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Week 5

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

- Code:

```
%{
    #include<stdio.h>
    int vowels = 0;
    int consos = 0;
%}
%%
a|e|i|o|u|A|E|I|O|U {vowels++;}
[a-zA-Z] {consos++;}
[\t\n]+ ;
. ;
%%
int main(){
    printf("Enter a string (Ctrl+D to stop): ");
    yylex();
    printf("Vowels: %d | Consonants = %d\n", vowels, consos);
    return 0;
}
int yywrap(){
    return 1;
}
```

- Output:

```
CD_A1@CL3-14:~/Desktop/230905090/Lab5$ ./vowcons
Enter a string (Ctrl+D to stop): hello world
Vowels: 3 | Consonants = 7
```

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

- Code:

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

```
%}

%%
[a-zA-Z]+ {words++; chars += yyleng;}
\n {chars++; lines++;}
[ \t] {chars++; blanks++;}
. {chars++;}
%%

int main(int argc, char** argv){
    printf("Enter a string: ");
    yylex();
    printf("\nCharacters: %d | Words: %d | Blanks: %d | Lines: %d\n",
chars, words, blanks, lines);
    return 0;
}
int yywrap(){
    return 1;
}
```

- Output:

```
CD_A1@CL3-14:~/Desktop/230905090/Lab5$ ./count
Enter a string: hello world
this is sami from Mars *-*

Characters: 39 | Words: 7 | Blanks: 6 | Lines: 2
```

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

- Code:

```
%{
#include<stdio.h>
    int posi = 0;
    int negi = 0;
    int posf = 0;
    int negf = 0;
%}

%%
[+]?([0-9]+)\.[0-9]+ {posf++;}
[-][0-9]+\.[0-9]+ {negf++;}
[+]?[0-9]+ {posi++;}
[-][0-9]+ {negi++;}
. ;
[ \t\n]+ ;
%%

int main(int argc, char** argv){
```

```
    printf("Enter some numbers: ");
    yylex();
    printf("\n+ve Ints: %d | -ve Ints: %d | +ve Floats: %d | -ve Floats:
%d\n", posi, negi, posf, negf);
    return 0;
}
int yywrap(){
    return 1;
}
```

- Output:

```
CD_A1@CL3-14:~/Desktop/230905090/Lab5$ ./nums
Enter some numbers: 1 56 -43
34567
0
-345.654
54.56
5.
+37.766
+54

+ve Ints: 6 | -ve Ints: 1 | +ve Floats: 2 | -ve Floats: 1
```

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.

- Code:

```
%{
#include<stdio.h>
FILE *fout, *fin;
extern FILE *yyin;
%}

%%
printf {fputs("WRITE", fout);}
scanf {fputs("READ", fout);}
\n {fputs("\n", fout);}
[ \t]+ {fputs(yytext, fout);}
. {fputs(yytext, fout);}
%%

int main(){
    fin = fopen("sample.c", "r");
    fout = fopen("sampleout.c", "w");
    if(!fin || !fout) {
        printf("File error\n");
        return 1;
    }
    yyin = fin;
```

```
    yylex();
    fclose(fin);
    fclose(fout);
    return 0;
}
int yywrap(){
    return 1;
}
```

- Output:

```
CD_A1@CL3-14:~/Desktop/230905090/Lab5$ ./files
CD_A1@CL3-14:~/Desktop/230905090/Lab5$ cat sample.c
#include <stdio.h>

int main()
{
    int a, b, sum;

    printf("Enter first number: ");
    scanf("%d", &a);

    printf("Enter second number: ");
    scanf("%d", &b);

    sum = a + b;

    printf("Sum = %d\n", sum);

    return 0;
}
CD_A1@CL3-14:~/Desktop/230905090/Lab5$ cat sampleout.c
#include <stdio.h>

int main()
{
    int a, b, sum;

    WRITE("Enter first number: ");
    READ("%d", &a);

    WRITE("Enter second number: ");
    READ("%d", &b);

    sum = a + b;

    WRITE("Sum = %d\n", sum);

    return 0;
}
```

5. That changes a number from decimal to hexadecimal notation

- Code:

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

```
%%
[0-9]+ {
    int num = atoi(yytext);
    printf("Hexadecimal representation: %x\n", num);
}
[ \t\n]+ ;
. ;
%%

int main(){
    printf("Enter a decimal number: ");
    yylex();
    return 0;
}
int yywrap(){
    return 1;
}
```

- Output:

```
CD_A1@CL3-14:~/Desktop/230905090/Lab5$ ./hexa
Enter a decimal number: 255
Hexadecimal representation: ff
```

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

- Code:

```
%{
#include<stdio.h>
#include<ctype.h>
FILE *fout, *fin;
extern FILE *yyin;
%}

%%
\/\/.* {fputs(yytext, fout);}
\/\*([^*]|\*[^/])*\*\/ {fputs(yytext, fout);}
[A-Z] {putc(tolower(yytext[0]), fout);}
\n {fputs("\n", fout);}
[ \t]+ {fputs(yytext, fout);}
. {fputs(yytext, fout);}
%%

int main(){
    fin = fopen("samplecom.c", "r");
    fout = fopen("samplecomout.c", "w");
    if(!fin || !fout) {
        printf("File error\n");
```

```
            return 1;
        }
        yyin = fin;
        yylex();
        fclose(fin);
        fclose(fout);
        return 0;
    }
    int yywrap(){
        return 1;
    }
```

- Output:

```
CD_A1@CL3-14:~/Desktop/230905090/Lab5$ ./comms
CD_A1@CL3-14:~/Desktop/230905090/Lab5$ cat samplecom.c
#include <STDIO.H>

/* THIS IS A MULTI-LINE COMMENT
   WITH UPPERCASE LETTERS
   AND symbols like A+B, X*Y
*/

int MAIN()
{
    int A = 10;
    int B = 20;

    // SINGLE LINE COMMENT WITH CAPS
    printf("HELLO WORLD\n");
    printf("SUM = %d\n", A + B);

    /* Another COMMENT
       MixedCase COMMENT
    */

    RETURN 0;
}
CD_A1@CL3-14:~/Desktop/230905090/Lab5$ cat samplecomout.c
#include <stdio.h>

/* THIS IS A MULTI-LINE COMMENT
   WITH UPPERCASE LETTERS
   AND symbols like A+B, X*Y
*/

int main()
{
    int a = 10;
    int b = 20;

    // SINGLE LINE COMMENT WITH CAPS
    printf("hello world\n");
    printf("sum = %d\n", a + b);

    /* Another COMMENT
       MixedCase COMMENT
    */

    return 0;
}
```