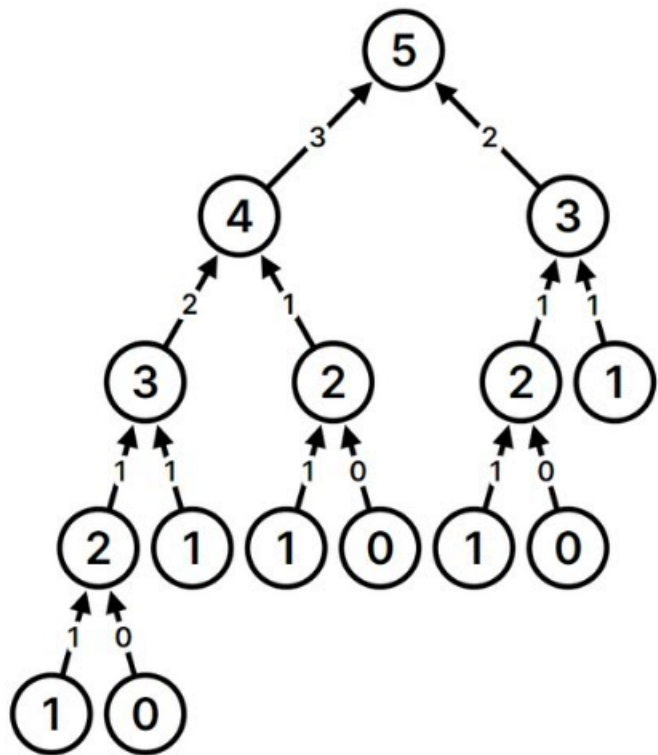


What's Recursion ? Arabic Animated intuition



Recursion

what's recursion

The process in which a function calls itself directly or indirectly is called recursion and the corresponding function is called as recursive function.

Recursion

direct

```
// An example of direct recursion
void directRecFun()
{
    // Some code....

    directRecFun();

    // Some code...
}
```

indirect

```
// An example of indirect recursion
void indirectRecFun1()
{
    // Some code...

    indirectRecFun2();

    // Some code...
}
void indirectRecFun2()
{
    // Some code...

    indirectRecFun1();

    // Some code...
}
```

Recursion

```
void func(int n)
{
    if (n==1) {return ;}
    func(n-1);
}
```

**recursion consists of
two parts**

**base case if n==1 return
statement func(n-1)**

if n=5

f(5)

|

f(4)

|

f(3)

|

f(2)

|

f(1)

**1- void function
doesn't return a value**

**2- if (n==1){return ;}
is called a base case
or a stopping condition**

**3- func(n-1) statement
makes branch
or tree**

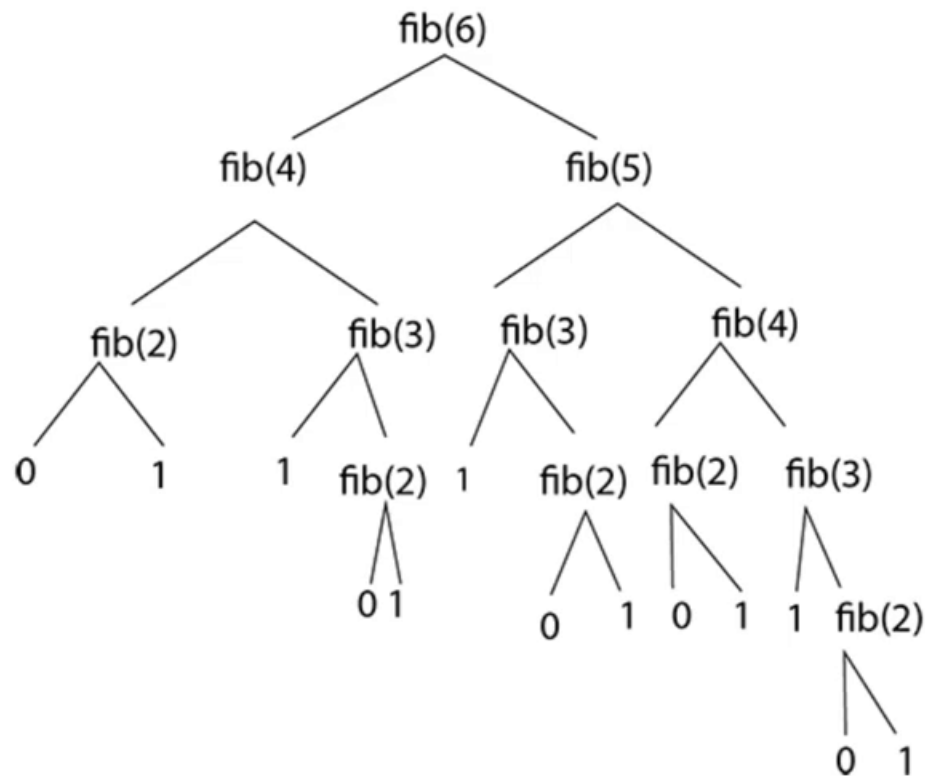
Recursion

```
void fib(int n)
{
    if (n==1 || n==0) {return ;}
    fib(n-1);
    fib(n-2);
}
```

