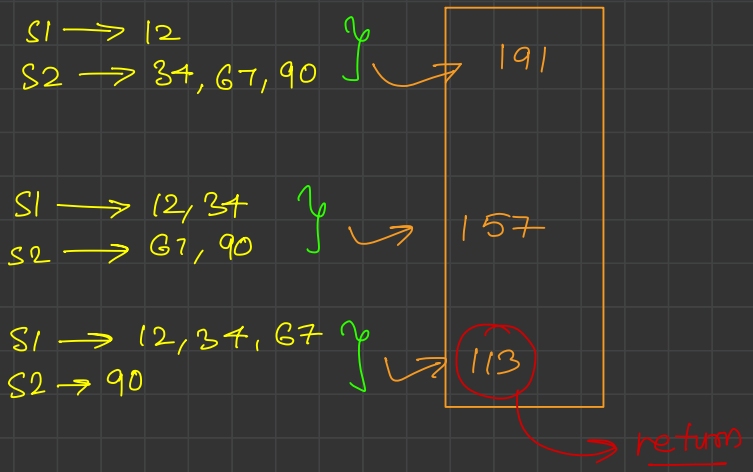
{Binary search over Soln}

Allocate Minm Number of Pages

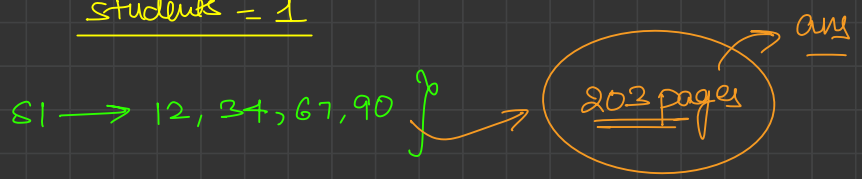
books[] = { 0: 12, 1: 34, 2: 67, 3: 90 } students = 2



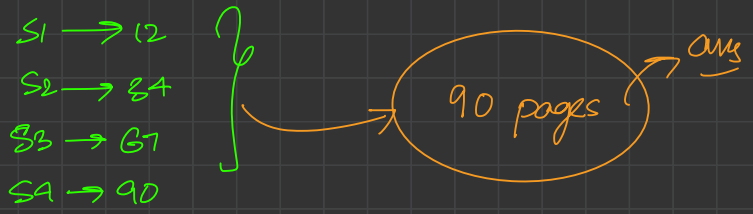
{
1. Each student should have minm one book
2. Books allocated to a student should be in a contegenous manner.
3. All Books should be given away

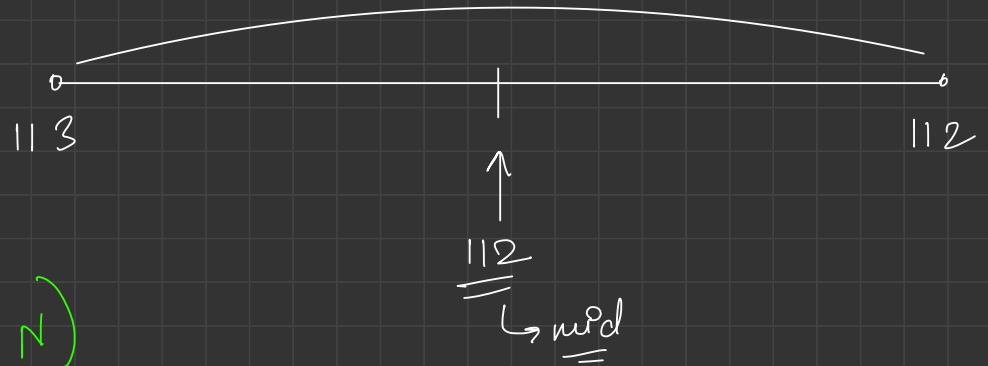
books[] = { 0: 12, 1: 34, 2: 67, 3: 90 } students = 2

