Practical 4

Aim: String validation using Lax tool

Objective-1:

Write a program to identify and extract all numbers from input string and display them one by one in new line.

Input requirement

- Accept a character string, mix of text and numbers, from the user.
- Ensure the input is terminated with a newline character.

Expected output

The program should print out each number found in the input, each on a new line.

Sample input output

Input	Output
a1b22c3	1 22 3

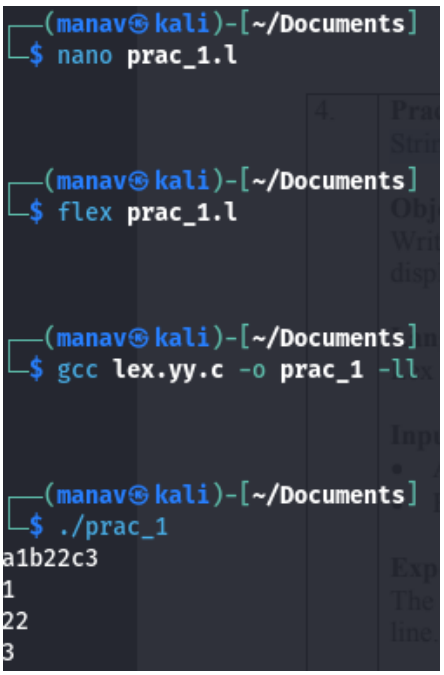
Testcases

power operation -> 12 ** 3 = 1728
You multiply 804569 with 1 then will be :

CODE:

```
 GNU nano 8.1                                    prac_1.l *
%{
#include <stdio.h>
%}

%%
[0-9]+   { printf("%s\n", yytext); }
.        { }  // Ignore non-numeric characters

%%

int main() {
    yylex();
    return 0;
}

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

OUTPUT:



Objective-2:

Write a program to replace the word "charusat" with “university” in the input text.

Input requirement

- Accept a character string from the user where the word "charusat" may appear multiple times.
- Ensure the input is terminated with a newline character.

Expected output

The program should print the input text with all occurrences of "charusat" replaced by “university”.

Sample input output

Input	Output
This is charusat.	This is university.

Testcases

Charusat is in Anand district.	I am doing my BTech from CHARSAT.
Charusat , What is charusat?	Every where it is charusat , charusat and only charusat.

CODE:

```
  GNU nano 8.1                                          prac_1_2.l
%{
#include <stdio.h>
%}

%%
charusat    { printf("university"); }
.           { putchar(yytext[0]); }

%%

int main() {
    yylex();
    return 0;
}

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

OUTPUT:

```
┌──(manav㉿kali)-[~/Documents]
└─$ nano prac_1_2.l

┌──(manav㉿kali)-[~/Documents]
└─$ flex prac_1_2.l

┌──(manav㉿kali)-[~/Documents]
└─$ gcc lex.yy.c -o prac_1_2 -ll

┌──(manav㉿kali)-[~/Documents]
└─$ ./prac_1_2
This is charusat
This is university
charusat is in Anand District.
university is in Anand District.
i am doing my BTECH from CHARUSAT.
i am doing my BTECH from CHARUSAT.
Charusat,What is charusat?
Charusat,What is university?
Every where it is charusat, charusat and only charusat.
Every where it is university, university and only university.
```

Objective-3:

Write a program to count number of characters, word and lines from the input file.

Input requirement

Read contain from a text file containing multiple word and lines.

Expected output

The program should print total number of characters (including spaces), words (separated by white spaces), lines (end with new line symbol).

