6 → 1, 2, 3, 6

Prime Numbers

2 → 1, 2

3 → 1, 3

11 → 1, 1 1

n → (1) 2, 3, 4, 5, - — —. , n-1, (n)

```
for(i=2; i<n; i++)
{
    if (n%i == 0)
    {
        //Not Prime
    }
}
//Prime
```

TC → O(n)

≤ n/2 ⇒ TC = O(n)

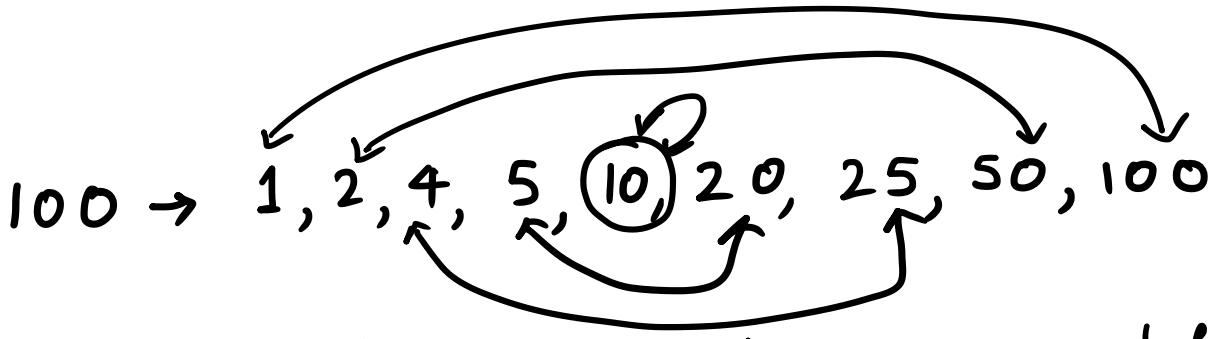
≤ √n ⇒ TC = O(√n)

12 → (1) (2) (3) (4) 5 (6) 7, 8, 9, 10, 11, (12)

1 to n/2

8 → 1, 2, 4 (8)

1 to $\sqrt{n}$



f1 = 1
f2 = 100/1 = 100

f1 = 2
f2 = 100/2 = 50

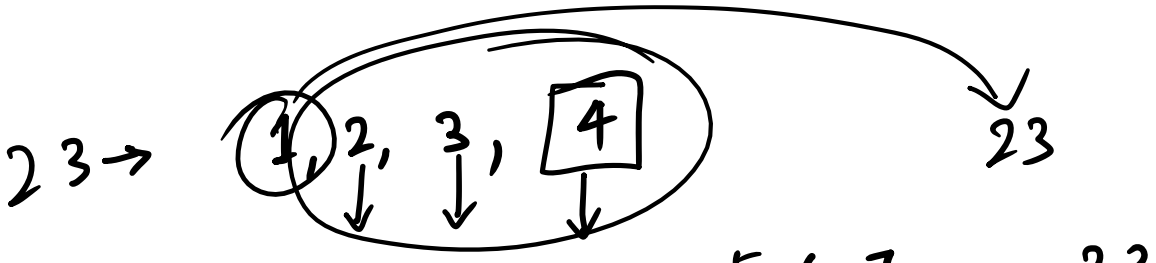
f1 = 4
f2 = 100/4 = 25

f1 = 5
f2 = 100/5 = 20

f1 = 10
f2 = 100/10 = 10

a × b = n

a ≤ $\sqrt{n}$, b ≥ $\sqrt{n}$



5, 6, 7, ... 22

"Sieve of Eratosthenes" → O(log(logN))

GCD / HCF

gcd (4, 6) = 2

gcd (8, 9) = 1

gcd (9, 0) = 9

$\frac{9}{9} = 1$

0 = 0

$gcd(8,9) = 1$

$gcd(4,16) = 4$

$0 = 0$

~~$gcd(0,0)$~~

Euclidian Algorithm

1. $gcd(a, 0) = a$
2. $gcd(a, b) = gcd(b, a \% b)$

@%.b 1/100

99/100

$gcd(\underset{a}{24}, \underset{b}{36}) \rightarrow gcd(\underset{a}{36}, \underset{b}{24})$ $24 \% 36$

$gcd(\underset{a}{24}, \underset{b}{12})$ $36 \% 24$

$gcd(\underset{a}{12}, \underset{b}{0})$ $24 \% 12$

12

$gcd(\underset{a}{27}, \underset{b}{36}) \rightarrow gcd(\underset{a}{36}, \underset{b}{27})$ $27 \% 36$

