

## Lab 3 Exp 1

Date: 28.03.2022

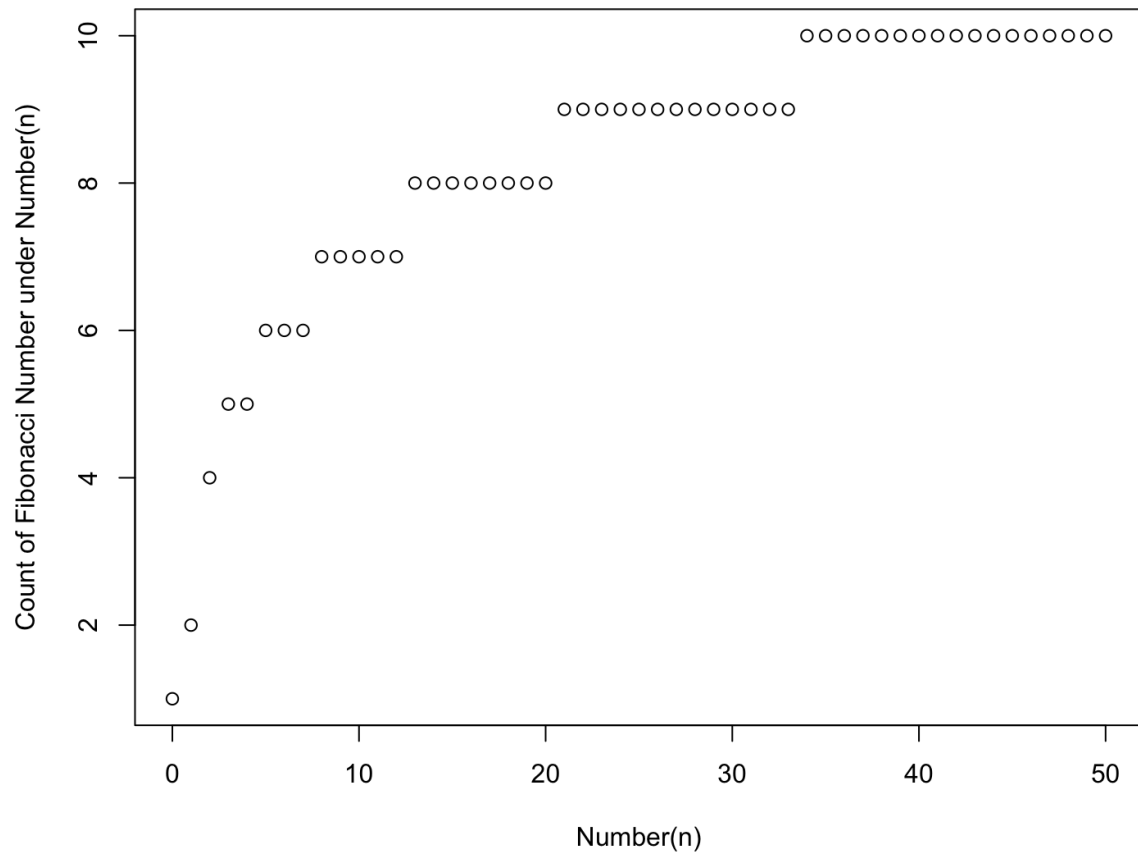
AIM: WAP in R Language to generate Fibonacci series upto n.

CODE:

```
1 # Question 1: WAP in R Language to generate Fibonacci series up to n.
2
3 # Fibonacci Series
4 fibo <- function(n){
5   a = 0
6   b = 1
7   c = 0
8   out = c(0,1)
9   if(n<= 0){
10    print('Incorrect Input')
11  }else if(n == 1){
12    return(c(a))
13  }else if(n == 2){
14    return(out)
15  }else{
16    while(c < n) {
17      c = a + b
18      a = b
19      b = c
20      if(b < n){
21        out = c(out,b)
22      }
23    }
24    return(out)
25  }
26 }
27 |
28 #checking for fibonacci series
29 fibo(8)
30 fibo(83)
31 fibo(833)
32
33 # Generation of Sequence of Number for Plotting Graph of Fibonacci Number
34 x = seq.int(0,50,1)
35 y = c()
36
37 for(i in x){
38   y = c(y,length(fibo(i)))
39 }
40 # Plotting of Graph
41 plot(x,y,xlab = 'Number(n)',ylab = 'Count of Fibonacci Number under Number(n)')
42
```

OUTPUT:

```
> fibo(8)
[1] 0 1 1 2 3 5 8
> fibo(88)
[1] 0 1 1 2 3 5 8 13 21 34 55
> fibo(833)
[1] 0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610
> |
```



## Lab 3 Exp 2

Date: 28.03.2022

AIM: WAP in R Language to generate a Reverse Fibonacci Series. E.g., n1, n2, ..., 3.2.1 where input is n. Test your implementation with 8, 83, 833 and others and summarize the result to test all the logics of the program. Mention the limitations/demerits of your implementation, if any.

CODE:

```
1 # WAP in R Language to generate a Reverse Fibonacci Series.
2 # E.g., n1, n2, ..., 3.2.1 where input is n. Test your implementation with 83,833
3 # and others and summarize the result to test all the logics of the program.
4 # Mention the limitations/demerits of your implementation, if any.
5
6 # Checking of the Number if Fibonacci or not
7 check_fibo <- function(n){
8   t1 = 5 * n^2 + 4
9   t2 = 5 * n^2 - 4
10  if (sqrt(t1) == as.integer(sqrt(t1)) || sqrt(t2) == as.integer(sqrt(t2))) {
11    return(TRUE)
12  } else {
13    return(FALSE)
14  }
15 }
16
17 # Calculation of the Previous Fibonacci Number
18 previousFibonacci <- function(n){
19   a = n / ((1 + sqrt(5)) / 2.0)
20   return(round(a))
21 }
22
23 # Reverse Fibonacci Calculation
24 reverse_fibo <- function(n){
25   num = n
26   num_check = check_fibo(n)
27   if (num_check == TRUE){
28     pre_num = previousFibonacci(num)
29     fibo_series = c(num, pre_num)
30     while(pre_num > 0){
31       fibo_num = num - pre_num
32       num = pre_num
33       pre_num = fibo_num
34       fibo_series = c(fibo_series, fibo_num)
35     }
36     return(fibo_series)
37   } else {
38     print('Given Number is not Fibonacci Number')
39     return(NULL)
40   }
41 }
42
43 # Checking Using Different Inputs
44 reverse_fibo(8)
45 reverse_fibo(83)
46 reverse_fibo(833)
```

OUTPUT:

```
> reverse_fibo(8)
[1] 8 5 3 2 1 1 0
> reverse_fibo(83)
[1] "Given Number is not Fibonacci Number"
NULL
> reverse_fibo(833)
[1] "Given Number is not Fibonacci Number"
NULL
```