

# L6 Functions

For Discord email - [support@learnyard.com](mailto:support@learnyard.com)

# What are Functions ?

public   static   void   main   (String arg [])

↗ return type   ↗ function name

{

↓

Access specifier

↳ static

↳ non-static

}

data type  
return type

a, b  
integer

public static int sum (int a, int b)

{  
 int answer = a + b;  
 return answer;  
}

input

void → logic → Print

```
public class Main
```

```
{
```

```
    public static int sum (int x, int y)
```

```
    {
```

```
        return x+y;
```

```
    }
```

↓  
5

↓  
6

Execution →

```
public static void main (String arg[]) ✓
```

```
{
```

```
    int a = 5; int b = 6; ✓
```

```
    S.O. Ptn (sum(a, b));
```

```
}
```

↑

```
public class Main
```

```
{
```

```
    public static int sum (int x, int y)
```

```
    {
```

```
        return x+y; ✓
```

```
    }
```

6

5

Execution →

```
public static void main (String args[]) ✓
```

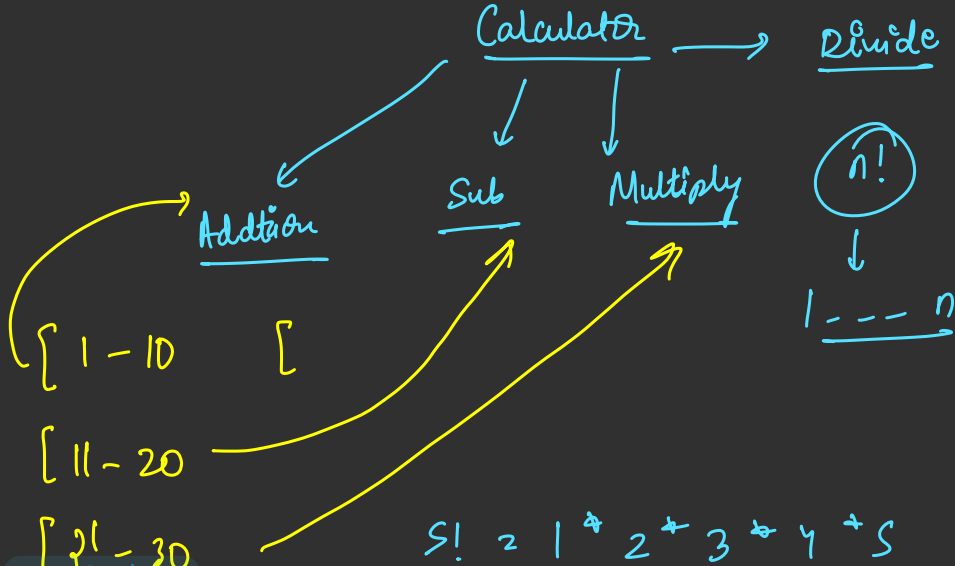
```
{    int a = 5;    int b = 6; ✓
```

```
    int c = sum(b, a);
```

```
    S.O.println(c);
```

Modular

## Use-case of Functions



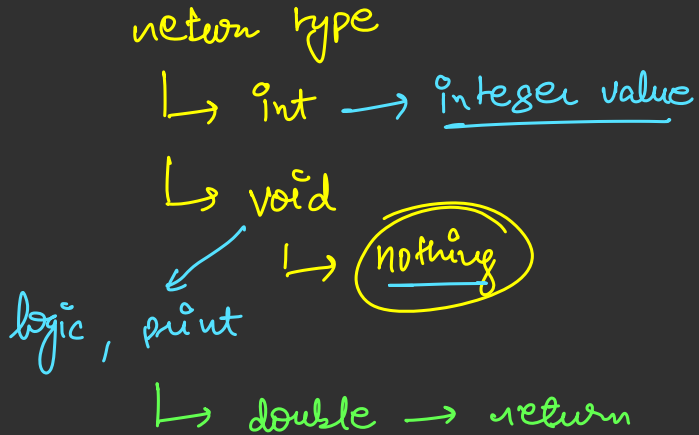
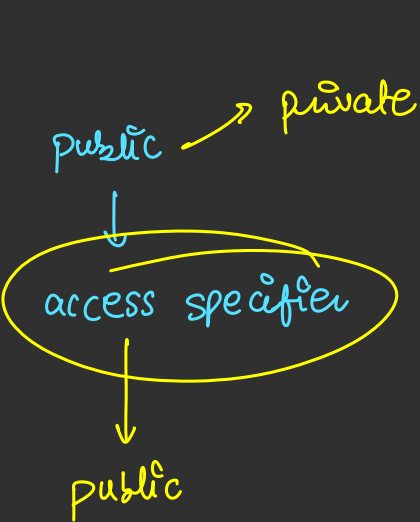
$n!$   
 $r!$   
 $(n-r)!$

```
factorial ( int n )  
{  
    [ logic ]  
}
```