Case 1 students = 1



Case 2 students = 4





TC: $O(N * \log_2 N)$

pans = 176 177 113

minimize

books[] = { 0: 12, 1: 34, 2: 67, 3: 90 } limit = 146

S1 → 12 + 34 + 67
S2 → 90

---

books[] = { 0: 12, 1: 34, 2: 67, 3: 90 } limit = 117

S1 → 12 + 34 + 67
S2 → 90

---

books[] = { 0: 12, 1: 34, 2: 67, 3: 90 } limit = 103

S1 → 12 + 34
S2 → 67
S3 → 90

books[] = { 0: 12, 1: 34, 2: 67, 3: 90 } limit = 110

S1 → 12 + 34
S2 → 67
S3 → 90

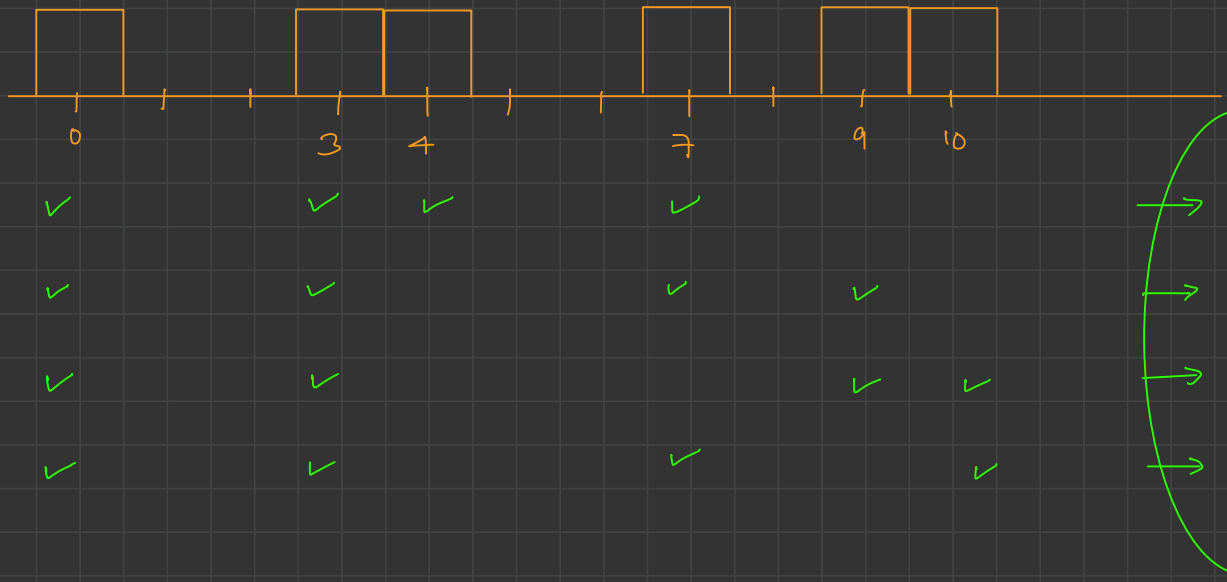
---

books[] = { 0: 12, 1: 34, 2: 67, 3: 90 } limit = 113

S1 → 12 + 34 + 67
S2 → 90

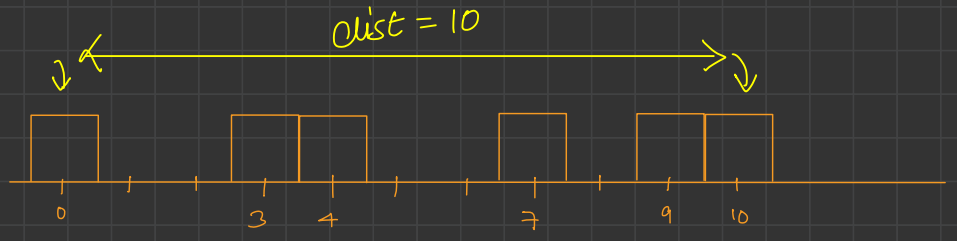
Aggressive Cows

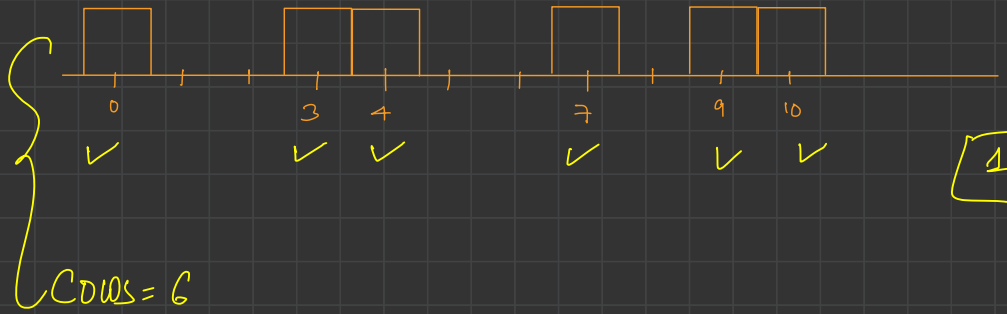
$pos[] = \{0, 7, 4, 9, 3, 10\}$ cows = 4

