LAB NO: 5 INTRODUCTION TO FLEX

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1. Count the number of vowels and consonants in the given input.

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

int chars = 0;
int vowels = 0;
int consonants = 0;
%}

%%
[aAeEiIoOuU]+ {
   vowels += strlen(yytext);
   chars += strlen(yytext);
}
\n {
   chars++;
}
[a-zA-Z] {
   consonants++;
   chars++;
}
. {
   chars++;
}
%%

int main(int argc, char **argv)
{
   yylex();
   printf("\nCharacters: %d, Vowels: %d, Consonants: %d\n", chars, vowels, consonants);
   return 0;
}

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

```
cd_d2@prg:~/220905260/Lab 5$ flex q1.l
cd_d2@prg:~/220905260/Lab 5$ gcc lex.yy.c -o q1
cd_d2@prg:~/220905260/Lab 5$ ./q1
Hello I am Ketan

Characters: 17, Vowels: 6, Consonants: 7
cd_d2@prg:~/220905260/Lab 5$ █
```

2. Count the number of words, characters, blanks and lines in a given text.

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

int chars = 0;
int words = 0;
int lines = 0;
%}

%%
[a-zA-Z]+ {
    words ++;
    chars += strlen(yytext);
}
\n {
    chars++;
    lines++;
}
. {
    chars++;
}
%%

int main(int argc, char **argv)
{
    printf("Enter text:\n");
    yylex();
    printf("\nCharacters: %d, Words: %d, Lines: %d\n", chars, words, lines);
    return 0;
}

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

```
cd_d2@prg:~/220905260/Lab 5$ flex q2.l
cd_d2@prg:~/220905260/Lab 5$ gcc lex.yy.c -o q2
cd_d2@prg:~/220905260/Lab 5$ ./q2
Enter text:
Hello I am Ketan
Welcome to MIT

Characters: 32, Words: 7, Lines: 2
cd_d2@prg:~/220905260/Lab 5$ 
```

3. Find the number of positive integer, negative integer, positive floating positive number and negative floating point number

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

int pos_int = 0;
int neg_int = 0;
int pos_float = 0;
int neg_float = 0;
%}

%%
[0-9]+ {
    pos_int++;
}
[-][0-9]+ {
    neg_int++;
}
[0-9]+[.][0-9]+ {
    pos_float++;
}
[-][0-9]+[.][0-9]+ {
    neg_float++;
}
\n {
}
. {
}
%%

int main(int argc, char **argv)
{
    printf("Enter text:\n");
    yylex();
    printf("\nPositive Integers: %d, Negative Integers: %d, Positive Floats: %d, Negative Floats: %d\n", pos_int, neg_int, pos_float, neg_float);
    return 0;
}

int yywrap() {
```

```
        return 1;
}
```

```
cd_d2@prg:~/220905260/Lab 5$ flex q3.l
cd_d2@prg:~/220905260/Lab 5$ gcc lex.yy.c -o q3
cd_d2@prg:~/220905260/Lab 5$ ./q3
Enter text:
1232 12.657 -123 12.898 -78678 -8796.8979

Positive Integers: 1, Negative Integers: 2, Positive Floats: 2, Negative Floats: 1
cd_d2@prg:~/220905260/Lab 5$ ▯
```

4. Given a input C file, replace all scanf with READ and printf with WRITE statements also find the number of scanf and printf in the file.

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

int printf_count = 0;
int scanf_count = 0;
%}

%%
"printf" {
    printf_count++;
    fprintf(yyout, "WRITE");
}
"scanf" {
    scanf_count++;
    fprintf(yyout, "READ");
}
\n {
    fprintf(yyout, "\n");
}
. {
    fputc(yytext[0], yyout);
}
%%

int main(int argc, char **argv)
{
    FILE *input_file = fopen(argv[1], "r");
    FILE *output_file = fopen(argv[2], "w");
    yyin = input_file;
    yyout = output_file;
    yylex();
    fclose(input_file);
    fclose(output_file);
    printf("\nPrintf count %d, Scanf count %d\n", printf_count, scanf_count);
    return 0;
}
```

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

```
#include <stdio.h>
int main()
{
    int a,b;
    char c[20];
    printf("abcd\n");
    scanf("%d",&a);
    scanf("%d",&b);
```

```
#include <stdio.h>
int main()
{
    int a,b;
    char c[20];
    WRITE("abcd\n");
    READ("%d",&a);
    READ("%d",&b);
    WRITE("cdef\n");
    READ("%s",c);
}
```

```
cd_d2@prg:~/220905260/Lab 5$ flex q4.l
cd_d2@prg:~/220905260/Lab 5$ gcc lex.yy.c -o q4
cd_d2@prg:~/220905260/Lab 5$ ./q4 s1.c s2.c

Printf count 2, Scanf count 3
cd_d2@prg:~/220905260/Lab 5$
```

5. That changes a number from decimal to hexadecimal notation.

```
%{
#include <stdio.h>
#include <stdlib.h>
int decimal = 0;
%}

%%
[0-9]+ {
    decimal = atoi(yytext);
    printf("Decimal: %d, Hexadecimal: %X\n", decimal, decimal);
}
[ \t\n]+ ;
. {
}
%%

int main()
```

```
{
    printf("Enter decimal numbers:\n");
    yylex();
    return 0;
}

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



```
cd_d2@prg:~/220905260/Lab 5$ flex q5.l
cd_d2@prg:~/220905260/Lab 5$ gcc lex.yy.c -o q5
cd_d2@prg:~/220905260/Lab 5$ ./q5
Enter decimal numbers:
12342 7869 45608926
Decimal: 12342, Hexadecimal: 3036
Decimal: 7869, Hexadecimal: 1EBD
Decimal: 45608926, Hexadecimal: 2B7EFDE
cd_d2@prg:~/220905260/Lab 5$ []
```

6. Convert uppercase characters to lowercase characters of C file excluding the characters present in the comment.

```
%{
#include <stdio.h>
#include <string.h>
#include <ctype.h>
char word;
%}

%%
"//".* {
    fprintf(yyout, "%s", yytext);
}

"/*"([^*]|\*+[^*/])*\*+"/" {
    fprintf(yyout, "%s",  yytext);
}
[A-Z] {
    printf("%s",yytext);
    word=tolower(yytext[0]);
    fputc(word,yyout);
}
\n {
    fprintf(yyout, "\n");
}
. {
    fputc(yytext[0], yyout);
}
%%
```

```c
int main(int argc, char **argv)
{
    FILE *input_file = fopen(argv[1], "r");
    FILE *output_file = fopen(argv[2], "w");
    yyin = input_file;
    yyout = output_file;
    yylex();
    fclose(input_file);
    fclose(output_file);
    printf("\n");
    return 0;
}

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

```
cd_d2@prg:~/220905260/Lab 5$ flex q6.l
cd_d2@prg:~/220905260/Lab 5$ gcc lex.yy.c -o q6
cd_d2@prg:~/220905260/Lab 5$ ./q6 s3.c s4.c
ABABCDABHYGJ
cd_d2@prg:~/220905260/Lab 5$ []
```

```c
#include <stdio.h>
int main()
{
    int A,B;
    char c[20];
    //hello I am KETAN
    printf("aABCDae\n");
    scanf("%d",&A);
    scanf("%d",&B);
    printf("cdHYGJef\n");
    scanf("%s",c);
}
```

```c
#include <stdio.h>
int main()
{
    int a,b;
    char c[20];
    //hello I am KETAN
    printf("aabcdae\n");
    scanf("%d",&a);
    scanf("%d",&b);
    printf("cdhygjef\n");
    scanf("%s",c);
}
```