code - reuse

```
int nFact = factorial (n);  
int rFact = factorial (r);
```

# Different Aspect of Functions





# Passing Arguments in Function

```
public static int sum (int a, int b, int c)
{
    return (a + b + c);
}
```

Diagram illustrating the components of a function signature and body:

- data type**: Points to the return type `int`.
- variable name**: Points to the function name `sum`.
- no statement**: Points to the opening curly brace `{`.
- last line**: Points to the closing curly brace `}`.

## Sum of number using Functions



```
public static double sum ( double a, double b,  
    double c )  
{  
    double ans = (a + b + c);  
    return ans;  
}
```

## Even odd number using Functions

decision → conditional statement

└→ Even → true }  
    Odd → false }

```
public static boolean checkEven (int n)
```

```
{
```

```
    if (n % 2 == 0)
```

```
    {
        return true;
```

```
    }
```

```
    else
```

```
    {
        return false;
```

```
    }
```

```
}
```

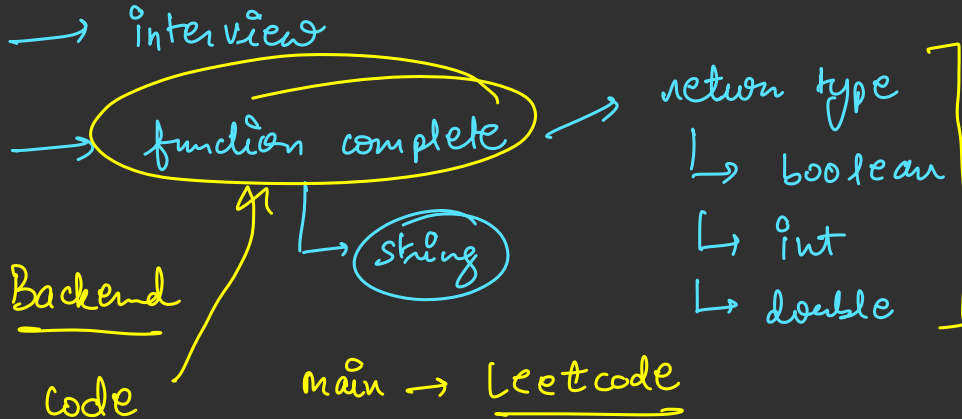
$$\frac{n = 4}{}$$



$\% 2 \rightarrow \text{Even}$   
 $\downarrow$   
 $\text{No} \rightarrow \text{Odd}$

# Understand how to submit questions on Leetcode

We have to complete functions on leetcode



## Scope of Variables in Function

↳ accessible / exist

public class Main

```
{  
  public static void print(int b)  
  {  
    s.o. len(b);  
  }  
}
```

↳ (6) → local

```
public static void main (String args[])  
{  
  ✓ int a = 6;  
  ✓ print(a);  
}
```

→ local

## Scope of Variables in Function

```
public class Main
```

```
{
```

```
    static int a = 5;
```

```
    public static void print(int b)
```

```
    {
```

```
        S.O.Plm(b);
```

```
    }
```

```
        S.O.Plm(a);
```

```
    public static void main(String arg[])
```

```
    {
```

```
        print(5);
```

```
    }
```

```
        S.O.Plm(a);
```

Global Variable

```
if ( n % 2 == 0 )
```

```
{  
    int a = 5;
```

```
    int b = 6;
```

```
}
```

```
    s.o. Pen(a);
```



# Pass by Value and Pass by Reference in Function

```
public class Main
```

```
{
```

```
    public static void change (int a)
```

```
    {
```

```
        a = a + 1;
```

```
    }
```

```
    public static int main (String arg [])
```

```
    {
```

```
        int a = 5;
```

```
        change (a);
```

```
    }
```

```
        S.O.Plm (a);
```

```
        S.O.Plm (a);
```

