

# sum of the first n numbers

$$\text{sum}(n) = 1 + 2 + 3 + \dots + n-1 + n$$

$$\text{If } n = 5 \text{ sum}(n) = 1 + 2 + 3 + 4 + 5 = 15$$

$$\text{If } n = 6 \text{ sum}(n) = 1 + 2 + 3 + 4 + 5 + 6 = 21$$

$$\text{sum}(6) = \text{sum}(5) + 6$$

And in general

$$\text{sum}(n) = \text{sum}(n-1) + n$$

## sum – non recursive function

```
double sumiteration( int n )  
{  
    double sum1;  
    sum1 = 0 ;  
    for ( int i =1; i <= n ; i ++)  
        sum1 = sum1 +i;  
    return ( sum1);  
}
```

# sum-recursive function

```
double sum( int n )  
{  
    if ( n == 0 ) // base case  
        return 0;  
  
    // recursive case  
    return n + sum( n - 1 );  
}
```