System Software

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Lab Assignment 4

1)

```
%{
#include <stdio.h>
int lineCount = 0, charCount = 0, wordCount = 0;
%}
%%
[^ \t\n]+ wordCount++; charCount += yyleng;
\n lineCount++; charCount++;
%%
int main() {
yylex();
printf("line count = %d, word count = %d and char count = %d\n",lineCount, wordCount,
charCount);
}
```

jhajharia@Nehals-MacBook-Air Asmt4 % ./a.out
nehal
jhajharia
line count = 2, word count = 2 and char count = 16
jhajharia@Nehals-MacBook-Air Asmt4 %

2)

```
%{
#include <stdio.h>
int vowels = 0, consonants = 0;
%}
%%
[aeiou] vowels++;
```

```
[bcdfghjklmnpqrstvwxyz] consonants++;
%%
int main() {
yylex();
printf("vowel count = %d, consonant count = %d\n", vowels, consonants);
}
```

jhajharia@Nehals-MacBook-Air Asmt4 % ./a.out
nehaljhajharia

vowel count = 6, consonant count = 8
jhajharia@Nehals-MacBook-Air Asmt4 %

3)

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

%%
[a-z] printf("%c",yytext[0] - ('a' - 'A'));
0 { return 0;}
%%
int yywrap(void)
{
return 1;
}
int main()
{
 FILE *fp;
 fp = fopen("email.txt", "r");
 if (fp == NULL) { printf("File not found"); }
 yyin = fp;

 yylex();
 return 0;
}
```

jhajharia@Nehals-MacBook-Air Asmt4 % ./a.out
NEHALJHAJAHRIA@GMAIL.COM%
jhajharia@Nehals-MacBook-Air Asmt4 %

4)

```
%{
#include <stdio.h>
int posInt = 0, negInt = 0, posFrac = 0, negFrac = 0;
%}
%%
[0-9]+ posInt++;
[-][0-9]+ negInt++;
[0-9]*\.[0-9]* posFrac++;
[-][0-9]*\.[0-9]* negFrac++;
%%
int main() {
yylex();
printf("Positive integers count = %d, Negative integers count = %d\n Positive
fractions count = %d, Negative fractions count = %d\n", posInt, negInt, posFrac,
negFrac);
}
```

jhajharia@Nehals-MacBook-Air Asmt4 % ./a.out
16 -14 20

12.4 -13.2

Positive integers count = 2, Negative integers count = 1
 Positive fractions count = 1, Negative fractions count = 1
jhajharia@Nehals-MacBook-Air Asmt4 %

5)

```
%{
#include<stdio.h>
%}
%%
"+91"[0-9]+ {
```

```
    if(yyleng == 13)
    printf("Is a valid phone number.\n");
    }
[a-zA-Z0-9.]+\@[a-z]+[.][a-z.]+ {
    printf("Is a valid email address.\n");
}
[a-zA-Z0-9.]+ printf("Not a valid phone number or email address.\n");
%%
int main() {
yylex();
}
```

jhajharia@Nehals-MacBook-Air Asmt4 % ./a.out
nehaljhajharia@gmail.com
Is a valid email address.

8529311508
Not a valid phone number or email address.

+918529311508
Is a valid phone number.

jhajharia@Nehals-MacBook-Air Asmt4 %

6)
```
%{
#include<stdio.h>
char op = ' ';
int a, b;
void cal();
%}
%%
[0-9]+ {cal();}
"+" op='+';
"-" op='-';
"*" op='*';
"/" op='/';
%%
```

```c
void cal() {
if( op == ' ' ) {
a = atoi(yytext);
} else {
b = atoi(yytext);
switch(op) {
case '+':
printf("%d + %d = %d\n", a, b, a+b); break;
case '-':
printf("%d - %d = %d\n", a, b, a-b); break;
case '*':
printf("%d * %d = %d\n", a, b, a*b); break;
case '/':
printf("%d / %d = %d\n", a, b, a/b); break;
default:
printf("Invalid input.\n");
break;
}
op = ' ';
}
}
int main() {
yylex();
}
```

jhajharia@Nehals-MacBook-Air Asmt4 % ./a.out
16+14
16 + 14 = 30

16-14
16 - 14 = 2

16 * 14
  16 * 14 = 224

16/14
16 / 14 = 1

jhajharia@Nehals-MacBook-Air Asmt4 %

7)

```
%{
#include <stdio.h>
int flag = 0;
%}
%%
" and "|" or "|" but " flag = 1;
%%
int main() {
yylex();
if(flag == 1) {
printf("Compound sentence.\n");
} else {
printf("Simple sentence.\n");
}
}
```

jhajharia@Nehals-MacBook-Air Asmt4 % ./a.out

My name is Nehal Jhajharia.

My name is Nehal Jhajharia.

Simple sentence.

jhajharia@Nehals-MacBook-Air Asmt4 % ./a.out

My first name is Nehal and last name is Jhajharia.

My first name is Nehallast name is Jhajharia.

Compound sentence.

jhajharia@Nehals-MacBook-Air Asmt4 %