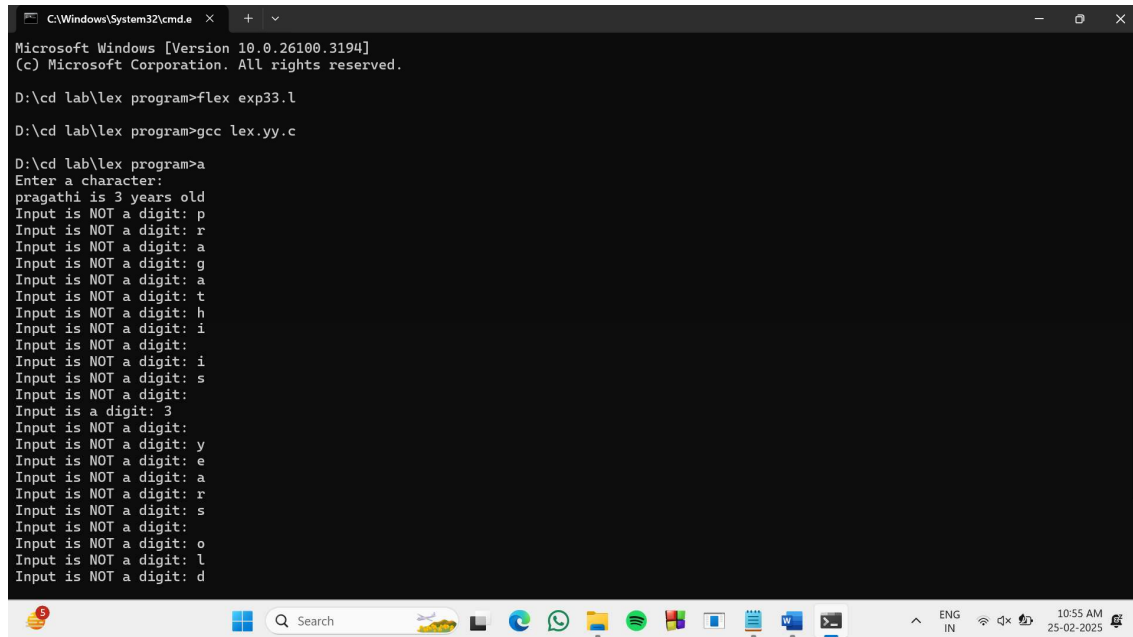


```
}
```

```
int yywrap() {
```

```
    return 1;
```

```
}
```



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.26100.3194]
(c) Microsoft Corporation. All rights reserved.

D:\cd lab\lex program>flex exp33.l
D:\cd lab\lex program>gcc lex.yy.c

D:\cd lab\lex program>a
Enter a character:
pragathi is 3 years old
Input is NOT a digit: p
Input is NOT a digit: r
Input is NOT a digit: a
Input is NOT a digit: g
Input is NOT a digit: a
Input is NOT a digit: t
Input is NOT a digit: h
Input is NOT a digit: i
Input is NOT a digit: i
Input is NOT a digit: s
Input is NOT a digit: s
Input is a digit: 3
Input is NOT a digit:
Input is NOT a digit: y
Input is NOT a digit: e
Input is NOT a digit: a
Input is NOT a digit: r
Input is NOT a digit: s
Input is NOT a digit:
Input is NOT a digit: o
Input is NOT a digit: l
Input is NOT a digit: d
```

Experiment 34

```
%{
```

```
#include <stdio.h>
```

```
%}
```

```
%%
```

```
(0[1-9]|[12][0-9]|3[01])[0-9]{2} {
```

```
    printf("Valid DOB: %s\n", yytext);
```

```
}
```

```
.;
```

```
%%
```

```
int main() {
    printf("Enter DOB in DD-MM-YYYY format:\n");
    yylex();
    return 0;
}
```

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

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.26100.3194]
(c) Microsoft Corporation. All rights reserved.

D:\cd lab\lex program>flex exp34.l
D:\cd lab\lex program>gcc lex.yy.c
D:\cd lab\lex program>a
Enter DOB in DD-MM-YYYY format:
10-03-2010
Valid DOB: 10-03-2010
```

