```
sofdigits(n)
{
    n == 0   r -> 0  -> 0
    return n%10 + sod(n/10);
}
```

Recursion Tree (DP)

m(1234)
4 + S(123)
4+3+ S(12)
4+3+2+ S(1)
4+3+2+1 + S(0) = 10

```
CD(n)
    n == 0 -> r -> 0 -> 0
    ret 1 + CD(n/10);
```

m(1234)

Tree

CD(1234)
1 + (CD(123))
1+ 1+ CD(12)
1+ 1+ 1+ CD(1)
1+1+1+1+ CD(0) + 0

```
power(x, n)        (2,5)
    if n == 0
        return 1 -> 1
    return x * p(x, n-1);
```

b: x, exp: n

(↑ change) exp controlling

n: base getting multiplied

m(2,5) (x, n)

2 × p(2,4)
2 × 2 × (2,3)
2 × 2 × 2 (2,2)
2 × 2 × 2 × 2 (2,1)
2× 2× 2× 2× 2× (2,0)

32 × 1 = 32

Fib Series.

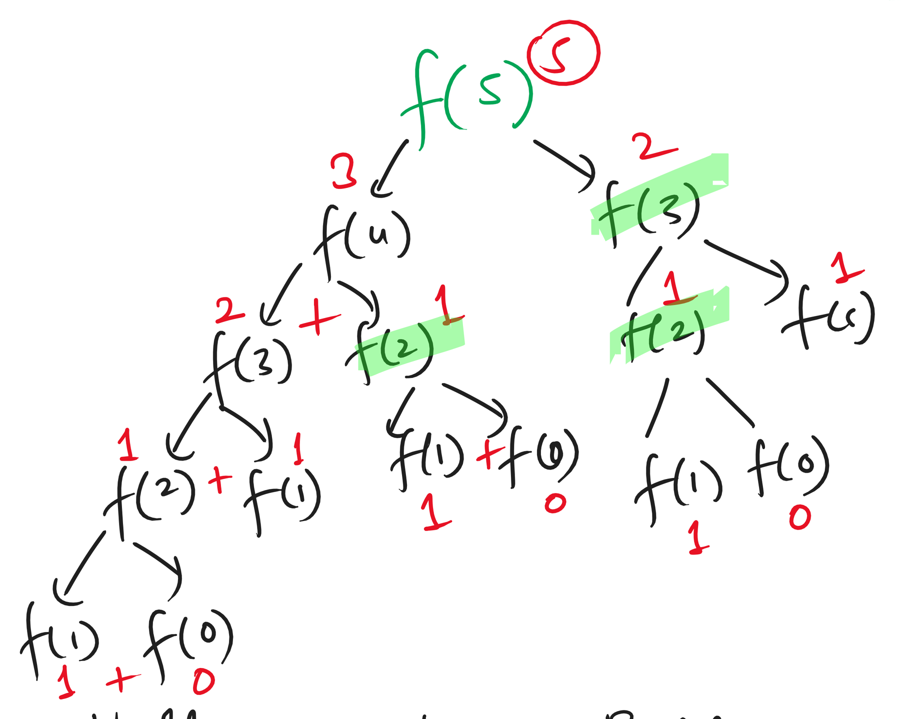
0, 1, 1, 2, 3, 5, 8, 13, 21, ...
0 1 2 3 4 5 6 7 8

8th fib no = 21

f(0) = 0
f(1) = 1
f(2) = f(1) + f(0)
f(3) = f(2) + f(1)

```
if (n <= 1)
    return n;
```

[f(n) = f(n-1) + f(n-2)] Formula



{Recursion Tree}

* Code Help -> Love Babbar   C++ / Hindi
* Take You Forward -> Striver   C++ / English
* Java -> Kunal Kushwaha (Java)