where is the base case
where is the statement

basecase if (n==1 or n==0){return ;}
statement fib(n-1) fib(n-2)

if n=6



Recursion

let's solve this problem
write a math function to find the summation
from 1 to n

$$f(n) = n + f(n-1)$$

$$\text{if } n=1 \text{ } f(n)=1$$

$$f(5) = 5 + f(4)$$

$$1+2+3+4+5=15$$

$$5+(1+2+3+4)=15$$

```
int f(int n)
{
    if (n==1) {return 1;}
    return n+f(n-1);
}
```

$$f(5) = n + f(4)$$

$$f(4) = n + f(3)$$

$$f(3) = n + f(2)$$

$$f(2) = n + f(1)$$

$$f(1)=1$$

$$f(1)=1$$

$$f(2)=2+1=3$$

$$f(3)=3+3=6$$

$$f(4)=4+6=10$$

$$f(5)=5+10=15$$

Have you backed up your GitHub repositories yet? Automate your backups with BackHub by Rewind.

ADS VIA CARBON

Pre-defined templates

Custom

Global variables

=

=

Recursive function

python

```
def fn(n):  
    if (n == 0 or n == 1):  
        return n  
    return fn(n-1) + fn(n-2)
```

Options

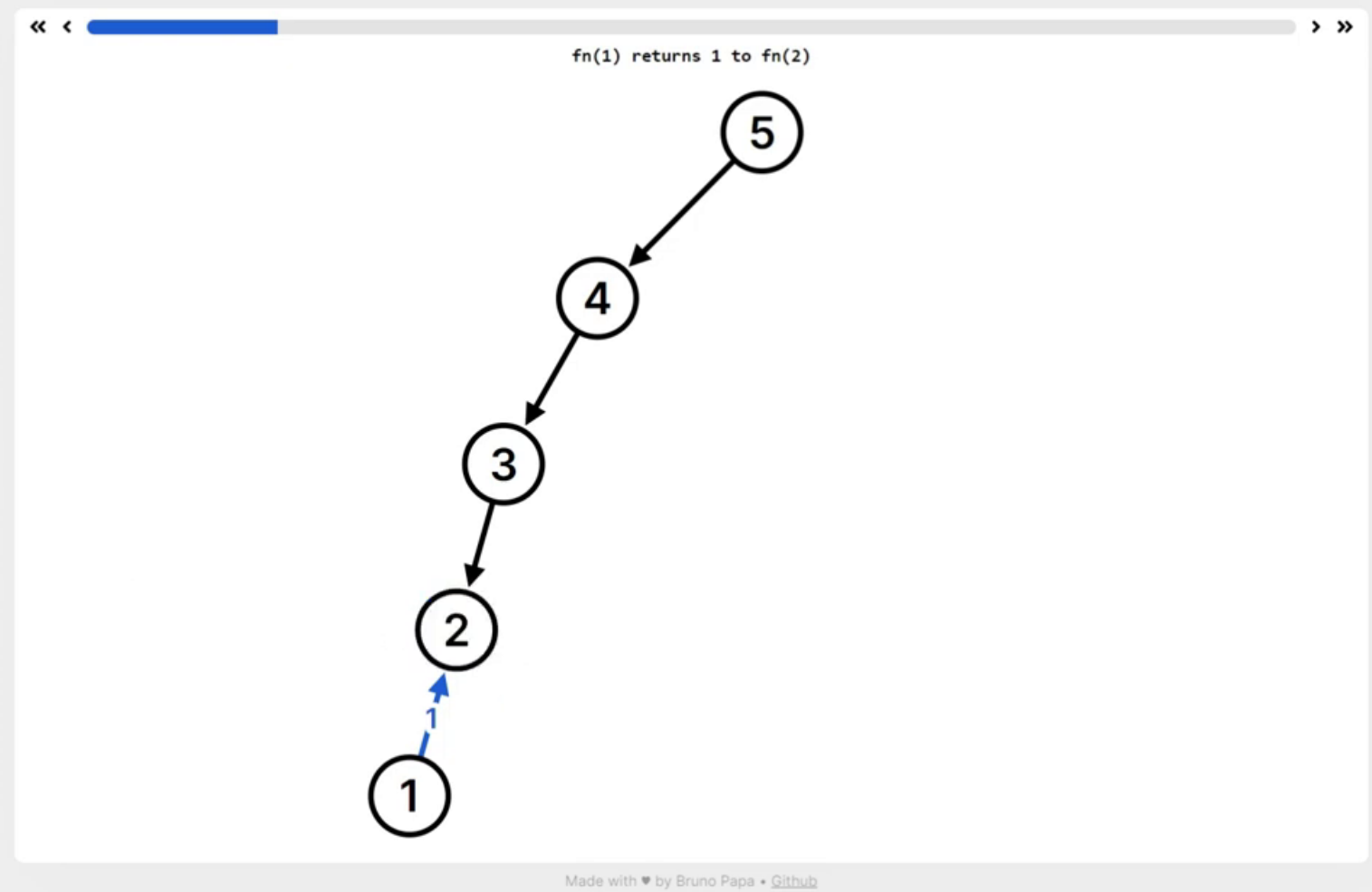
Enable step-by-step animation

Enable memoization

Enable dark mode

fn(5)

Run



Have you backed up your GitHub repositories yet? Automate your backups with BackHub by Rewind.