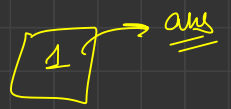


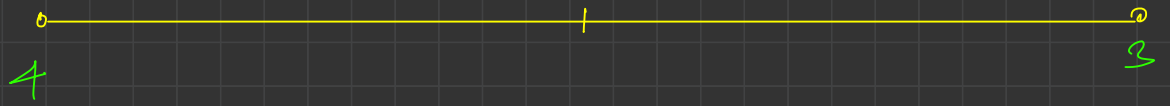
pos[] = {0, 7, 4, 9, 3, 10} cows = 4

Case 1 cows = 2









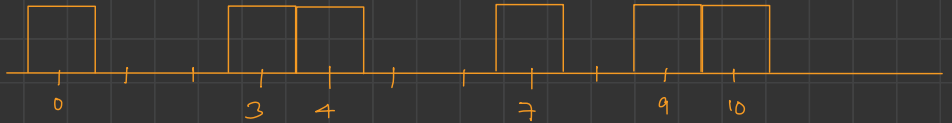
pairs = ~~2~~ 3

min dist = 5 ✓

✓ ✓

Cows = 2

min dist = 2



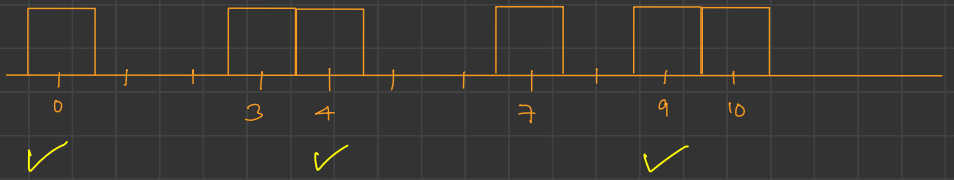
✓ ✓ ✓ ✓

Cows = 4

min dist = 3

cows = 4

min dist = 4

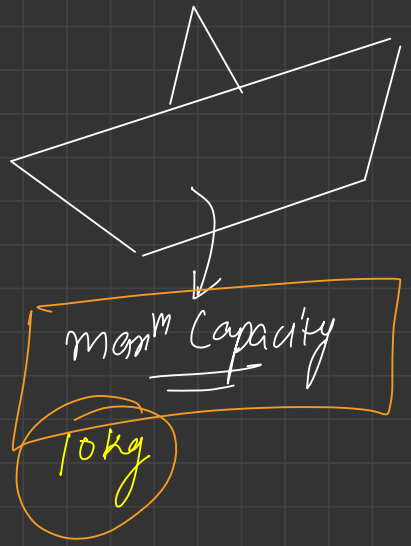


cows = 3

Capacity to ship packages within D days

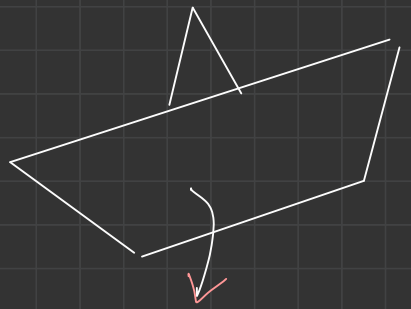
9 8 7 6 5 4 3 2 1

days = 5



minimize

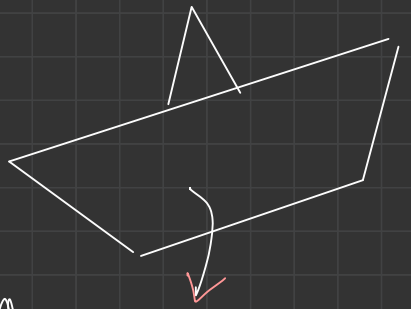
9 8 7 6 5 4 3 2 1