Variable

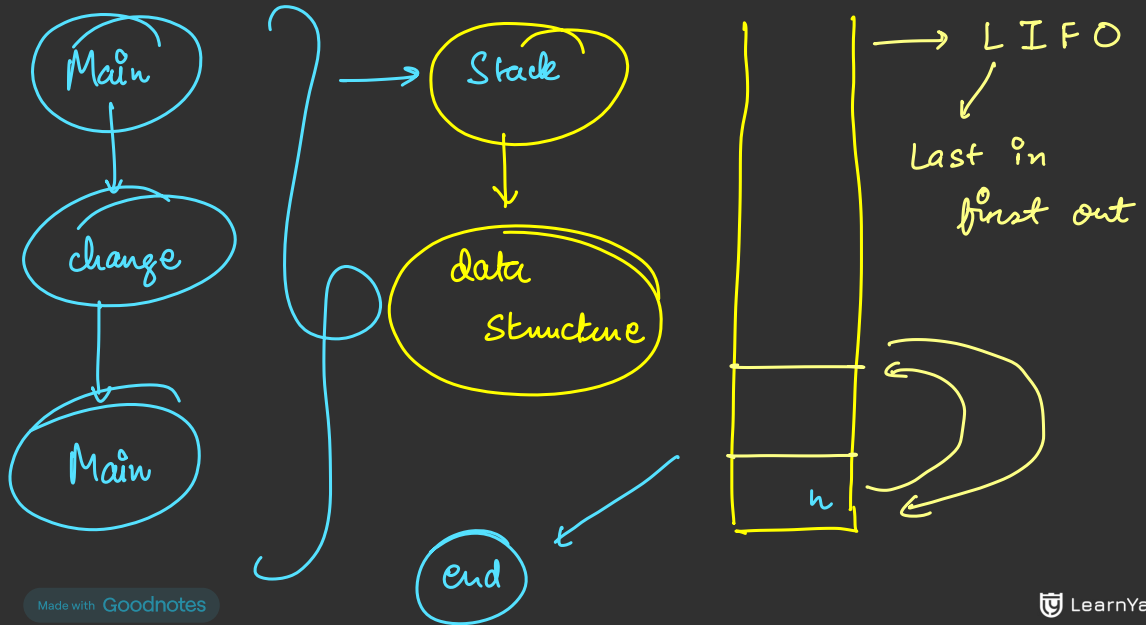
↓

int, float

↓

Pass by  
Value

# Call stack working in Function



## Can we write function inside another function ?

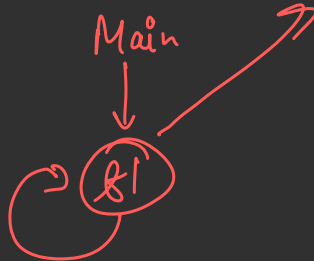
```
public class Main  
{
```

```
    public static void f1()  
    {  
        f1();  
        S.O.Pln ("1");  
    }
```

```
    public static void f2()  
    {  
        S.O.Pln ("2");  
    }
```

```
→ main ( )  
{  
    f1();  
}
```

Recursion  
↑  
infinite loop



## Extra question [Armstrong using Function]

1 - - - N  $\rightarrow$  1 5 3

$$1 + 125 + 27$$

$\downarrow$

153

$\downarrow$

Armstrong Number

$$\begin{array}{r} 1^3 + 5^3 + 3^3 \\ \hline 1 \quad 125 \quad 27 \end{array}$$

1 - - - - N  $\longrightarrow$  for loop

```
for (int i = 1; i <= N; i++)  
{  
    if (isArmstrong(i) == true)  
    {  
        S.O. Pln(i);  
    }  
}
```

```
public static boolean isArmstrong (int n)
```

```
{
```

```
    int copy = n;
```

```
    int sum = 0;
```

```
    while (n > 0)
```

```
    {  
        int lD = n % 10;
```

```
        sum = sum + lD * lD * lD;
```

```
        n = n / 10;
```

```
    }
```

sum of  
cube of  
digit

```
if (sum == copy)
{
    return true;
}
else
{
    return false;
}
}
```

# Practice and Homework Questions

## Homework questions -

<https://codeforwin.org/c-programming/c-program-to-find-maximum-and-minimum-using-functions>

<https://codeforwin.org/c-programming/c-program-to-find-prime-numbers-between-two-intervals-using-function>

<https://codeforwin.org/c-programming/c-program-to-print-armstrong-numbers-between-1-to-n-using-function>



*Thank You!*

Please practice more questions and examples as above !!