Experiment 35

```
%{
#include <stdio.h>
%}

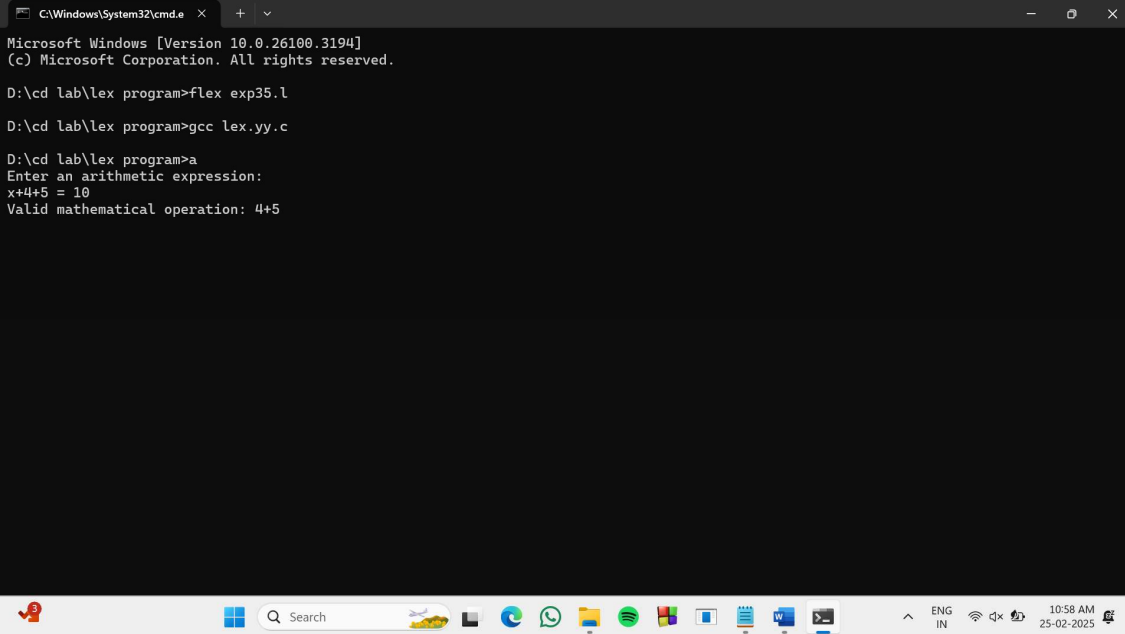
%%

[0-9]+[+\-*/][0-9]+ { printf("Valid mathematical operation: %s\n", yytext); }
.;
```

```
%%
```

```
int main() {  
    printf("Enter an arithmetic expression:\n");  
    yylex();  
    return 0;  
}
```

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



The screenshot shows a Windows command prompt window with the following text:

```
C:\Windows\System32\cmd.exe  
Microsoft Windows [Version 10.0.26100.3194]  
(c) Microsoft Corporation. All rights reserved.  
  
D:\cd lab\lex program>flex exp35.l  
D:\cd lab\lex program>gcc lex.yy.c  
D:\cd lab\lex program>a  
Enter an arithmetic expression:  
**4+5 = 10  
Valid mathematical operation: 4+5
```

The window title bar indicates the path C:\Windows\System32\cmd.exe. The taskbar at the bottom shows various application icons and the system clock displays 10:58 AM on 25-02-2025.

Experiment 36

```
%{  
#include <stdio.h>  
%}  
  
%%
```

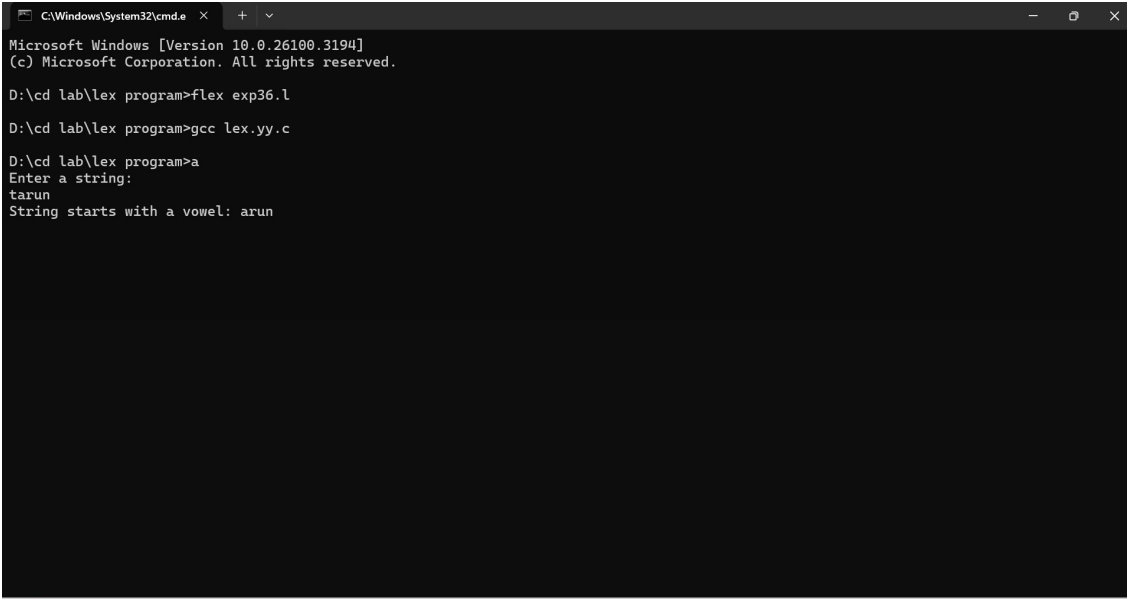
```
[aeiouAEIOU][a-zA-Z]* { printf("String starts with a vowel: %s\n", yytext); }
```

```
.;
```

```
%%
```

```
int main() {  
    printf("Enter a string:\n");  
    yylex();  
    return 0;  
}
```

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



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.26100.3194]
(c) Microsoft Corporation. All rights reserved.