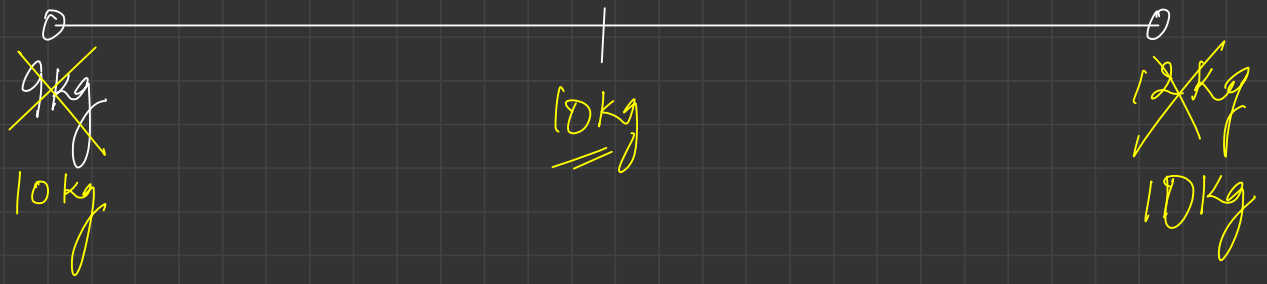
Case 1 days = 1

min cap = 45 kg

Case 2 days = 8



min cap = 9 kg



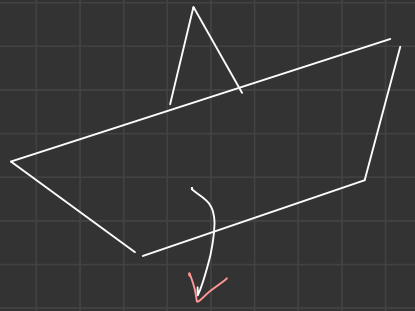
pans = ~~2~~ ~~1~~ ~~0~~

11kg

9 8 7 6 5 4 3 2 1

day 1 → 1 + 2 + 3 + 4 + 5 + 6

day 2 → 7 + 8 + 9

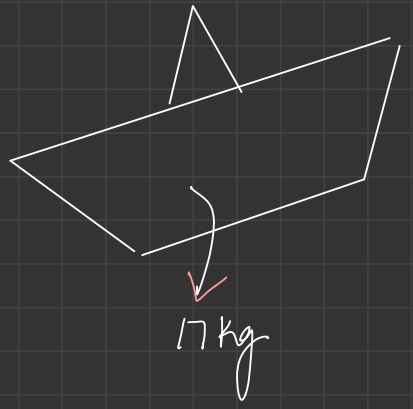


9 8 7 6 5 4 3 2 1

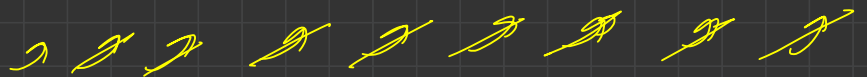
day 1 → 1 + 2 + 3 + 4 + 5

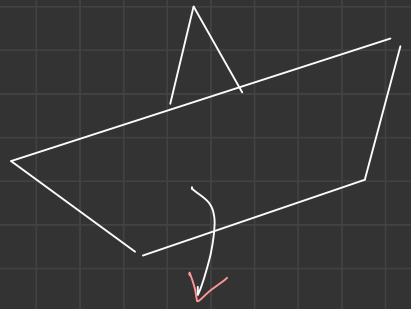
day 2 → 6 + 7

day 3 → 8 + 9



9 8 7 6 5 4 3 2 1





day 1 → 1+2+3+4

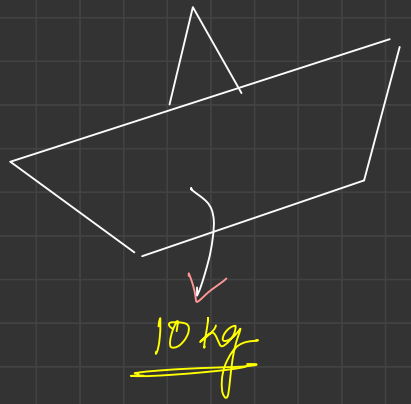
day 2 → 5+6

day 3 → 7

day 4 → 8

day 5 → 5

9 8 7 6 5 4 3 2 1



