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Week Num : 5

LAB 5 : INTRODUCTION TO FLEX

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

Code:

```
%{
#include <stdio.h>
int v = 0, c = 0;
%}

%%
[aeiouAEIOU]   { v++; }
[a-zA-Z]       { c++; }
.|\n           {    }
%%


int main() {
    yylex();
    printf("Vowels = %d\nConsonants = %d\n", v, c);
    return 0;
}

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

Output:

```
cdl-6cse-b2@sce-cl11-15:~/Desktop/230905396/Lab5$ ./Q1
Tushar Pathak Lab 5 Introduction to Flex
Vowels = 12
Consonants = 21
```

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

Code:

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

%%
\n          { lines++; chars++; }
[ \t]+      { blanks += yyleng; chars += yyleng; }
[^ \t\n]+   { words++; chars += yyleng; }
.           { chars++; }
%%

int main() {
    yylex();
    printf("Words = %d\nCharacters = %d\nBlanks = %d\nLines = %d\n",
           words, chars, blanks, lines);
    return 0;
}

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

Output:

```
cdl-6cse-b2@sce-cl11-15:~/Desktop/230905396/Lab5$ ./Q2
Tushar Pathak
Lab 5
Introduction to Flex
Words = 7
Characters = 43
Blanks = 6
Lines = 3
```

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

Code:

```
%{
#include <stdio.h>
int pi = 0, ni = 0, pf = 0, nf = 0;
%}

%%
[+]?[0-9]+\.[0-9]+   { pf++; }
-[0-9]+\.[0-9]+     { nf++; }
[+]?[0-9]+          { pi++; }
-[0-9]+             { ni++; }
.|\n                ;
%%

int main() {
    yylex();
    printf("Positive Integers = %d\nNegative Integers = %d\n", pi, ni);
    printf("Positive Floats = %d\nNegative Floats = %d\n", pf, nf);
    return 0;
}

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

Output:

```
cdl-6cse-b2@sce-cl11-15:~/Desktop/230905396/Lab5$ ./Q3
1+ -3 +1-2
Positive Integers = 2
Negative Integers = 2
Positive Floats = 0
Negative Floats = 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.

Code:

```
%{
#include <stdio.h>
int sc = 0, pr = 0;
FILE *yyin;
%}

%%
scanf      { printf("READ"); sc++; }
printf     { printf("WRITE"); pr++; }
.|\n       { printf("%s", yytext); }
%%

int main() {
    yyin = fopen("input.c", "r");
    if (!yyin) {
        perror("input.c");
        return 1;
    }
    yylex();
    printf("\nScanf count = %d\nPrintf count = %d\n", sc, pr);
    return 0;
}
int yywrap() { return 1; }
```

Input file:

```
#include <stdio.h>

int main() {
    int i;
    char msg[] = "Done";
int d=1;
    for (i = 1; i <= 10; i++) {      // loop
        if (i % 2 == 0 && !d) {           // decision
            printf("%d is Even\n", i);

        } else {
            printf("%d is Odd\n", i);
                d -=1;
        }
    }
  printf("%s",msg);
    return 0;
}
```

Output:

```
cdl-6cse-b2@sce-cl11-15:~/Desktop/230905396/Lab5$ ./Q4
#include <stdio.h>

int main() {
    int i;
    char msg[] = "Done";
int d=1;
    for (i = 1; i <= 10; i++) {       // loop
        if (i % 2 == 0 && !d) {             // decision
            WRITE("%d is Even\n", i);

        } else {
            WRITE("%d is Odd\n", i);
        d -=1;
        }
    }
  WRITE("%s",msg);
    return 0;
}

Scanf count = 0
Printf count = 3
```

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

Code:

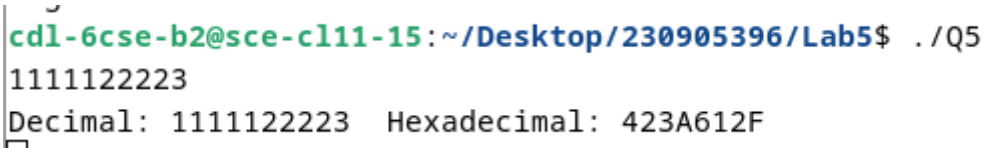
```
%{
#include <stdio.h>
#include <stdlib.h>
%}

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

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

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

Output:



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

Code:

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

FILE *yyin;
%}

%%
"/*"([^*]|\*+[^*/])*\*+"/"   { printf("%s", yytext); }   /* multi-line comment */
"//".*                       { printf("%s", yytext); }   /* single-line comment */
[A-Z]                        { putchar(tolower(yytext[0])); }
.|\n                         { printf("%s", yytext); }
%%

int main() {
   yyin = fopen("input.c", "r");
   if (!yyin) {
      perror("input.c");
      return 1;
   }
   yylex();
   return 0;
}

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

Input file:

```
#INCLUDE <STDIO.H>
INT MAIN() {
   INT I;
   CHAR MSG[] = "DONE";
INT D=1;
   FOR (I = 1; I <= 10; I++) {      // LOOP
      IF (I % 2 == 0 && !D) {           // DECISION
         PRINTF("%D IS EVEN\n", I);
      } ELSE {
         PRINTF("%D IS ODD\n", I);
            D -=1;
      }
   }
  PRINTF("%S",MSG);
   RETURN 0;
}
```

Output:

```
cdl-6cse-b2@sce-cl11-15:~/Desktop/230905396/Lab5$ ./Q6
#include <stdio.h>

int main() {
    int i;
    char msg[] = "done";
int d=1;
    for (i = 1; i <= 10; i++) {      // LOOP
        if (i % 2 == 0 && !d) {             // DECISION
            printf("%d is even\n", i);

        } else {
            printf("%d is odd\n", i);
        d -=1;
        }
    }
  printf("%s",msg);
    return 0;
}
```