Sample input output

Input	Output
The 45 is odd number.	Characters : 22 Words : 5 Line : 1

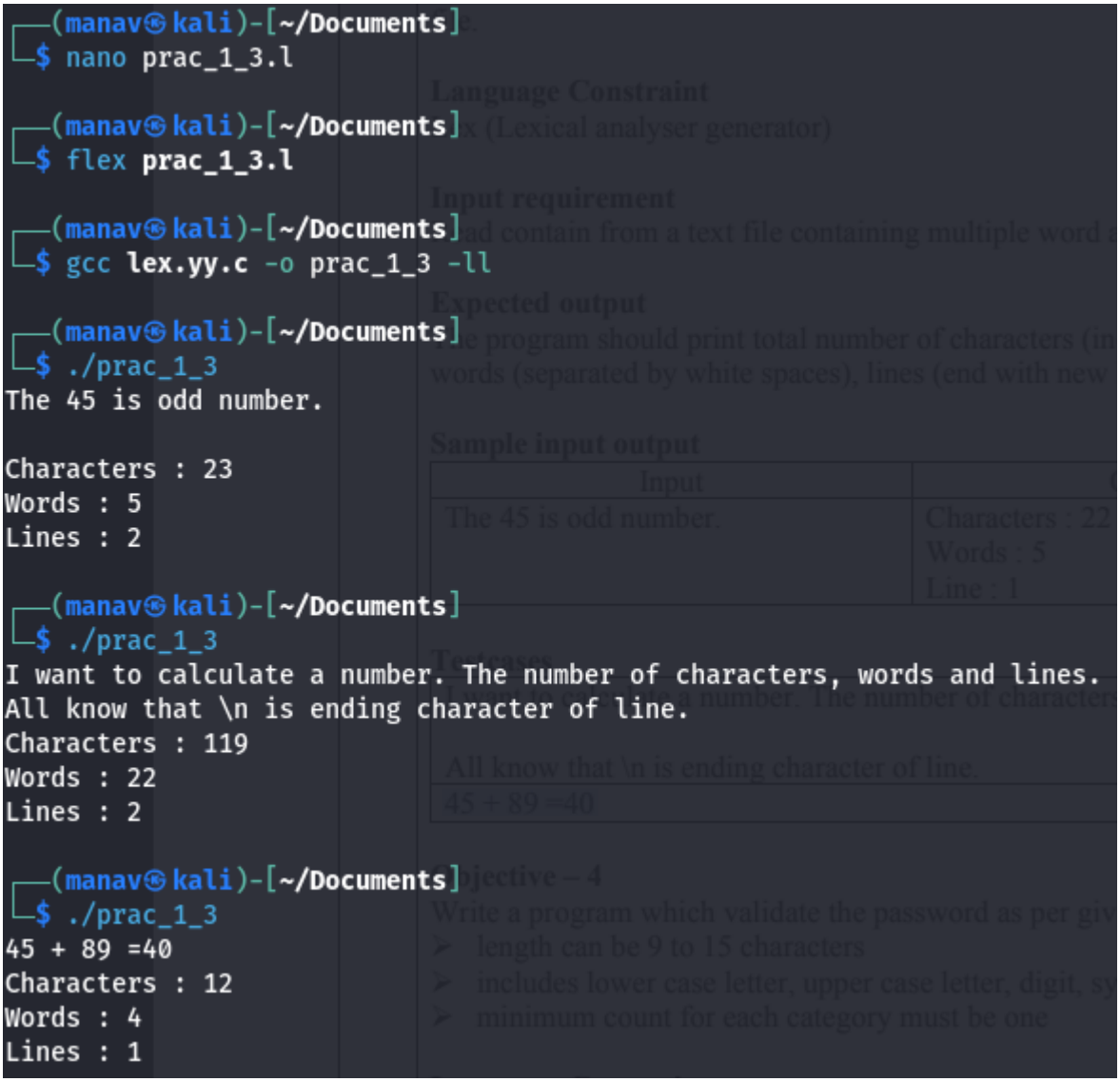
Testcases

I want to calculate a number. The number of characters, words and lines. All know that \n is ending character of line.
45 + 89 =40

CODE:

```
 GNU nano 8.1                                    prac_1_3.l
%{
#include <stdio.h>

int char_count = 0, word_count = 0, line_count = 0;
%}

%%
\n        { line_count++; char_count++; }
[^\n\t ]+ { word_count++; char_count += yyleng; }
.         { char_count++; }

%%

int main() {
    yylex();
    printf("Characters : %d\n", char_count);
    printf("Words : %d\n", word_count);
    printf("Lines : %d\n", line_count);
    return 0;
}

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

OUTPUT:


(manav㉿kali)-[~/Documents]
$ nano prac_1_3.l
(manav㉿kali)-[~/Documents]
$ flex prac_1_3.l
(manav㉿kali)-[~/Documents]
$ gcc lex.yy.c -o prac_1_3 -ll
(manav㉿kali)-[~/Documents]
$ ./prac_1_3
The 45 is odd number.
Characters : 23
Words : 5
Lines : 2
(manav㉿kali)-[~/Documents]
$ ./prac_1_3
I want to calculate a number. The number of characters, words and lines.
All know that \n is ending character of line.
Characters : 119
Words : 22
Lines : 2
(manav㉿kali)-[~/Documents]
$ ./prac_1_3
45 + 89 =40
Characters : 12
Words : 4
Lines : 1

Objective-4:

Write a program which validate the password as per given rules.

➢ length can be 9 to 15 characters

➢ includes lower case letter, upper case letter, digit, symbols (*, ; # $ @)

➢ minimum count for each category must be one

Input requirement

- Accept a character string from the user which is mix of letters, numbers and symbols.
- Ensure the input is terminated with a newline character.

Expected output

- If the password meets the given rules, the program should print "Valid password".
- If the password does not meet the rules, the program should print "Invalid password".

CODE:

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

int has_lower = 0, has_upper = 0, has_digit = 0, has_symbol = 0, length = 0;
%}

%%
[a-z]    { has_lower = 1; length++; }
[A-Z]    { has_upper = 1; length++; }
[0-9]    { has_digit = 1; length++; }
[*;#$@]  { has_symbol = 1; length++; }
.        { length++; }  // Count other valid characters
\n       {
    if (length >= 9 && length <= 15 && has_lower && has_upper && has_digit && has_symbol)
        printf("Valid password\n");
    else
        printf("Invalid password\n");

    has_lower = has_upper = has_digit = has_symbol = length = 0;
}
%%

int main() {
    yylex();
    return 0;
}

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

OUTPUT:

```
┌──(manav㉿kali)-[~/Documents]
└─$ nano prac_1_3.l

┌──(manav㉿kali)-[~/Documents]
└─$ nano prac_1_4.l

┌──(manav㉿kali)-[~/Documents]
└─$ nano prac_1_4.l

┌──(manav㉿kali)-[~/Documents]
└─$ flex prac_1_4.l

┌──(manav㉿kali)-[~/Documents]
└─$ gcc lex.yy.c -o prac_1_4 -ll

┌──(manav㉿kali)-[~/Documents]
└─$ ./prac_1_4
a@1T
Invalid password
aB1@
Invalid password
aaBB11,#cdefg2345
Invalid password
CHARUSAT
Invalid password
Charusat
Invalid password
CHArusat123
Invalid password
Charusat@2024
Valid password
Cspit-2024
Invalid password
Charu$at@20#24
Valid password
charu*sAT;22
Valid password
```