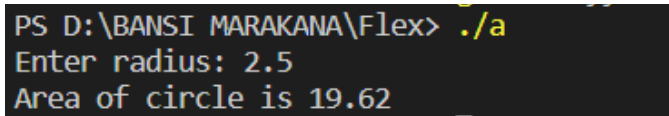


**Department of Computer Science and Engineering SVNIT, Surat**  
**Tutorial 2**

**U20CS005**  
**BANSI MARAKANA**

**1. Write a Lex program to compute the area of a circle.**

```
%{
float pi=3.14, area, radius;
int flag=0;
%}
%%
[-+]?[0-9]+|([-+]?[0-9]*)"([0-9]+) {radius=atof(yytext); area=pi*radius*radius;}
.+ {flag++;}
\n {return 0;}
%%
int main()
{
    printf("Enter radius: ");
    yylex();
    if(!flag)
        printf("Area of circle is %.2f", area);
    else
        printf("Enter valid input!!");
    return 0;
}
int yywrap()
{
    return 1;
}
```



```
PS D:\BANSI MARAKANA\Flex> ./a
Enter radius: 2.5
Area of circle is 19.62
```

**2. Write a Lex program to calculate the simple interest.**

```
%{
#include <stdio.h>
int flag = 0;
float principal, rate, time, interest;
%}
dig [0-9]+|([0-9]*)"([0-9]+)
%%
{dig} {simple();}
\n {return 0;}
%%
```

```

int simple()
{
    switch(flag)
    {
        case 0:
        {
            principal = atof(yytext);
            break;
        }
        case 1:
        {
            rate = atof(yytext);
            break;
        }
        case 2:
        {
            time = atof(yytext);
            break;
        }
    }
    flag++;
    return 0;
}

int yywrap()
{
    return 1;
}

int main()
{
    printf("Enter the principal amount : ");
    yylex();
    printf("Enter the rate : ");
    yylex();
    printf("Enter the time duration (in years) : ");
    yylex();
    printf("Simple interest is %.2f.\n", (principal*rate*time)/100);
    return 0;
}

```

```

PS D:\BANSI MARAKANA\Flex> ./a
Enter the principal amount : 2000
Enter the rate : 3
Enter the time duration (in years) : 12
Simple interest is 720.00.

```

### 3. Write a Lex program that converts Fahrenheit to Celsius.

```
%{
float fahrenheit, celsius;
int flag=0;
%}
%%
[-+]?[0-9]+|([-+]?([0-9]*))"([0-9]+) {conv();}
.+ {flag++;}
\n {return 0;}
%%
int conv()
{
    celsius=atof(yytext);
    fahrenheit=32+celsius*9/5;
    return 0;
}
int main()
{
    printf("Enter temperature in celsius: ");
    yylex();
    if(!flag)
        printf("Temperature in Fahrenheit is %.2f", fahrenheit);
    else
        printf("Enter valid input!!");
    return 0;
}
int yywrap()
{
    return 1;
}
```

```
PS D:\BANSI MARAKANA\Flex> ./a
Enter temperature in celsius: 37
Temperature in Fahrenheit is 98.60
```

### 4. Write a Lex program to swap two numbers with and without using a temporary variable.

```
%{
    int a,b,flag=0;
%}
%%
[-+]?[0-9]+ {swapping();}
\n {return 0;}
%%
```

```

int swapping()
{
    if(flag)
    {
        b=atof(yytext);
        with_temp();
        without_temp();
    }
    else
    {
        a=atof(yytext);
        flag++;
    }
    return 0;
}
int with_temp()
{
    printf("\nUsing temporary variable:\n");
    int temp;
    printf("\tValue of a is %d and b is %d before swapping.\n",a,b);
    temp=b;
    b=a;
    a=temp;
    printf("\tValue of a is %d and b is %d after swapping.\n",a,b);
    return 0;
}
int without_temp()
{
    printf("\nWithout using temporary variable:\n");
    printf("\tValue of a is %d and b is %d before swapping.\n",a,b);
    a=a+b;
    b=a-b;
    a=a-b;
    printf("\tValue of a is %d and b is %d after swapping.\n",a,b);
    return 0;
}
int yywrap()
{
    return 1;
}
int main()
{
    printf("Enter first number : ");
    yylex();
}

```

```

printf("Enter second number : ");
yylex();
return 0;
}

```

```

PS D:\BANSI MARAKANA\Flex> ./a
Enter first number : -3
Enter second number : 5

Using temporary variable:
    Value of a is -3 and b is 5 before swapping.
    Value of a is 5 and b is -3 after swapping.

Without using temporary variable:
    Value of a is 5 and b is -3 before swapping.
    Value of a is -3 and b is 5 after swapping.

