

Lab-5 INTRODUCTION TO FLEX

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Q) Count the number of vowels and consonants in the given input.

```
%{
int vowels = 0, consonants = 0;
%}

%%
[aeiouAEIOU] { vowels++; }
[a-zA-Z] { consonants++; }
. { }
%%

int yywrap() { return 1; }

int main() {
    char stat[100];

    printf("Enter the string: ");
    scanf("%s", stat);

    yy_scan_string(stat);
    yylex();

    printf("Vowels = %d\n", vowels);
    printf("Consonants = %d\n", consonants);

    return 0;
}
```

Output :

```
CD_A1@CL3-25:~/Desktop/College/Sem6/CD/Lab/Lab5$ flex -o q1.c q1.l
CD_A1@CL3-25:~/Desktop/College/Sem6/CD/Lab/Lab5$ gcc q1.c -o q1
CD_A1@CL3-25:~/Desktop/College/Sem6/CD/Lab/Lab5$ ./q1
Enter the string: aeiouhjklahejik1h462i82
Vowels = 9
Consonants = 8
```

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

```
%{
#include <stdio.h>
int words = 0, chars = 0, blanks = 0, lines = 0;
}%

%%
[a-zA-Z]+      { words++; chars += yyleng; }
[ \t\r\f\v]+   { blanks += yyleng; chars += yyleng; }
\n             { lines++; chars++; }
\"             { return 0; }
.              { chars++; }
%%

int yywrap() { return 1; }

int main() {
    printf("Enter input (you can type multiple lines, end with \"):\\n");
    yylex();

    printf("\\nWords      = %d\\n", words);
    printf("Characters = %d\\n", chars);
    printf("Blanks     = %d\\n", blanks);
    printf("Lines      = %d\\n", lines);

    return 0;
}
```

Output :

```
CD_A1@CL3-25:~/Desktop/College/Sem6/CD/Lab/Lab5$ ./q2
Enter input (you can type multiple lines, end with "):
hellow
world
i am
"

Words      = 4
Characters = 18
Blanks     = 1
Lines      = 3
```

Q) Find the number of positive integer, negative integer, positive floating positive number and negative floating point number

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

int pos_int = 0;
```

```

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

%%
-[0-9]+\.[0-9]+      { neg_float++; }
[0-9]+\.[0-9]+      { pos_float++; }
-[1-9][0-9]*        { neg_int++; }
[1-9][0-9]*         { pos_int++; }
[ \t\n]+            { }
.                   { }
%%

int yywrap() { return 1; }

int main() {
    printf("Enter numbers (Ctrl+D to end):\n");
    yylex();

    printf("Positive Integers      = %d\n", pos_int);
    printf("Negative Integers      = %d\n", neg_int);
    printf("Positive Floating Point = %d\n", pos_float);
    printf("Negative Floating Point = %d\n", neg_float);

    return 0;
}

```

Output :

```

CD_A1@CL3-25:~/Desktop/College/Sem6/CD/Lab/Lab5$ ./q3
Enter numbers (Ctrl+D to end):
1 2 -8 -4 -3.8 9 -9.3 2
Positive Integers      = 4
Negative Integers      = 2
Positive Floating Point = 0
Negative Floating Point = 2

```

Q) 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.

```

%{
int scanf_count = 0;
int printf_count = 0;

FILE *out;
}%

%%

```

```

"scanf"      { fprintf(out, "READ");  scanf_count++; }
"printf"     { fprintf(out, "WRITE"); printf_count++; }
.|\\n        { fprintf(out, "%s", yytext); }
%%

int yywrap() { return 1; }

int main(int argc, char *argv[]) {

    if (argc != 2) {
        printf("Usage: %s <input_file.c>\n", argv[0]);
        return 1;
    }

    yyin = fopen(argv[1], "r");
    if (!yyin) {
        perror("Input file error");
        return 1;
    }

    out = fopen("ans.txt", "w");
    if (!out) {
        perror("Output file error");
        return 1;
    }

    yylex();

    printf("\n\nNumber of scanf  = %d\n", scanf_count);
    printf("Number of printf = %d\n", printf_count);

    fclose(yyin);
    fclose(out);
    return 0;
}

```

Input file :