ADS VIA CARBON

Pre-defined templates

Custom

Global variables

=

=

Recursive function

python

```
def fn(n):  
    if (n == 0 or n == 1):  
        return n  
    return fn(n-1) + fn(n-2)
```

Options

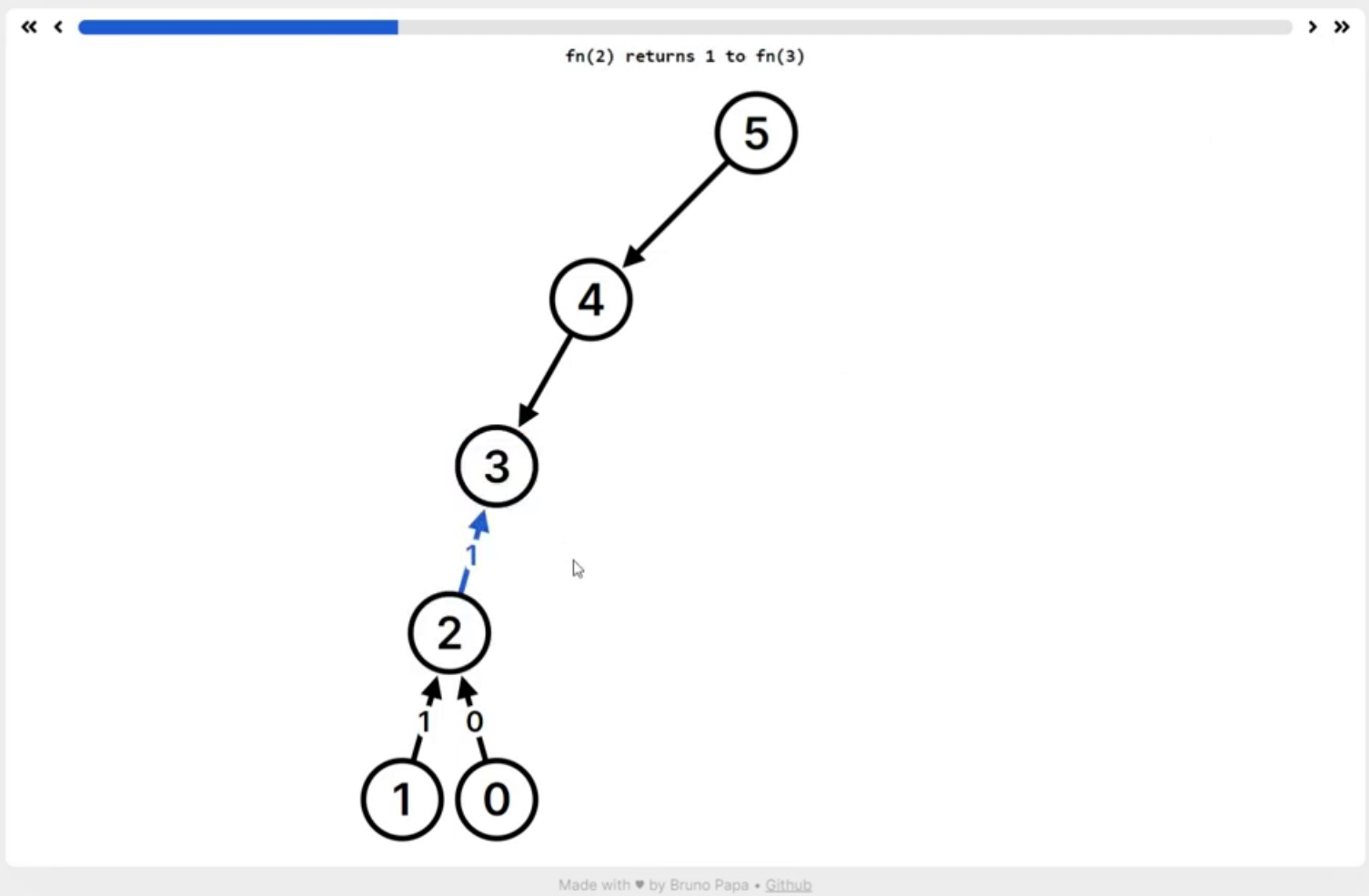
Enable step-by-step animation

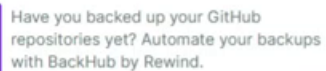
Enable memoization

Enable dark mode

fn(5)

Run





Custom

python

```
def fn(n):
    if (n == 0 or n == 1):
        return n

    return fn(n-1) + fn(n-2)
```

Enable step-by-step animation ☒

Enable memoization ☐

Enable dark mode ☐

Run

```

graph BT
    0((0)) -- 0 --> 1((1))
    1 -- 1 --> 2((2))
    2 -- 1 --> 3((3))
    3 -- 2 --> 4((4))
    4 -- 1 --> 5((5))
    style 4 fill:#0000FF,color:#FFFFFF
  
```

Made with ♥ by Bruno Papa • [Github](#)

Have you backed up your GitHub repositories yet? Automate your backups with BackHub by Rewind.