day 1 → 1+2+3+4

day 2 → 5

day 3 → 6

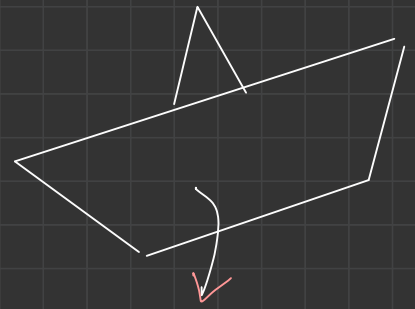
day 4 → 7

day 5 → 8

day 6 → 9

10 kg

9 8 7 6 5 4 3 2 1



day1 → 1+2+3+4

day2 → 5+6

day3 → 7

day4 → 8

day5 → 9

Minimum Limit of Balls in a Bag

arr[] = {2, 4, 8, 2} maxOpt = 4

Case 1 : maxOpt = 10 {1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1}

↳ penality = 1 ↳ ans

Case 2 : maxOpt = 0 {2, 4, 8, 2}

↳ penality = 8

pairs = $\binom{2}{2}$

arr[] = {2, 4, 8, 2}

penalty = 4

(4,4)

opt = 1

arr[] = {2, 4, 8, 2}

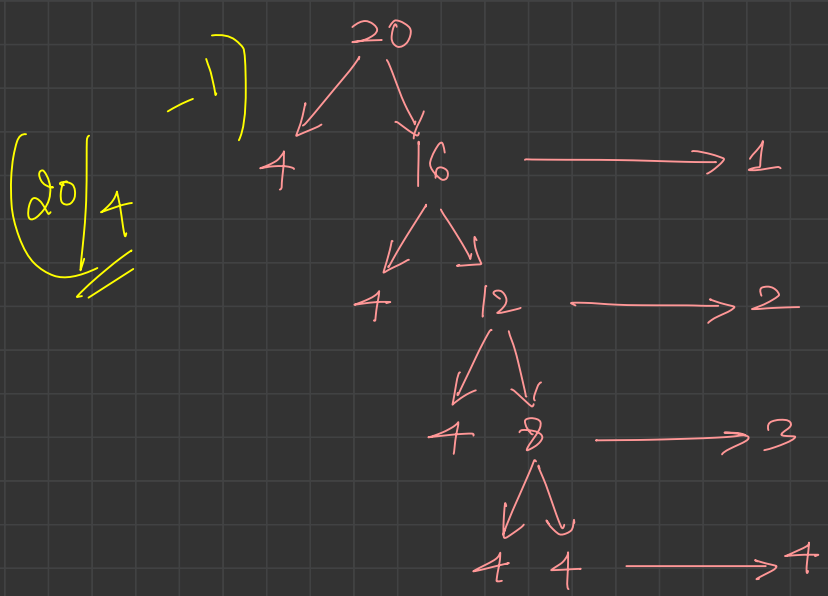
penalty = 2

(2,2) (2,6) (2,4) (2,2)

