Fibonacci Sequence Using Recursion in R

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In this article, you find learn to print the fibonacci sequence by creating a recursive function, recurse_fibonacci().

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

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

The first two terms of the Fibonacci sequence is 0 followed by 1. All other terms are obtained by adding the preceding two terms.

This means to say the n^{th} term is the sum of $(n-1)^{th}$ and $(n-2)^{th}$ term.

```
The Fibonacci sequence: 0, 1, 1, 2, 3, 5, 8, 13, 21
```

Example: Fibonacci Sequence in R

```
# Program to display the Fibonacci sequence up to n-th term using recursive functions
recurse_fibonacci <- function(n) {
if(n <= 1) {
return(n)
} else {
return(recurse_fibonacci(n-1) + recurse_fibonacci(n-2))
}
}
# take input from the user
nterms = as.integer(readline(prompt="How many terms? "))
# check if the number of terms is valid
if(nterms <= 0) {
print("Plese enter a positive integer")
} else {
print("Fibonacci sequence:")
for(i in 0:(nterms-1)) {
print(recurse_fibonacci(i))
}
}
```

Output

```
How many terms? 9
[1] "Fibonacci sequence:"
[1] 0
[1] 1
[1] 1
[1] 2
[1] 3
[1] 5
[1] 8
[1] 13
[1] 21
```

Here, we ask the user for the number of terms in the sequence.

A recursive function `recurse_fibonacci()` is used to calculate the nth term of the sequence. We use a `for` loop to iterate and calculate each term recursively.