ADS VIA CARBON

Pre-defined templates

Custom

Global variables

=

=

Recursive function

python

```
def fn(n):  
    if (n == 0 or n == 1):  
        return n  
    return fn(n-1) + fn(n-2)
```

Options

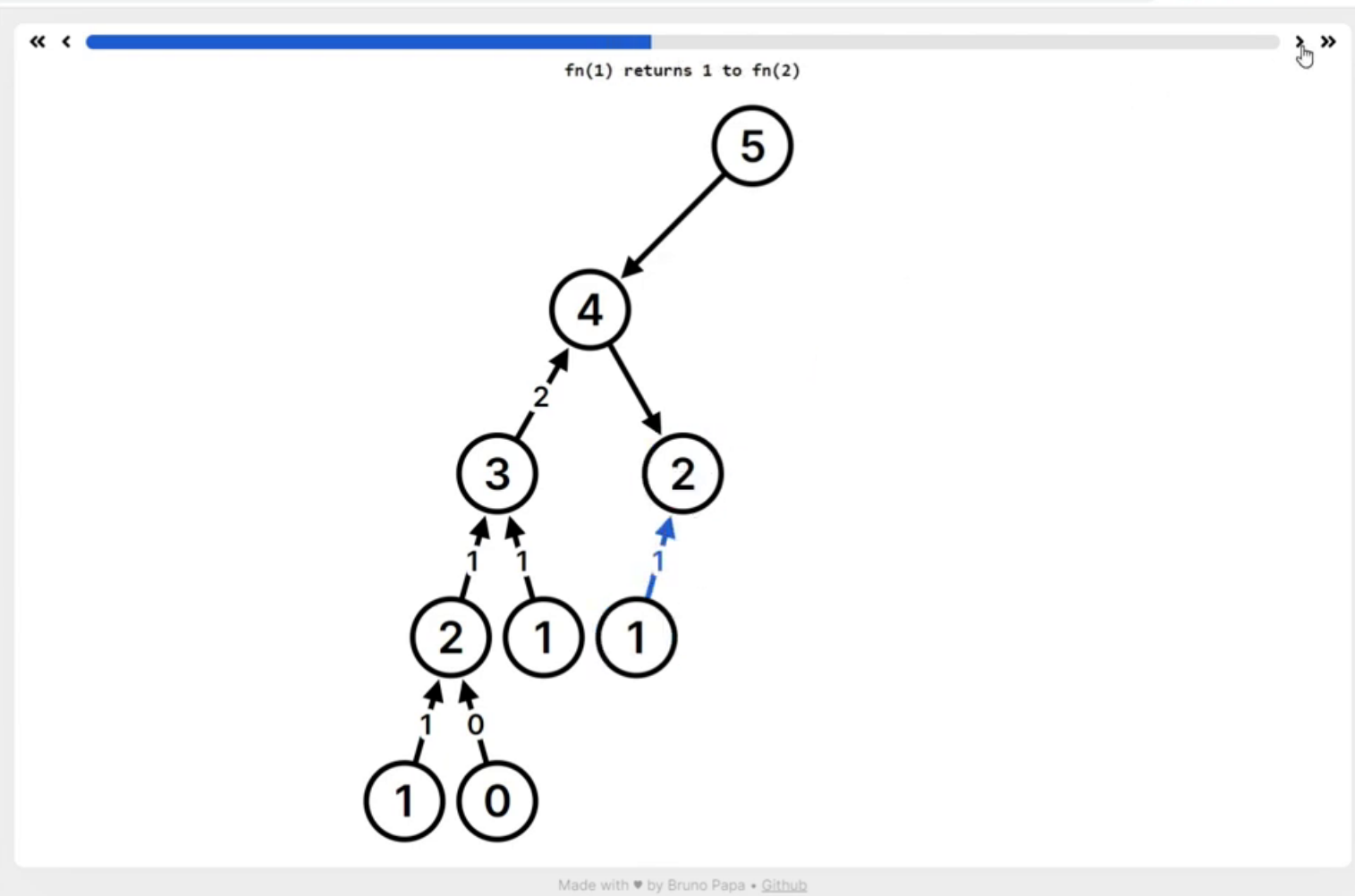
Enable step-by-step animation

Enable memoization

Enable dark mode

fn(5)

Run



Have you backed up your GitHub repositories yet? Automate your backups with BackHub by Rewind.

