

R Program to Find the Factorial of a Number Using Recursion



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In this example, you'll learn to find the factorial of a number using a recursive function.

To understand this example, you should have the knowledge of following R programming topics:

- R Functions
- R Recursive Function
- R if...else Statement

The factorial of a number is the product of all the integers from 1 to the number.

For example, the factorial of 6 (denoted as 6!) as

$$1 * 2 * 3 * 4 * 5 * 6 = 720$$

Factorial is not defined for negative numbers and the factorial of zero is one, $0! = 1$.

In this example, the factorial of a number is calculated using a recursive function. However, you can also calculate it without the recursive function.

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Example: Find Factorial of a number using recursion

```
recur_factorial <- function(n) {  
  if(n <= 1) {  
    return(1)  
  } else {  
    return(n * recur_factorial(n-1))  
  }  
}
```

Output

```
> recur_factorial(5)  
[1] 120
```

Here, we ask the user for a number and use recursive function `recur_factorial()` to compute the product upto that number.

Lets suppose the user passes 5 to the function.

Inside the `recur_factorial()`, the number 5 is multiplied to the factorial of $(5 - 1 = 4)$.

4 is multiplied again to the factorial of $(4 - 1 = 3)$. This goes on until the number reaches 1.

Now, all previous functions of 2, 3, 4 and 5 returns the result one by one giving you the final result `1*2*3*4*5`, which equals 120.