D:\cd lab\lex program>flex exp36.l
D:\cd lab\lex program>gcc lex.yy.c
D:\cd lab\lex program>a
Enter a string:
tarun
String starts with a vowel: arun
```

Experiment 37

```
%{  
  
#include <stdio.h>  
  
#include <string.h>  
  
  
int max_length = 0;  
  
%}  
  
%%  
  
[a-zA-Z]+ {  
    int len = strlen(yytext);  
    if (len > max_length) max_length = len;  
}  
  
.;  
  
%%  
  
int main() {  
    printf("Enter a sentence:\n");  
    yylex();  
    printf("Longest word length: %d\n", max_length);  
    return 0;  
}  
  
int yywrap() {  
    return 1;  
}
```

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.26100.3194]
(c) Microsoft Corporation. All rights reserved.

D:\cd lab\lex program>flex exp37.l
D:\cd lab\lex program>gcc lex.yy.c
D:\cd lab\lex program>a
Enter a sentence:
hi good morning , how are you ?
^Z
Longest word length: 7
D:\cd lab\lex program>|
```

Experiment 38

```
%{
#include <stdio.h>
#include <string.h>

char target[100];
int count = 0;
%}

%%

[a-zA-Z]+ {
    if (strcmp(yytext, target) == 0) count++;
}

.;

%%

int main() {
```

```

printf("Enter the word to count: ");

scanf("%s", target);

printf("Enter a sentence:\n");

yylex();

printf("Frequency of '%s': %d\n", target, count);

return 0;
}

```

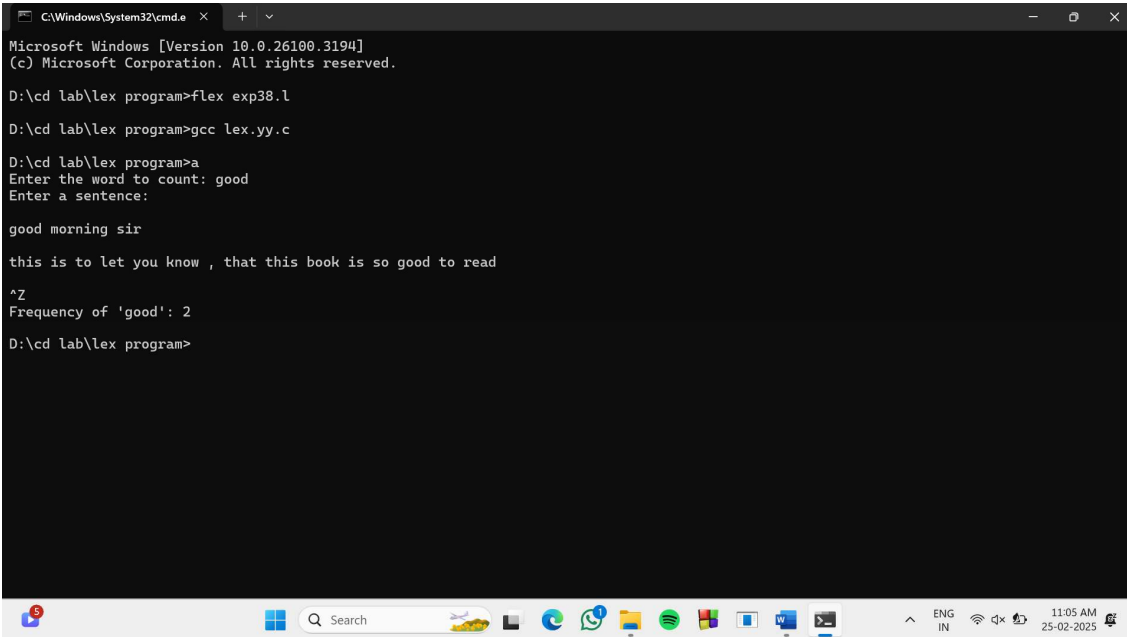
```

int yywrap() {

    return 1;

}

```



```

C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.26100.3194]
(c) Microsoft Corporation. All rights reserved.

D:\cd lab\lex program>flex exp38.l
D:\cd lab\lex program>gcc lex.yy.c
D:\cd lab\lex program>a
Enter the word to count: good
Enter a sentence:
good morning sir
this is to let you know , that this book is so good to read
^Z
Frequency of 'good': 2
D:\cd lab\lex program>