ADS VIA CARBON

Pre-defined templates

Custom

Global variables

=

=

Recursive function

python

```
def fn(n):  
    if (n == 0 or n == 1):  
        return n  
    return fn(n-1) + fn(n-2)
```

Options

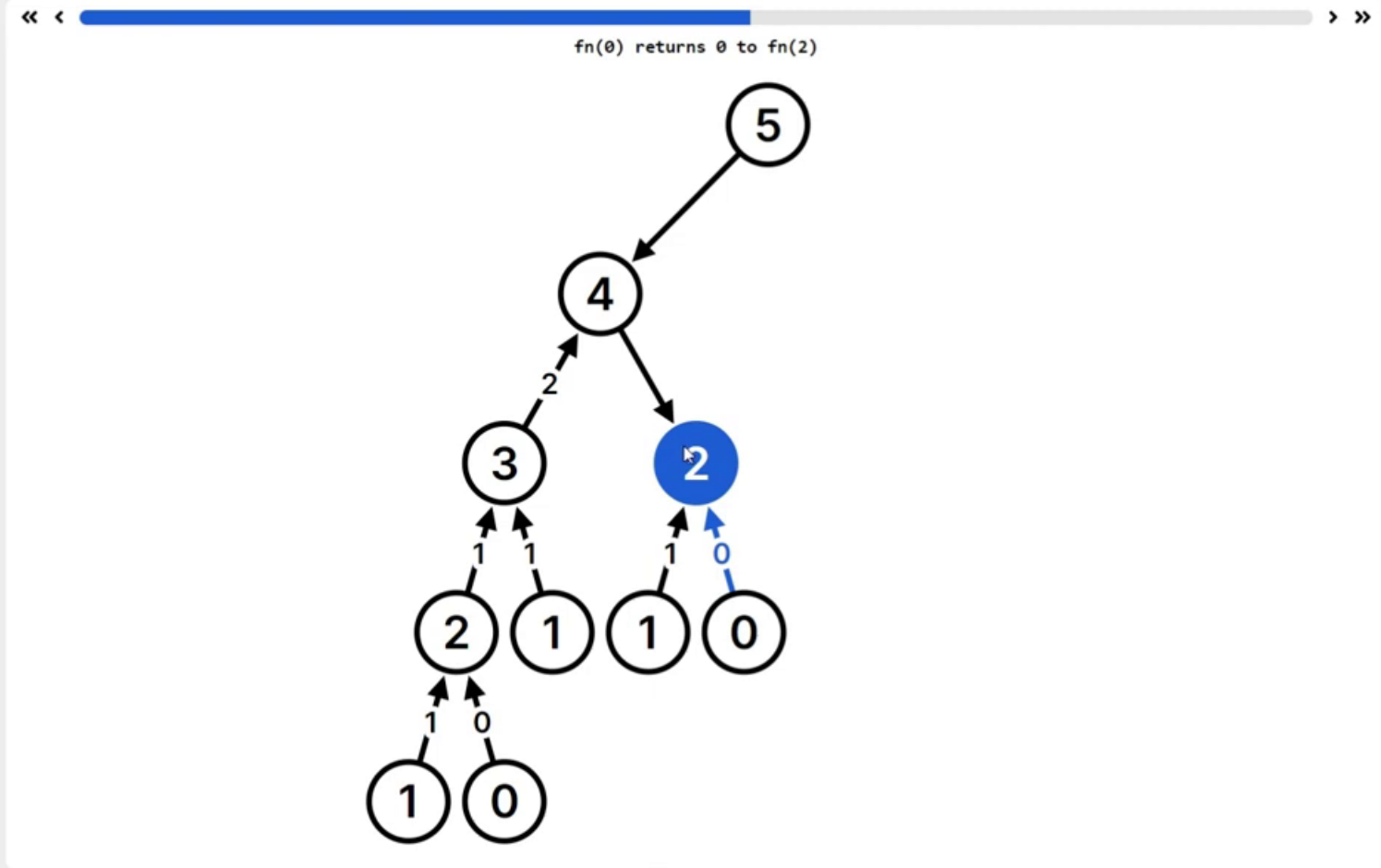
Enable step-by-step animation

Enable memoization

Enable dark mode

fn(5)

Run



 Have you backed up your GitHub repositories yet? Automate your backups with BackHub by Rewind.