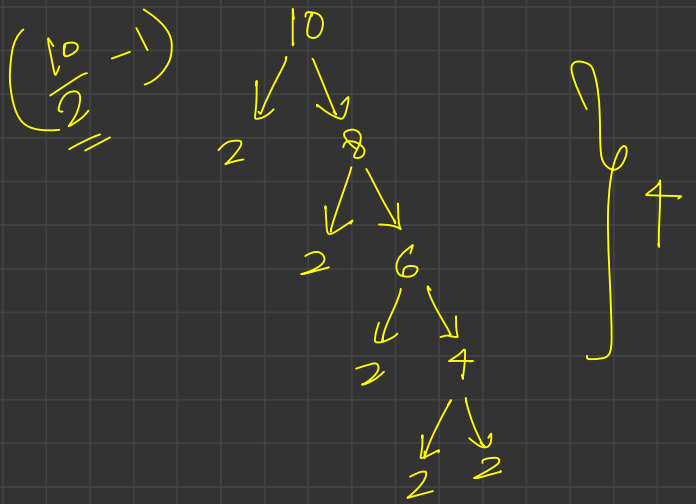
opt = XXX

4

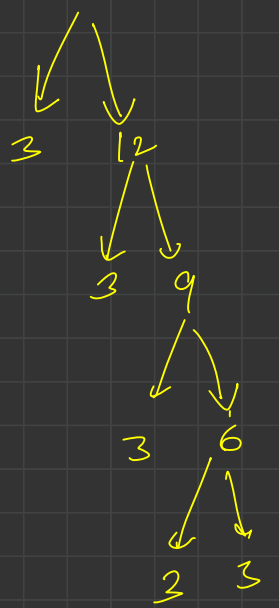
Balls = 20 penality = 4



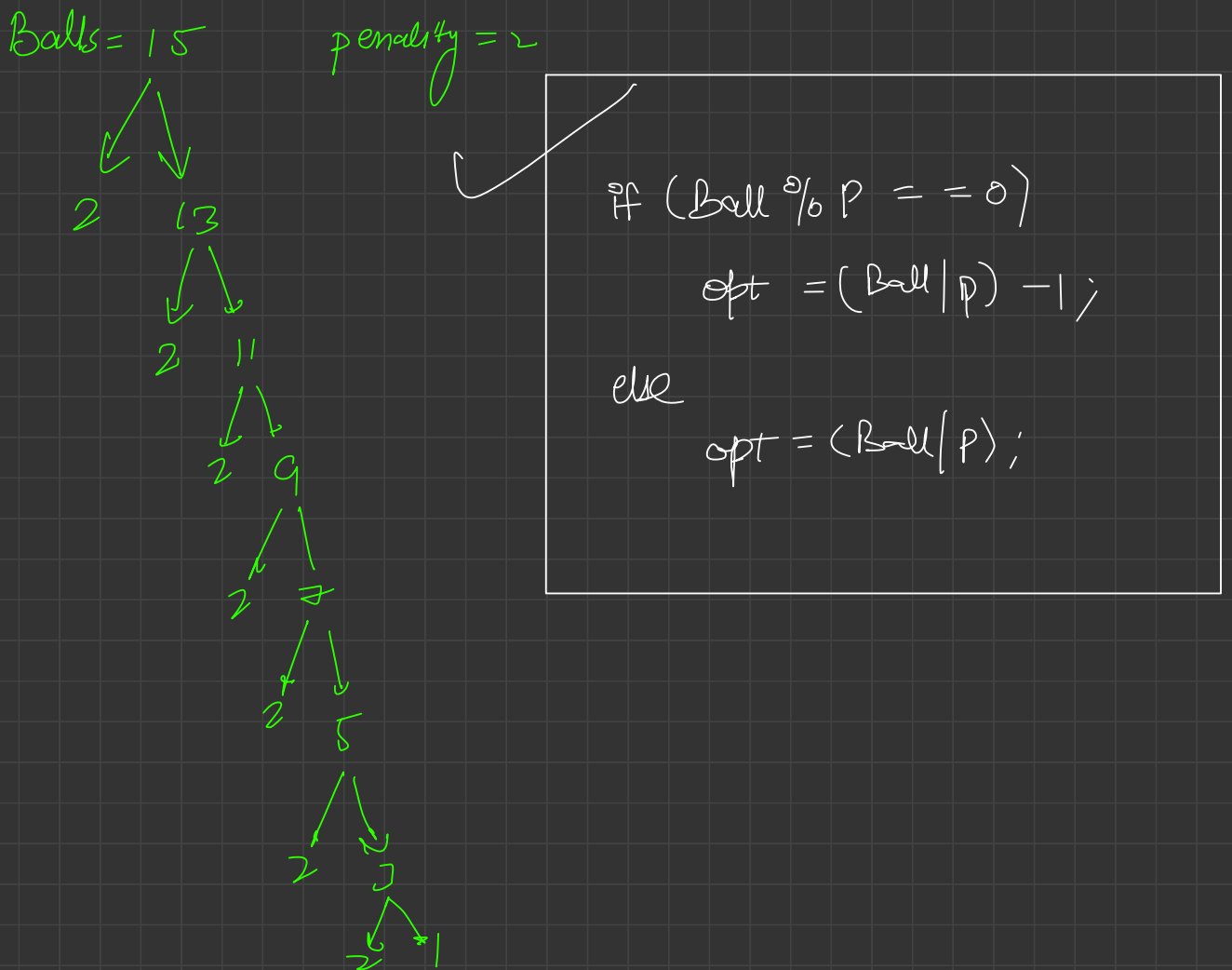
Balls = 10 penality = 2



Balls = 18 penalty = 3



$$Opt = \frac{Balls}{penalty} - 1$$


Balls = 15
penalty = 2
2
13
2
11
2
9
2
7
2
5
2
3
2
1
if (Ball % P == 0)
opt = (Ball/P) - 1;
else
opt = (Ball/P);

$$\log_2(10^2) = 2 \times \log_2 10 \xrightarrow{3.1} \approx 6$$

$$\log_2(10^6) = 6 \times \log_2 10 \xrightarrow{3.1} \approx 18$$