```

Experiment 39

```

%{

#include <stdio.h>

#include <string.h>

char find[100], replace[100];

```

```
%}
```

```
%%
```

```
[a-zA-Z]+ {  
    if (strcmp(yytext, find) == 0)  
        printf("%s ", replace);  
    else  
        printf("%s ", yytext);  
}  
. { printf("%s", yytext); }
```

```
%%
```

```
int main() {  
    printf("Enter the word to replace: ");  
    scanf("%s", find);  
    printf("Enter the replacement word: ");  
    scanf("%s", replace);  
    printf("Enter text:\n");  
    yylex();  
    return 0;  
}
```

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



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.26100.3194]
(c) Microsoft Corporation. All rights reserved.

D:\cd lab\lex program>flex exp39.l
D:\cd lab\lex program>gcc lex.yy.c
D:\cd lab\lex program>a
Enter the word to replace: dog
Enter the replacement word: cat
Enter text:
this dog is so cute
this cat is so cute
```

Experiment 40

```
%{
#include <stdio.h>
%}

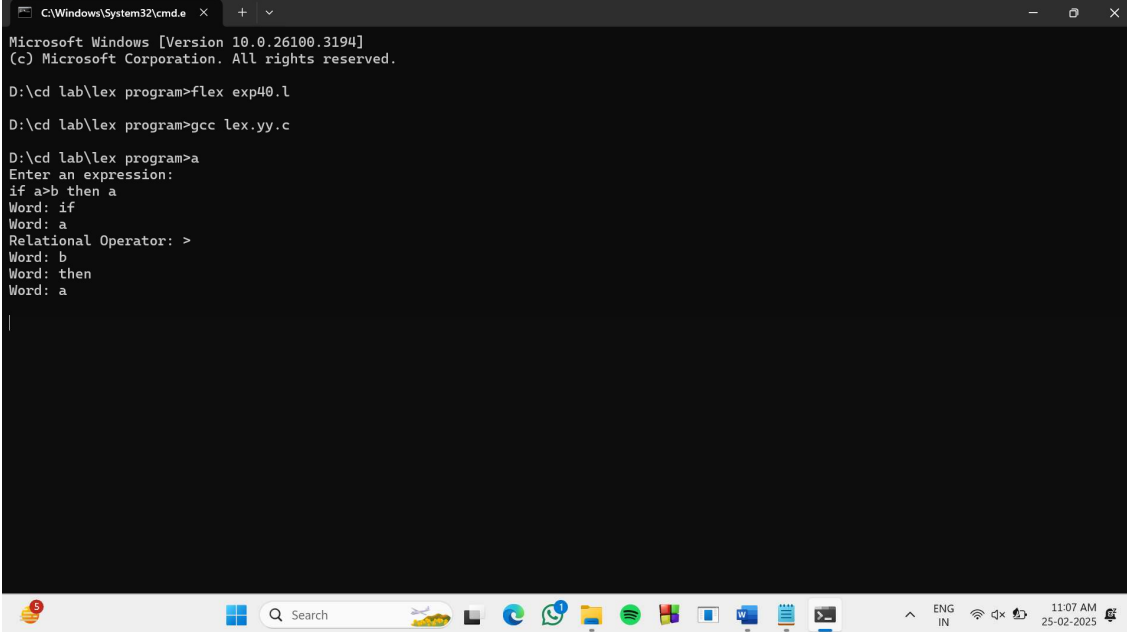
%%

[a-zA-Z]+ { printf("Word: %s\n", yytext); }
[<>]=?|==|!= { printf("Relational Operator: %s\n", yytext); }
.;

%%

int main() {
    printf("Enter an expression:\n");
    yylex();
    return 0;
}
```

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



A screenshot of a Windows command prompt window. The title bar shows 'C:\Windows\System32\cmd.exe'. The window content displays the following commands and output:

```
Microsoft Windows [Version 10.0.26100.3194]  
(c) Microsoft Corporation. All rights reserved.  
  
D:\cd lab\lex program>flex exp40.l  
D:\cd lab\lex program>gcc lex.yy.c  
D:\cd lab\lex program>a  
Enter an expression:  
if a>b then a  
Word: if  
Word: a  
Relational Operator: >  
Word: b  
Word: then  
Word: a  
|
```

The taskbar at the bottom shows the Start button, a search bar, and several application icons including File Explorer, Edge, and various utility programs. The system tray on the right indicates the language is 'ENG IN', shows network and volume icons, and displays the time '11:07 AM' and date '25-02-2025'.