9

$gcd(\underset{a}{27}, \underset{b}{9})$ $36 \% 27$

$gcd(\underset{a}{9}, \underset{b}{0})$ $27 \% 9$

gcd(0, 9) → gcd(9, 0) 0 % 9

a b

9

TC → O(log(min(a,b)))

```
gcd( a, b )
{
    if (b == 0)
        return a }  (1)
    return gcd(b, a%b) }  (2)
}
```

O(n) [1]

Co-Prime

(6,7) → ✓

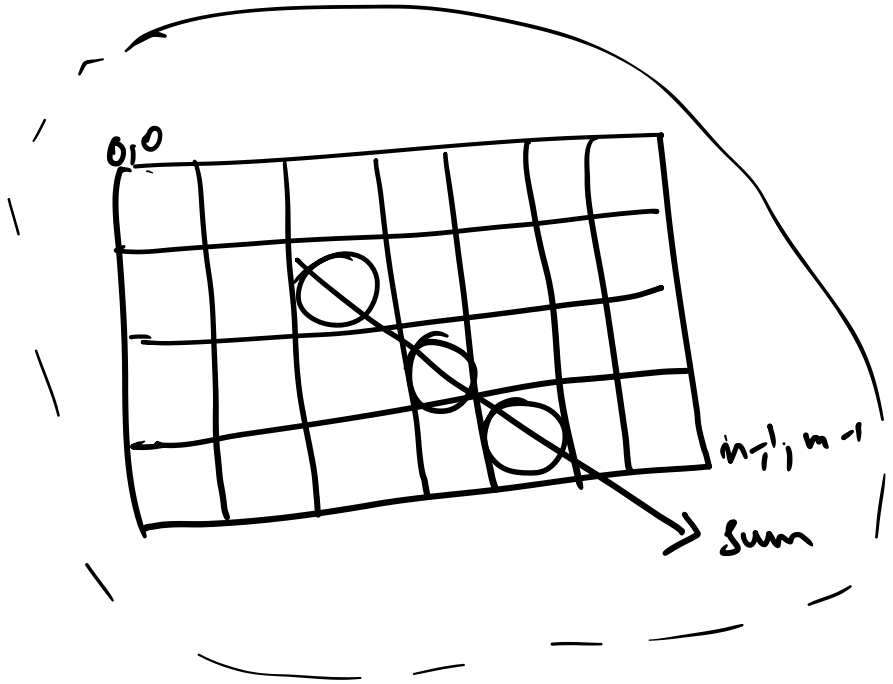
(8,9) → ✓

$1 \le n \le 1000$

10^8

O(n)

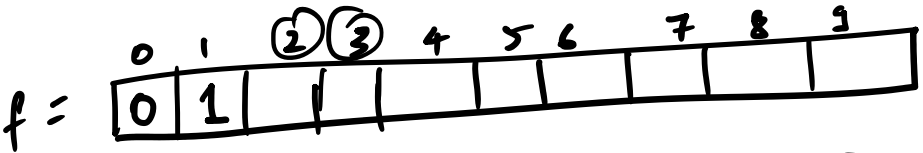
O(n²)



-1, -200

1000

-1



TC → O(n) ✓

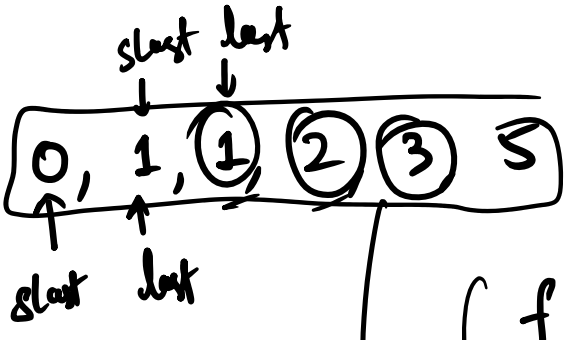
SC → O(n)

f[i] = f[i-1] + f[i-2]

f[0] = 0

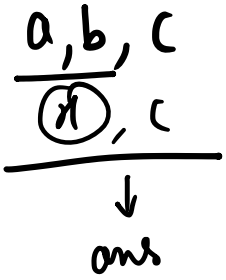
f[1] = 1

O(1)



(f = last + slast)

6


a, b, c
x, c
ans