```

**5. Write a Lex program that reads two numbers and performs their division. If the division is not possible, then an error message, "Division not possible" is displayed.**

```

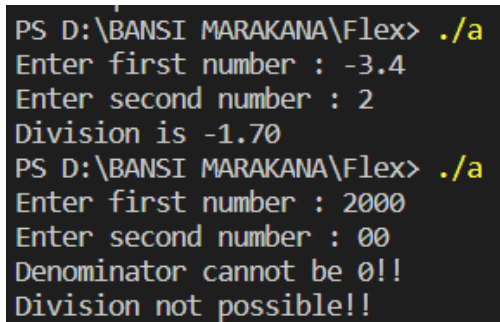
%{
    float a,b;
    int flag=0;
}%
%%
[-+]?[0-9]+|([-+])?([0-9]*)".([0-9]+) {division();}
\n {return 0;}
%%
int division()
{
    if(flag)
    {
        b=atof(yytext);
        if(b==0)
            printf("Denominator cannot be 0!! \nDivision not possible!!\n");
        else
            printf("Division is %0.2f",a/b);
    }
    else
    {
        a=atof(yytext);
        flag++;
    }
    return 0;
}

```

```

int yywrap()
{
    return 1;
}
int main()
{
    printf("Enter first number : ");
    yylex();
    printf("Enter second number : ");
    yylex();
    return 0;
}

```



```

PS D:\BANSI MARAKANA\Flex> ./a
Enter first number : -3.4
Enter second number : 2
Division is -1.70
PS D:\BANSI MARAKANA\Flex> ./a
Enter first number : 2000
Enter second number : 00
Denominator cannot be 0!!
Division not possible!!

```

**6. Write a Lex program to recognize valid arithmetic expressions and identify the identifiers and operators.**

```

%{
#include<string.h>
#include<stdio.h>
int flag = 0, i = 0, j, k = 0;
char operands[50][50], operators[50][50];
}%
%%
[A-Za-z0-9]+ {flag++; strcpy(operands[i],yytext); i++;}
[-+*/] {flag--; strcpy(operators[k],yytext); k++;}
\n {return 0;}
%%
int main()
{
    printf("Enter arithmetic expression: ");
    yylex();
    if(flag!=1)
        printf("Invalid expression!!\n");
    else
    {
        printf("Valid expression!!\n");
        printf("\tIdentifiers are : ");
    }
}

```

```

        for(j=0;j<i;j++)
            printf("%s ",operands[j]);
        printf("\n\tOperators are : ");
        for(j = 0;j < k; j++)
            printf("%s ",operators[j]);
        printf("\n");
    }
    return 0;
}
int yywrap()
{
    return 1;
}

```

```

PS D:\BANSI MARAKANA\Flex> ./a
Enter arithmetic expression: a*b+c-d/5
Valid expression!!
    Identifiers are : a b c d 5
    Operators are : * + - /

```

## 7. Write a Lex program to count the Positive numbers, Negative numbers and Fractions.

```

%{
int positivenumber=0, negativenumber=0, positivefraction=0, negativefraction=0;
%}
%%
[+]?[0-9]+ {positivenumber++;printf("This is a positive integer \n");}
[-]?[0-9]+ {negativenumber++;printf("This is a negative number \n");}
[+]?[0-9]*\.[0-9]+ {positivefraction++;printf("This is a positive fraction \n");}
[-]?[0-9]*\.[0-9]+ {negativefraction++;printf("This is a negative fraction \n");}
\n\n {return 0;}
%%
int main()
{
    printf("Enter numbers: ");
    yylex();
    printf("\nNumber of positive numbers: %d", positivenumber);
    printf("\nNumber of Negative numbers: %d", negativenumber);
    printf("\nNumber of Positive numbers in fractions: %d", positivefraction);
    printf("\nNumber of Negative numbers in fractions: %d\n", negativefraction);
    return 0;
}
int yywrap()
{
    return 1;
}

```

```

PS D:\BANSI MARAKANA\Flex> ./a
Enter numbers: 90
This is a positive integer
-9

This is a negative number
8.97

This is a positive fraction
-9.087

This is a negative fraction

Number of positive numbers: 1
Number of Negative numbers: 1
Number of Positive numbers in fractions: 1
Number of Negative numbers in fractions: 1

```

### 8. Write a Lex program to count the number of words.

```

%{
int word_count = 0;
%}
%%
[^\t\n]+ {word_count++;}
\n\n {return 0;}
%%
int main()
{
    char fname[20];
    printf("Enter text to count word: ");
    yylex();
    printf("Number of words: %d\n",word_count);
    return 0;
}
int yywrap()
{
    return 1;
}

```

```

PS D:\BANSI MARAKANA\Flex> ./a
Enter text to count word: Hello World
I am Learning System Software

Number of words: 7

```