LAB 5 – INTRODUCTION TO FLEX

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Q1) Count the number of vowels and consonants in the given input.

i) Code

```
%{
int vowels = 0;
int consonants = 0;
%}
%%
[aeiouAEIOU] {vowels++;}
[a-zA-Z] {consonants++;}
%%
int yywrap(){}
int main(int argc, char **argv)
{
yylex();
printf("Enter the string of vowels and consonants:");
   yylex();
   printf("Number of vowels are:  %d\n", vowels);
   printf("Number of consonants are:  %d\n", consonants);
   return 0;
}
```

ii) Terminal

```
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q1$ flex l5q1.l
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q1$ gcc lex.yy.c -o
l5q1
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q1$ ./l5q1
Hello world

Enter the string of vowels and consonants:Number of vowels are:  3
Number of consonants are:  7
```

Q2) Count the number of words, characters, blanks and lines in a given text.

i) Code

```
%{
int chars = 0;
int words = 0;
int lines = 0;
int blank = 0;
%}
%%
[a-zA-Z]+ { words++; chars += strlen(yytext); }
\n { lines++; }
[ ,/t] {blank++; }
. { chars++; }
%%
int main(int argc, char **argv)
```

```
{
yylex();
printf("Lines: %d Words: %d Characters: %d Blank: %d \n", lines, words, chars, blank); }
int yywrap()
{
return 1;
}
```

ii) Terminal

```
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q2$ flex l5q2.l
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q2$ gcc lex.yy.c -o
l5q2
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q2$ ./l5q2
Hello world
welcome to flex programming
thank you
Lines: 3 Words: 8 Characters: 42 Blank: 5
```

Q3) Find the number of positive integer, negative integer, positive floating positive number and negative floating point number

i) Code

```
%{
int posint = 0;
int negint = 0;
int posfloat = 0;
int negfloat = 0;
%}
%%
^[-][0-9]+ {negint++;}
[0-9]+ {posint++;}
^[-][0-9]+[.][0-9]+ {negfloat++;}
[0-9]+[.][0-9]+ {posfloat++;}
%%
int main(int argc, char **argv)
{
yylex();
printf("Total count of \n Postive Integers: %d\n Negative Integers: %d\n Postive Floating Point
Numbers: %d\n Negative Flaoting Point Numbers: %d\n", posint, negint, posfloat, negfloat);
}
int yywrap()
{
return 1;
}
```

ii) Terminal

```
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q3$ flex l5q3.l
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q3$ gcc lex.yy.c -o
l5q3
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q3$ ./l5q3
5
9.0
```

-63
-25
0
96.3

Total count of
Postive Integers: 2
Negative Integers: 2
Postive Floating Point Numbers: 2
Negative Flaoting Point Numbers: 0

Q4) 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.

i) Code

```
%{
int sf=0,pf=0;
%}

%%
"scanf"{ sf++; fprintf(yyout,"READ");}
"printf" { pf++; fprintf(yyout,"WRITE");}
%%

int main()
{
        yyin=fopen("readfile.c","r");
        yyout=fopen("writefile.c","w");
        yylex();
        printf("Number of scanfs=%d\nNumber of Printf's=%d\n",sf,pf);
   return 0;
}
int yywrap(){ return 1; }
```

ii) Terminal

```
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q4$ flex l5q4.l
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q4$ gcc lex.yy.c -o
l5q4
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q4$ ./l5q4
Number of scanfs=2
Number of Printf's=7
```

iii) readfile.c

```
#include<stdio.h>

int main(){
   printf("abc");
   printf("def");
   printf("xyz");
   int abc;
   scanf("%d", &abc);
   printf("abc");
```

```
    printf("abc");
    float val;
    scanf("%f", &val);
    printf("abc");
    printf("abc");
}
```

iv) writefile.c

```
#include<stdio.h>

int main(){
    WRITE("abc");
    WRITE("def");
    WRITE("xyz");
    int abc;
    READ("%d", &abc);
    WRITE("abc");
    WRITE("abc");
    float val;
    READ("%f", &val);
    WRITE("abc");
    WRITE("abc");
}
```

Q5) That changes a number from decimal to hexadecimal notation.

i) Code

```
%{
    int num, r, digit=0, count, pcount=0, i;
    char a[20];
%}

%%
[0-9]+ { num=atoi(yytext);
        while(num!=0){
            r=num%16;
            digit='0'+r;
            if(digit>'9')
            digit+=7;
            a[count++]=digit;
            num=num/16;
        }
        for(i=count-1;i>=pcount;--i)
                printf("Hex val: %c", a[i]);
                pcount=count;
        }
%%
int main()
{
    yylex();
    return 0;
}
int yywrap(){ return 1; }
```

ii) Terminal

```
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q5$ flex l5q5.l
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q5$ gcc lex.yy.c -o l5q5
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q5$ ./l5q5
12
Hex val: C
10
Hex val: A
63
Hex val: 3Hex val: F
2
Hex val: 2
```

Q6) Convert uppercase characters to lowercase characters of C file excluding the characters present in the comment.

i) Code

```
%{
#include <stdio.h>
#include <ctype.h>
%}
%start COMMENT
%%
"//".*              { printf("%s", yytext); }
"/*"                { BEGIN(COMMENT); printf("%s", yytext); }
<COMMENT>"*/"       { BEGIN(INITIAL); printf("%s", yytext); }
<COMMENT>.          { printf("%s", yytext); }
<COMMENT>\n         { printf("%s", yytext); }

[a-z]               { putchar(yytext[0]); }
[A-Z]               { putchar(tolower(yytext[0])); }
.                   { putchar(yytext[0]); }
%%
int main(int argc, char *argv[]) {
if (argc > 1) {
FILE *file = fopen(argv[1], "r");
if (file) {
yyin = file;
```

```
yylex();
fclose(file);
} else {
perror("Error opening file");
}
} else {
yylex();
}
return 0;
}
int yywrap(){ return 1; }
```

ii) readfile.c

```
/*the is a code to add TWO numbers*/
#include<stdio.h>
int main(){
   int a= 6, b = 8;
   printf("THE SUM IS %d", a + b);
   return 0;
}
```

iii) Terminal

```
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q6$ flex l5q6.l
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q6$ gcc lex.yy.c -o l5q6
CD_LAB_A1@debianpc-02:~/Desktop/220905018/Lab5-ProgramsOnFlex/l5q6$ ./l5q6 readfile.c
/*the is a code to add TWO numbers*/
#include<stdio.h>

int main(){
   int a= 6, b = 8;
   printf("the sum is %d", a + b);
   return 0;
}
```