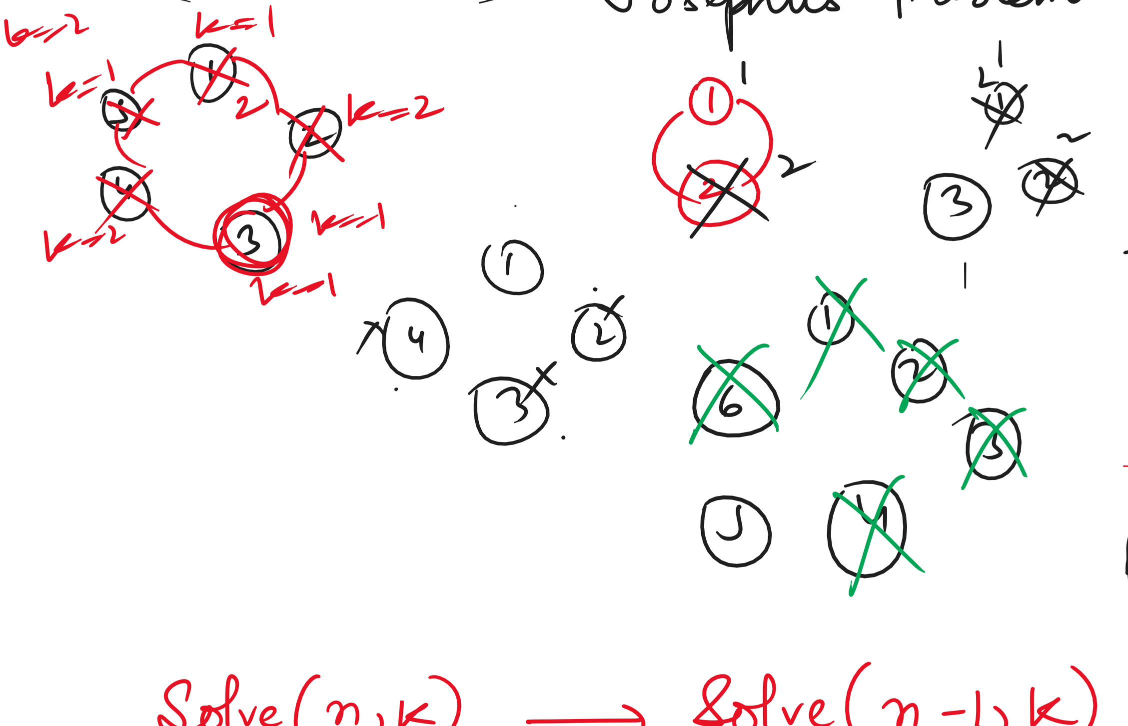
(Abdul Bari) => (pseudo code)

* Free Code Camp
* Chai Aur Code [Development]
* Traversy Media   (W3Schools)
* Tech With Tim
* Telusko

8LPA   3.5 LPA   44.5 LPA   18LPA

(1823) LC Find the Winner of the circular Game

W = 3 (n = 5, k = 2)   Josephus Problem   k = 2



n	w
1	1
2	1
3	3
4	1
5	3
6	5

Solve(n, k) -> Solve(n-1, k)
Solve(2, k) -> Solve(1, k)
Solve(3, k) -> Solve(2, k)   1 + k   1 + 2 = 3
Solve(4, k) -> Solve(3, k)   3 + k = 3+2 = 5   5 % 4 = 1
Solve(5, k) -> S(4, k)   1+k = 1+2 = 3

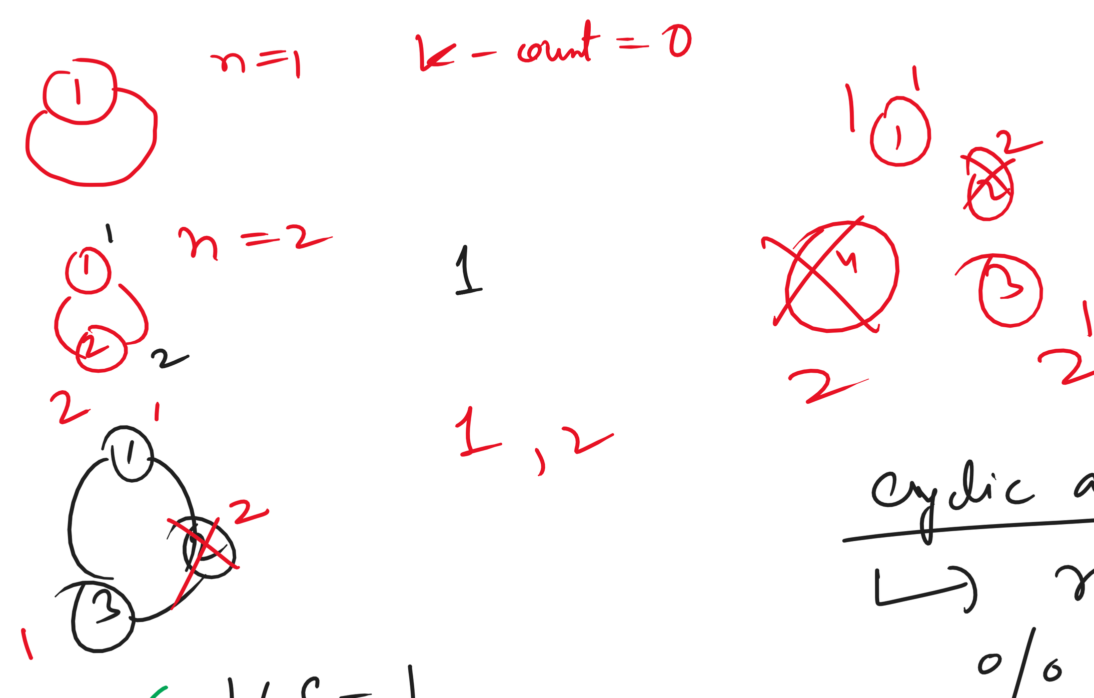
$$\text{Solve}(n, k) = [\text{Solve}(n-1, k) + k] \% n$$

n=1   k - count = 0

n=2   1

1, 2

1, 2, 3



cyclic arrangement
↳ recursion
% n
normalisation

1 % 5 = 1
2 % 5 = 2
5 % 5 = 1
5 % 5 = 0 -> 0 + 1
6 % 5 = 1
7 % 5 = 2

+1

1

1 modulo