Functions

It is a block of code which take input from user then processes it and gives output of the corresponding input. It is a way to perform some task. It is a collection of instructions that performs a specific task. It provides the reusability of code.

Properties

- Execution always starts from main Properties
- A function gets called directly or indirectly from main
- There can be multiple functions in a program
- Function can only return one value at a time
- Changes to parameters in function don't change the values in calling function.

1. Function Prototype

   ```
   void run();
   ```

2. Function Definition

   ```
   void run() {
           printf("Hello World");
   }
   ```

3. Function Call

   ```
   int main() {
           void run();
           return 0;
    }
   ```

Types

- Library-functions – Inbuilt in C
  scanf( ), printf( ), ... etc

- User-defined functions – Defined & declared by developer

Function Return Type

Function return type tells what type of value is returned after all function is executed. When we don't want to return a value, we can use the void data type.

Values can be passed to functions as a parameter. Parameters act as variables inside the function.

Parameters are specified after the function name, inside the parentheses. We can add as many parameters as we want.

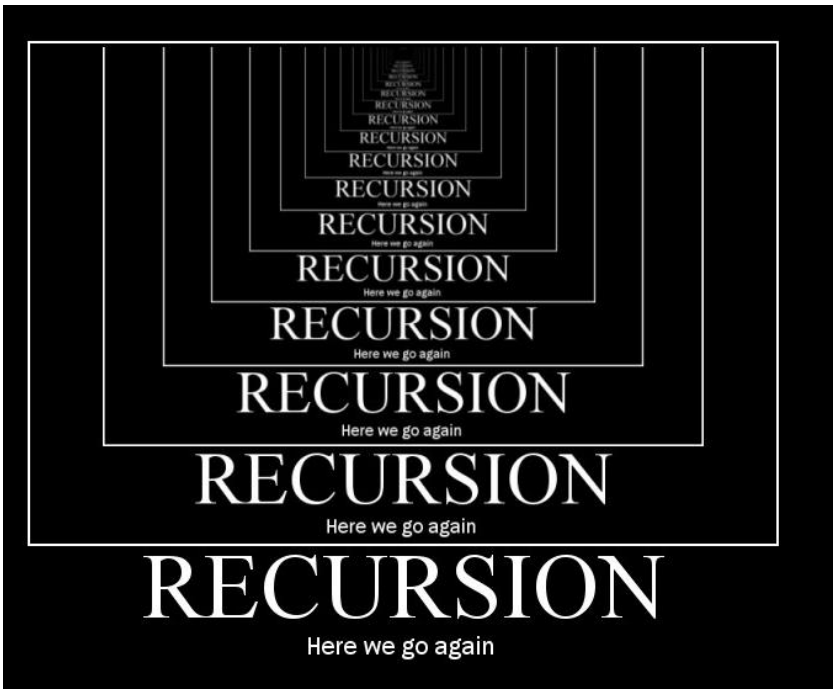
Parameters and Arguments

```
return type functionName(parameter1, parameter2, parameter3) {
        //do something
}
```

Argument	Parameter
The values that are declared within a function when the function is called are known as an argument	The variables that are defined when the function is declared are known as parameters.
These are used in function call statements to send value from the calling function to the receiving function.	These are used in the function header of the called function to receive the value from the arguments.
During the time of call each argument is always assigned to the parameter in the function definition.	Parameters are local variables which are assigned values of the arguments when the function is called.
They are also known as Actual Parameters.	They are also known as Formal Parameters.

Recursion

When a function calls itself then the function is called recursive function, and this technique is known as recursion.



Properties

- **Anything that can be done with Iteration, can be done with recursion and vice-versa.**
- **Recursion can sometimes give the most simple solution.**
- **Base Case is the condition which stops recursion.**
- **Iteration has infinite loop & Recursion has stack overflow**