SINDH MADRESSATUL ISLAM UNIVERISTY, KARACHI

DEPARTMENT OF SOFTWARE ENGINEERING

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CSC103 - PROGRAMMING FUNDAMENTALS

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SECTION SE1A/SE1B/SE1C/CS1D[e]

LAB MANUAL 12

FUNCTIONS IN C

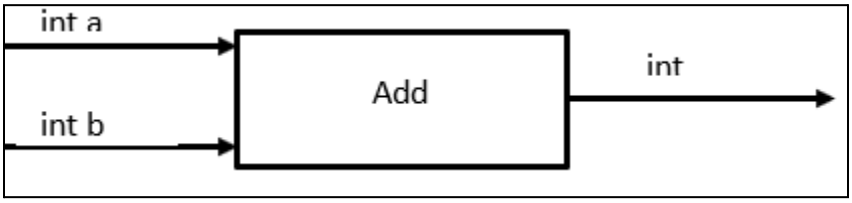
FUNCTIONS IN C

1. Functions:

- Consider the following program:

```
#include <stdio.h>

int main()
{
        int a=0, b=0, sum;

        printf("Enter value of a:\t");
        scanf("%d", &a);
        printf("Enter value of b:\t");
        scanf("%d", &b);

        sum = add(a,b);

        printf("%d", sum);

        return 0;
}
```

- The odd expression ***sum = add(a,b);*** is called a function calling or the execution of a sub-process of the whole program.



- A function in C language is a block of code that performs a specific task. It has a name and is reusable i.e. it can be executed from as many different parts in a C

Program as required. A function in a C program has some properties discussed below:

- Every function has a unique name. This name is used to call functions from "main()" or any other function.
- A function is independent and it can perform its task without intervention from or interfering with other parts of the program.
- A function performs a specific task. A task is a distinct job that your program must perform as part of its overall operation, such as adding two or more integers, sorting an array into numerical order, or calculating cube of a number, etc.
- A function returns a value to the calling program. This is optional and depends upon the task your function is going to accomplish.
- Suppose you just want to print some lines through the function then it is not necessary to return a value.
- But if you are calculating the area of a rectangle, for instance, and want to use the result somewhere in the program, then you have to send back (return) the value to the calling function.

2. Function Prototype/Declaration:

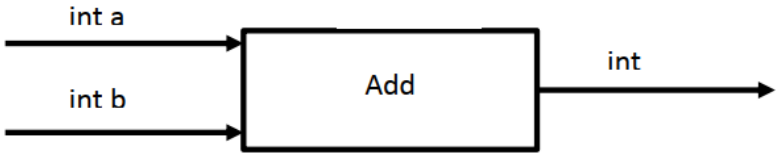
- Function prototype or function declaration refers to informing the compiler the signature (the name, return type and parameter details) of a function that will be defined and called later.
- A function declaration must be done ONCE only and is generally placed before defining the main() function.
- If a function will not return anything the return data type will be void otherwise any data type required.

- A general form of a C function declaration is as follows:

```
returnType functionName (dataType parameter1Name , … , dataType parameterNName);
```

E.g:

int add (**int** a, **int** b);



3. Function Definition:

- Function definition refers to the implementation of the "declared" function. The signature will obviously be the same as stated in the function declaration.
- A general form of a C function definition is as follows:

```
returnType functionName (dataType parameter1Name , … , dataType parameterNName); //Prototype

returnType functionName (dataType parameter1Name , … , dataType parameterNName) {
statement 1;
statement 2;
statement 3;
…
statement x;
return returnValue;
}
```

Example 01:

```
#include <stdio.h>

int add(int a, int b);  //Function Declaration/Prototype
int main()
{
        float a=0, b=0, sum;
        printf("Enter value of a:\t");
        scanf("%d", &a);
        printf("Enter value of b:\t");
        scanf("%d", &b);
        sum = add(a,b); //Function Calling AND Catching Return Value in sum
        printf("%d", sum);
        return 0;
}
int add(int a, int b)   //Function Definition
{
        float c;
        c = a+b;
        return c;
}
```

Example 02:

```
#include <stdio.h>

float average(float x, float y);//Function Declaration/Prototype
int main()
{
        float x=0, y=0, avg;
        printf("Enter value of x:\t");
        scanf("%f", &x);
        printf("Enter value of y:\t");
        scanf("%f", &y);
        avg = average(x,y);     //Function Calling AND Catching Return Value in avg
        printf("%f", avg);
        return 0;
}
float average(float x, float y) //Function Definition
{
        float c;
        c = (a+b)/2;
        return c;
}
```

Task 01:

Write a function to Take temperature in Centigrade as input and convert it into Kelvin i.e. K = C + 273

Task 02:

Write a function named "msd" to calculate the most significant digit (left-most) of a 3-digit number.

Lab Task 12:

Using functions, write C programs for the following problems:

1. **Calculate the sum of both digits of a user entered two digit number.**
2. **For a student of CSC103, take his Quiz #1 marks (out of 15) as input and convert it into percentage marks.**
3. **Take temperature in Fahrenheit as input and convert it into Centigrade i.e. C = 5*(F-32)/9**
4. **Input current and resistance from user and write a function to calculate voltage. V=IR .**

Submission Instructions:

Due Date: Jan 08, 2023

1. **For C files, name your C files as questionNumber_yourRollNum_yourSection_LTNumber.c (e.g. Q1_BSE-22F-123_SE1A_LT1.c).**
2. **Place all files in a folder and name the folder as yourRollNum_yourSection_LTNumber (e.g. BSE-22F-123_SE1A_LT1).**
3. **Compress the folder by using either Winrar or 7Zip with the same name.**
4. **Go to tiny.cc/pffall2022smiu and in the "Coordination Document Folder" open the "PF-Activity Submission Form".**
5. **Fill out all the details with your correct password and submit the form by the due date.**