Pre-defined templates

Custom

Global variables

=

=

Recursive function

python

```
def fn(n):  
    if (n == 0 or n == 1):  
        return n  
    return fn(n-1) + fn(n-2)
```

Options

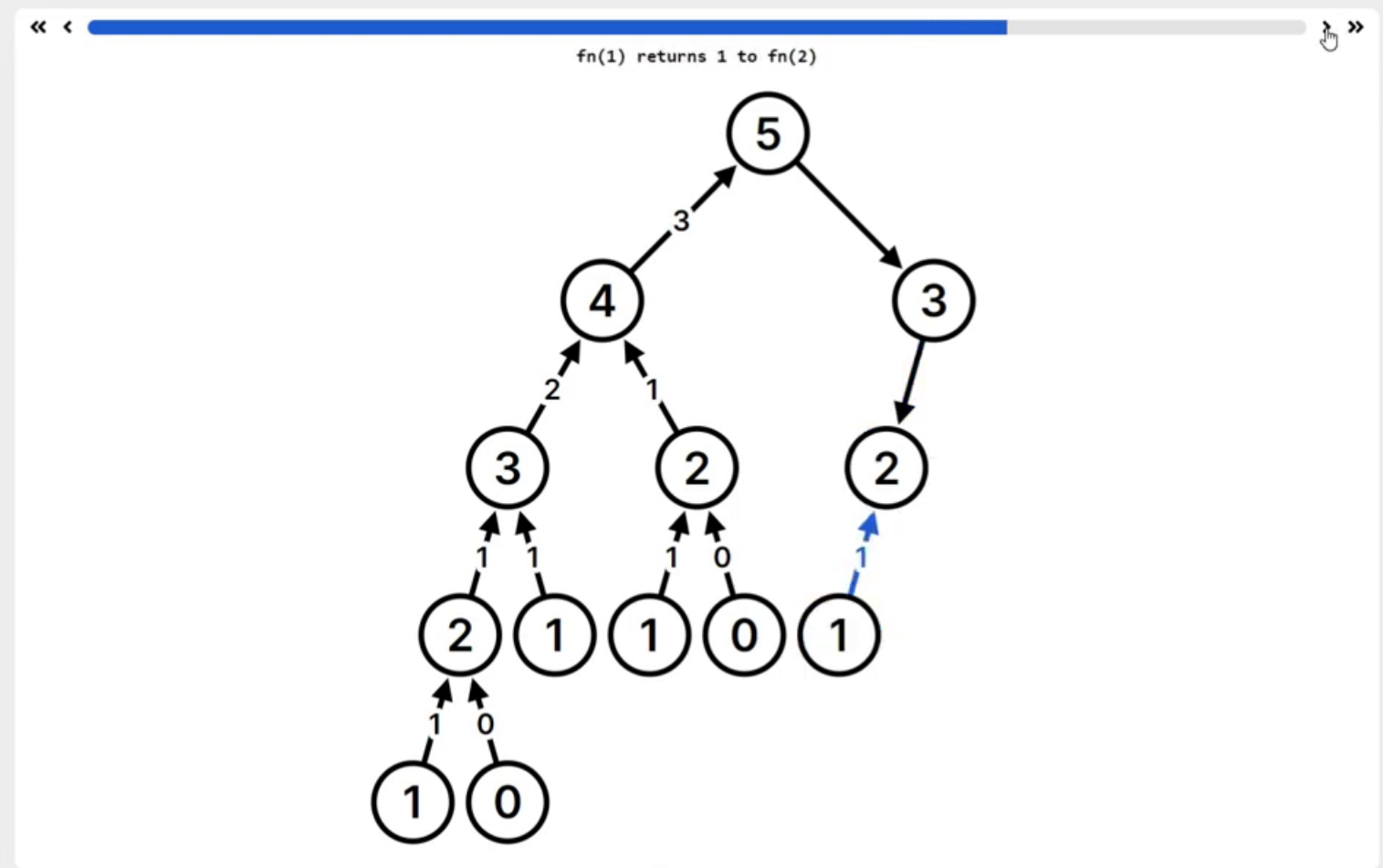
Enable step-by-step animation

Enable memoization

Enable dark mode

fn(5)

Run



 Have you backed up your GitHub repositories yet? Automate your backups with BackHub by Rewind.

Pre-defined templates

Custom

Global variables

=

=

Recursive function

python

```
def fn(n):  
    if (n == 0 or n == 1):  
        return n  
    return fn(n-1) + fn(n-2)
```

