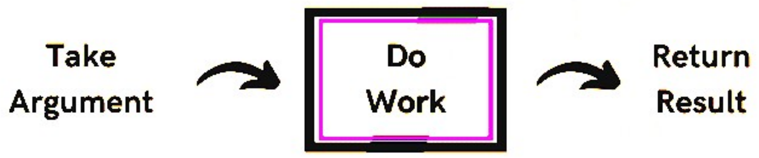
Functions

↓

block of code that performs particular task



it can be used multiple times

increase code reusability

Syntax 1

Function Prototype

```
void printHello( );  ←
```

> Tell the compiler

Syntax 2

Function Definition

```
void printHello() {
    printf("Hello");    ←
}
```

> Do the Work

Syntax 3

Function Call

```
int main() {
     printHello( );     ⟵
     return 0;
}
```

> Use the Work

Properties

- Execution always starts from main

- A function gets called directly or indirectly from main

- There can be multiple functions in a program

Function Types

$$\begin{tikzcd}
& \text{Function Types} \arrow[dl] \arrow[dr] & \\
\text{Library function} & & \text{User-defined}
\end{tikzcd}$$

Library function

Special functions inbuilt in C

scanf( ), printf( )

User-defined

declared & defined by programmer

Passing Arguments

functions can take value & give some value

↙ parameter ↘ return value

Passing Arguments

```
void printHello( );        ←

void printTable(int n);    ←

int sum(int a, int b);     ←
```

Passing Arguments

functions can take value & give some value

↙ parameter ↘ return value

Argument v/s Parameter

values that are passed in function call	values in function declaration & definition
used to send value	used to receive value
actual parameter	formal parameters

NOTE

a. Function can only return one value at a time

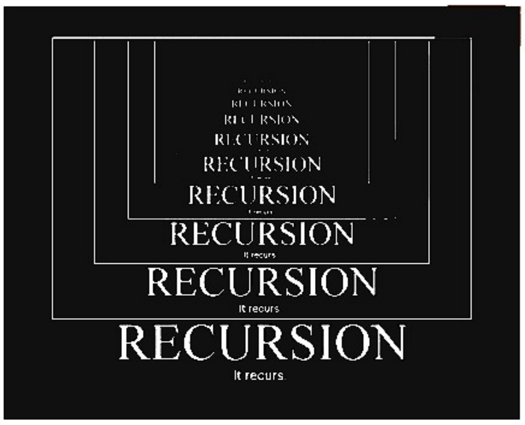
b. Changes to parameters in function don't change the values in calling function.

Because a copy of argument is passed to the function

Recursion

↓

When a function calls itself, it's called recursion



Properties of Recursion

a. Anything that can be done with Iteration, can be done with recursion and vice-versa.

b. Recursion can sometimes give the most simple solution.

c. Base Case is the condition which stops recursion.

d. Iteration has infinite loop & Recursion has stack overflow