```

#include <stdio.h>
#include <stdlib.h>
#define PI 44e-5

int ahbs;
char func1(int ch, char* s){
    int c = 0;
    int x = 9;
    return 4;
}

int main(){

    if(PI) printf("Nothing here\n");
}

```

```

        int a = 5;
        char b = 7;
        int v,k;
scanf("%d", &v);
//bcsjhkdvbdskh
/*vhjskdvk
bdsfhgbdf
bdfgbnfgdn*/
printf        ("Demo fi                le\n");
        return 0;
}

```

Output :

```
CD_A1@CL3-25:~/Desktop/College/Sem6/CD/Lab/Lab5$ ./q4 file.c
```

```

Number of scanf  = 1
Number of printf = 2

```

Output file :

```

#include <stdio.h>
#include <stdlib.h>
#define PI 44e-5

int ahbs;
char func1(int ch, char* s){
    int c = 0;
    int x = 9;
    return 4;
}

int main(){

        if(PI) WRITE("Nothing here\n");
        int a = 5;
        char b = 7;
        int v,k;
READ("%d", &v);
//bcsjhkdvbdskh
/*vhjskdvk
bdsfhgbdf
bdfgbnfgdn*/
WRITE        ("Demo fi                le\n");
        return 0;
}

```

Q) That changes a number from decimal to hexadecimal notation.

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

%%
[0-9]+ {
    int n = atoi(yytext);
    printf("0x%X", n);
}

%%

int yywrap() { return 1; }

int main() {
    printf("Enter input (Ctrl+D to end):\n");
    yylex();
    return 0;
}
```

Output :

```
CD_A1@CL3-25:~/Desktop/College/Sem6/CD/Lab/Lab5$ ./q5
Enter input (Ctrl+D to end):
1234
0x4D2
1786
0x6FA
```

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

```
%{
#include <ctype.h>
FILE *out;
%}

%x SINGLE
%x MULTI

%%
"//"      { fprintf(out, "%s", yytext); BEGIN(SINGLE); }
"/*"     { fprintf(out, "%s", yytext); BEGIN(MULTI); }

<SINGLE>\n { fprintf(out, "%s", yytext); BEGIN(INITIAL); }
<SINGLE>.  { fprintf(out, "%s", yytext); }
```

```

<MULTI>"*/"      { fprintf(out, "%s", yytext); BEGIN(INITIAL); }
<MULTI>.|\\n     { fprintf(out, "%s", yytext); }

[A-Z]            { fprintf(out, "%c", tolower(yytext[0])); }
.|\\n            { fprintf(out, "%s", yytext); }
%%

int yywrap() { return 1; }

int main(int argc, char *argv[]) {
    if (argc != 2) return 1;

    yyin = fopen(argv[1], "r");
    if (!yyin) return 1;

    out = fopen("ans.txt", "w");
    if (!out) return 1;

    yylex();

    fclose(yyin);
    fclose(out);
    return 0;
}

```

Input file :

```

#include <stdio.h>
#include <stdlib.h>
#define PI 44e-5

int ahbs;
char func1(int ch, char* s){
    int C = 0;
    int x = 9;
    return 4;
}

int main(){
    if(PI) printf("Nothing here\\n");
    int a = 5;
    char b = 7;
    int v,k;
    scanf("%d", &v);
    //bcsVFEDGBERTbdsjkh
    /*vhjskdvk
    SFGDFHDF
    bdfgbnfgdn*/
    printf("Demo fi          le\\n");
}

```

```
        return 0;  
    }
```

Output :

```
#include <stdio.h>  
#include <stdlib.h>  
#define pi 44e-5  
  
int ahbs;  
char func1(int ch, char* s){  
    int c = 0;  
    int x = 9;  
    return 4;  
}  
  
int main(){  
    if(pi) printf("nothing here\n");  
    int a = 5;  
    char b = 7;  
    int v,k;  
    scanf("%d", &v);  
    //bcsVFEDGBERTbdsjkh  
    /*vhjskdvk  
    SFGDFHDF  
    bdfgbnfgdn*/  
    printf("demo file\n");  
    return 0;  
}
```