Options

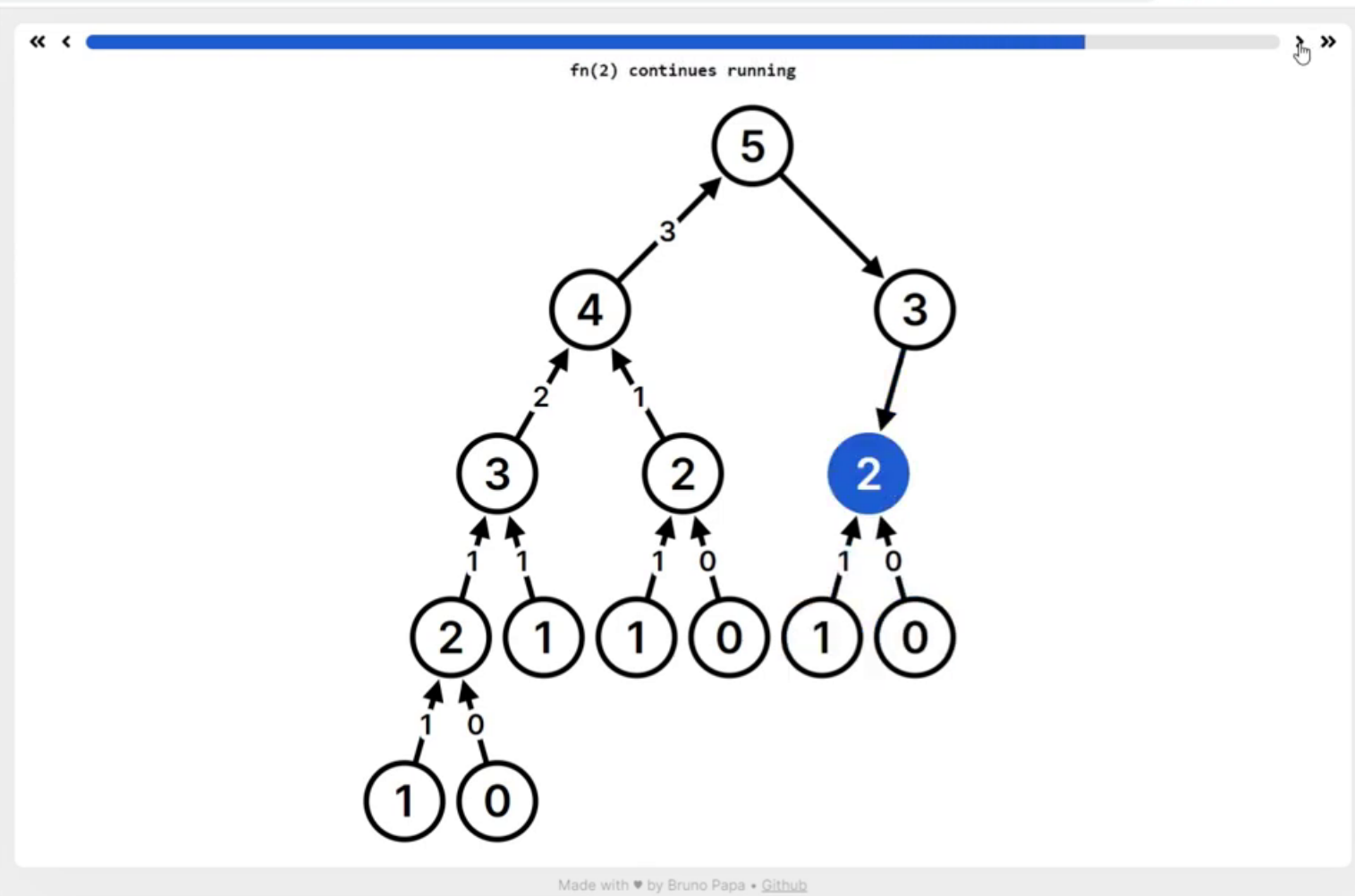
Enable step-by-step animation


Enable memoization

Enable dark mode

fn(5)

Run



 Have you backed up your GitHub repositories yet? Automate your backups with BackHub by Rewind.

Pre-defined templates

Custom

Global variables

=

=

Recursive function

python

```
def fn(n):  
    if (n == 0 or n == 1):  
        return n  
    return fn(n-1) + fn(n-2)
```

