# Assignment 7: User defined functions

You should read following topics before starting this exercise

1. Declaring and Defining a function
2. Function call
3. Passing parameters to a function
4. Function returning a value

You have already used standard library functions. C allows to write and use user defined functions. Every program has a function named main. In main you can call some functions which in turn can call other functions.

The following table gives the syntax required to write and use functions

| Sr. No | Actions involving Functions | Syntax | Example |
|---|---|---|---|
| 1. | Function declaration | Return type function(type arg1, type arg2 … ); | void display();<br>int sum(int x, int y); |
| 2. | Function definition | Return type function(type arg1, type arg2 … )<br>{<br>/* statements*/<br>} | float calcarea (float r)<br>{<br>float area = Pi *r*r ;<br>return area;<br>} |
| 3. | Function call | function(arguments);<br>variable = function(arguments); | display();<br>ans = calcarea(radius); |

## 1. Sample code

The program given below calculates the area of a circle using a function and uses this function to calculate the area of a cylinder using another function.

```
/* Program to calculate area of circle and cylinder using function */

 #include <stdio.h>
 void main()
 {
     float areacircle (float r);
      float areacylinder(float r, int h);
     float area, r;
     printf("\n Enter Radius: ");
     scanf("%f",&r);

     area=areacircle(r);
     printf("\n Area of circle =%6.2f", area);

     printf("\n Enter Height: ");
```

```
        scanf("%d",&h);
        area=areacylinder(r,h);
        printf("\n Area of cylinder =%6.2f", area);
    }

    float areacircle (float r)
    {
        const float pi=3.142;
        return(pi * r*r );
    }
    float areacylinder (float r, int h)
    {
        return 2*areacircle(r)*h;
    }
```

2. **Sample code**

The function iswhitespace returns 1 if its character parameter is a space, tab or newline character. The program accepts characters till the user enters EOF and counts the number of whitespaces.

```
/* Program to count whitespaces using function */

#include <stdio.h>
void main()
{
    int iswhitespace (char ch);
    char ch;
    int count=0;

    printf("\n Enter the characters. Type CTRL +Z to terminate: ");
    while((ch=getchar())!=EOF)
        if(iswhitespace(ch))
            count++;
    printf("\n The total number of white spaces =%d", count);
}
int iswhitespace (char ch)
{
    switch(ch)
    {
      case ' ':
      case '\t' :
      case '\n' : return 1;
      default : return 0;
    }
}
```

## Set A. Write C programs for the following problems

1. Write a function is Even, which accepts an integer as parameter and returns 1 if the number is even, and 0 otherwise. Use this function in main to accept n numbers and check if they are even or odd.

2. Write a function, which accepts a character and integer n as parameter and displays the next n characters.

3. Write a function, which accepts a character and integer n as parameter and displays the next n characters.

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**Set B. Write C programs for the following problems**

1. Write a function is Prime, which accepts an integer as parameter and returns1 if the number is prime and 0 otherwise. Use this function in main to display the first 10 prime numbers.

2. Write a function that accepts a character as parameter and returns 1 if it is an alphabet, 2 if it is a digit and 3 if it is a special symbol. In main, accept characters till the user enters EOF and use the function to count the total number of alphabets, digits and special symbols entered.

3. Write a function my_palindrome (int x) that will return 1 or 0 depending on given number is palindrome or not. Use this function in main () to check 'n' numbers.

4. Write a function swap () that will interchange the values of given two integers. Print the values before and after swap () call in main.

5. Write a function dis_word () which accept single digit number and display it in words. If number is not valid range then display "Out of Bounds".

6. Write a function welcome (int) to which hour's value is passed as parameter. The function should display message "Good Morning" , "Good Afternoon" , "Good Evening" , "Good Night" depending on given hours value.

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**Assignment Evaluation**

0: Not done □ 2: Late Complete □ 4: Complete □

1: Incomplete □ 3: Needs improvement □ 5: Well Done □

**Signature**