

<u>min</u> <u>no.</u> <u>of platform</u>	0	1	2	3	4	5
arr:	900	940	950	1100	1500	1800
dep:	910	1200	1120	1130	1900	2000
arr:	900	940	950	1100	1500	1800
dep:	910	1120	1130	1200	1900	2000

Sieve of Eratosthenes

all Primes upto n

$n=30$

False \Rightarrow Prime
true \Rightarrow non-prime

1	2	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20	
21	22	23	24	25	26	27	28	29	30	

8
10

$$\frac{N}{2} + \frac{N}{3} + \frac{N}{5} + \dots$$

$$N \left(\frac{1}{2} + \frac{1}{3} + \frac{1}{5} + \dots \right)$$

$$O(N \log \log N) \approx O(N)$$

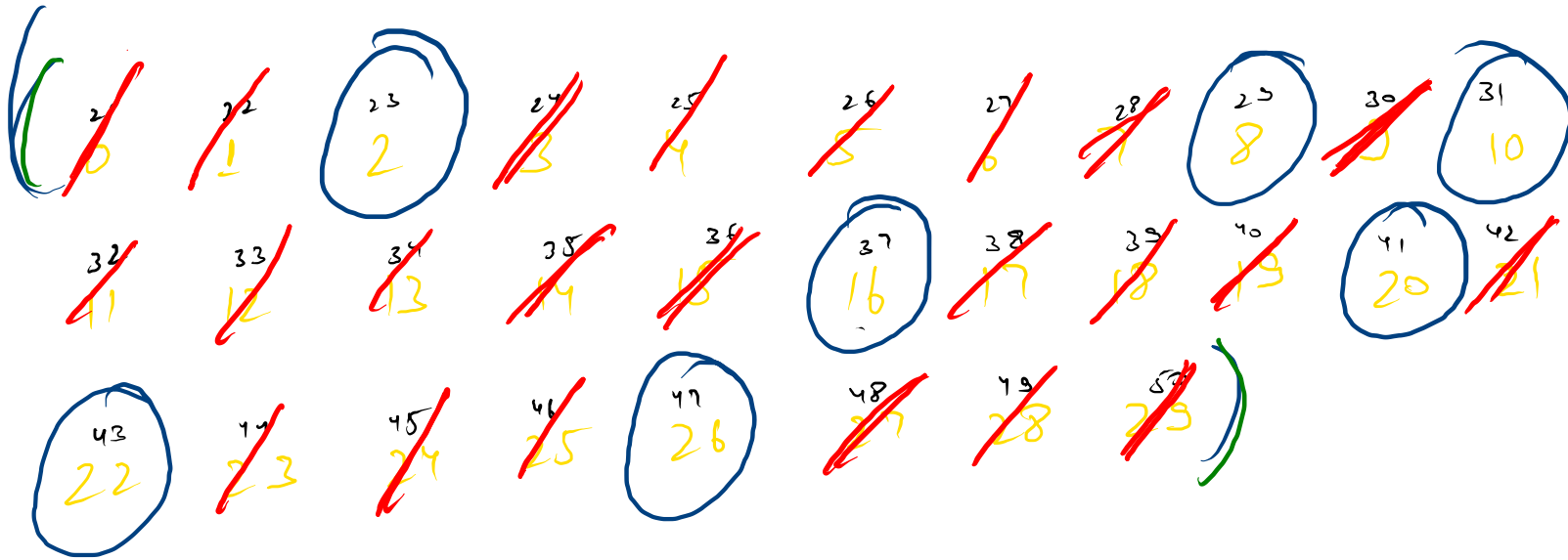
$$\log_2 \log_2 2^{26} \Rightarrow$$

$$\log 26 \Rightarrow \log 2^6 \Rightarrow 6$$

Segmented Sieve

$m = 21$

$n = 50$



\sqrt{n}

①

Diagram illustrating the sieve process for the first segment (indices 2 to 7). The numbers are shown in a box, with red arrows indicating the sieving process.

Index	Value
2	2
3	3
4	5
5	7

Two Sum

Start ↓

-8

4

i

↓

4 5

4

6

↓

6

10

j

10

-8

4 5

target = 16

$$\text{arr}[i] + \text{arr}[j] = \text{target}$$

$$i++ \leftarrow \uparrow \text{arr}[i] + \text{arr}[j] < \text{target}$$

$$j-- \leftarrow \downarrow \text{arr}[i] + \text{arr}[j] > \text{target}$$

Two diff:-

$O(n \log n)$
 $+ O(n)$

5

20

3

2

50

80

tar = 15

\Downarrow i

j

2

3

5

20

50

80

$$arr[j] - arr[i] == tar$$

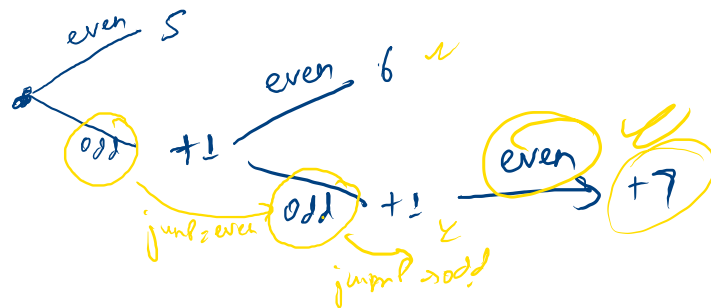
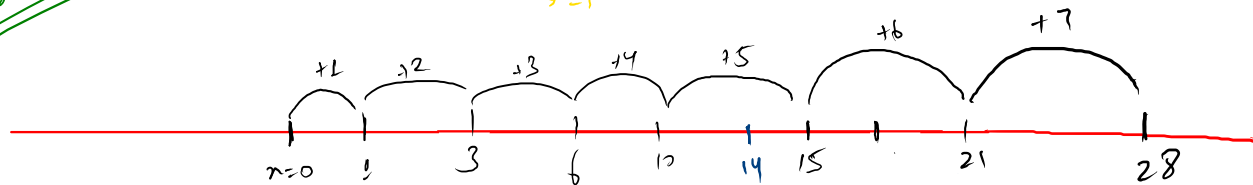
$$j \neq i \leftarrow arr[j] - arr[i] < tar$$

$$i \neq j \leftarrow arr[j] - arr[i] > tar$$

number of jumps
to reach x

$O(\sqrt{n})$

i^{th} $\rightarrow +i$
 $\rightarrow -i$



$$\rightarrow 1 + 2 + 3 + 4 + 5 + 6 = 21$$

$+ 21 - 3 = 18$

$$1 + 2 - 3 + 4 + 5 + 6 = 21 - (2 + 3) = 15$$

even reduction

max swap

⁰ 9 ¹ 9 ² 8 ³ 8 ⁴ 8 ⁵ 5 ⁶ 3 ⁷ 2 ⁸ 1 ⁹ 4 ¹⁰ 7

0	1	2	3	4	5	6	7	8	9	10
-1	8	7	6	5	4	3	2	1	0	-1

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$$O(10+n) \approx O(n)$$

$$O(10) \approx O(1)$$