Options

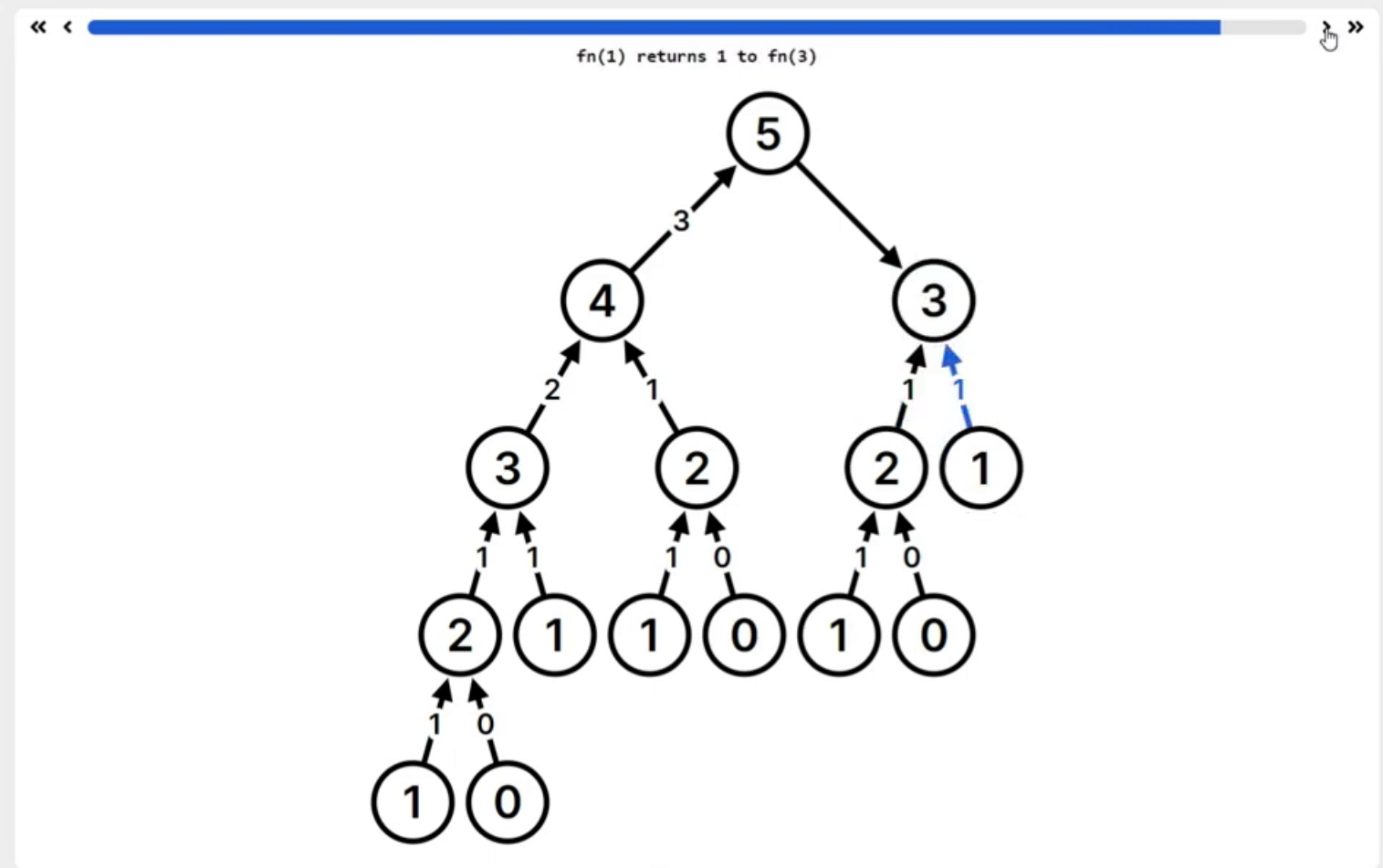
Enable step-by-step animation

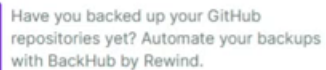
Enable memoization

Enable dark mode

fn(5)

Run





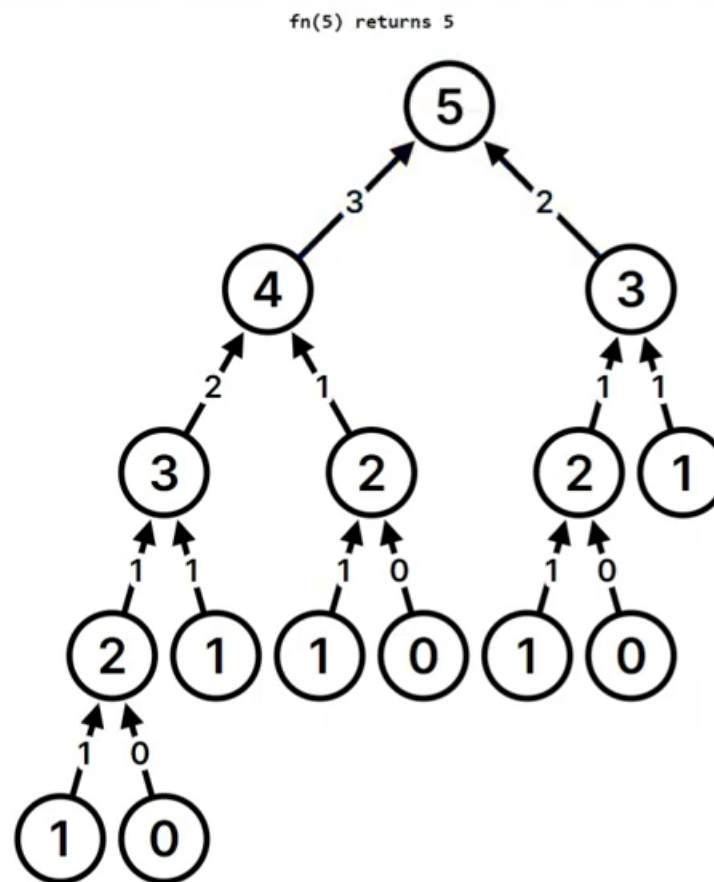
Custom

python

```
def fn(n):
    if (n == 0 or n == 1):
        return n
    return fn(n-1) + fn(n-2)
```

- Enable step-by-step animation ☒
- Enable memoization ☐
- Enable dark mode ☐

Run



Recursion

**what i should know
after this video ?**

1- what's recursion ?

2- void function vs integer function in recursion

3-recursion goes from left to right