

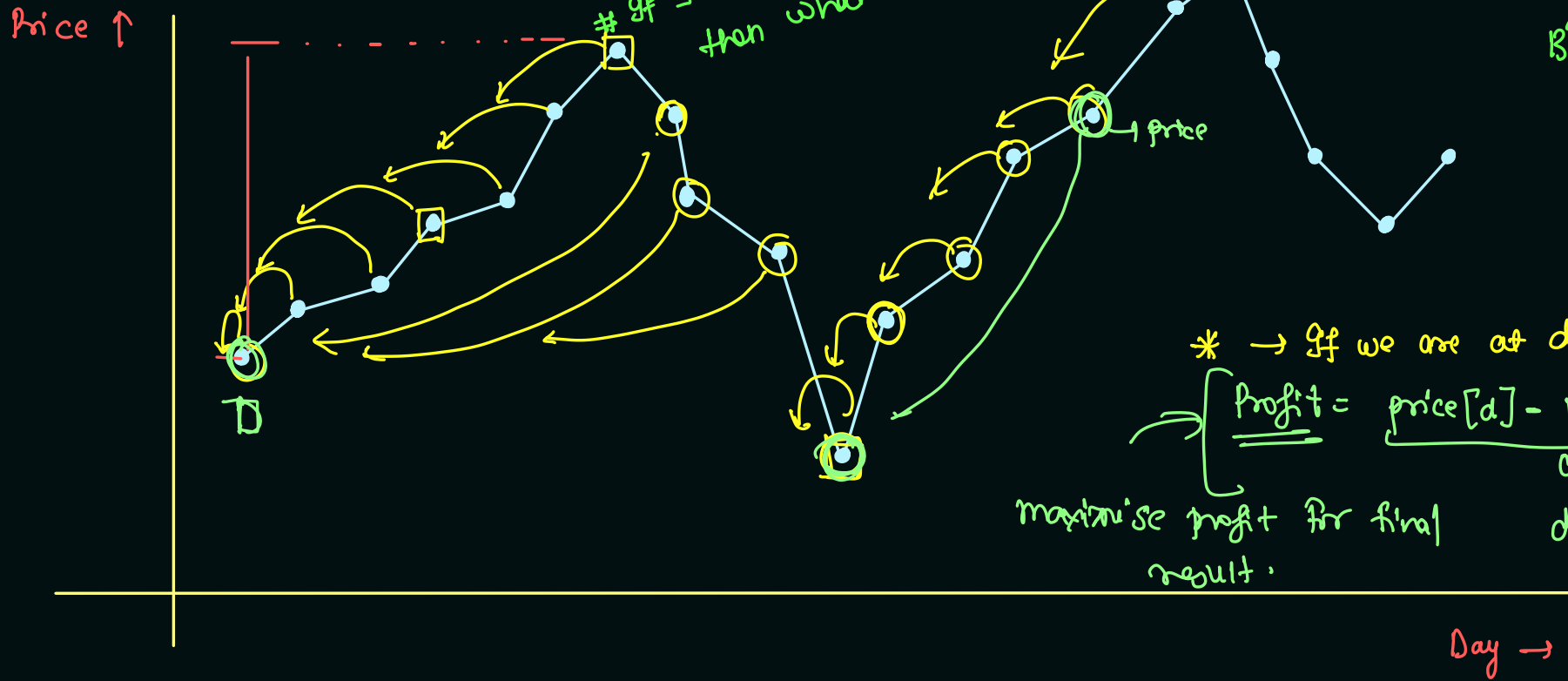
Agenda - 4th Feb 2022

- ✓1. Stock buy and sell - one transaction allowed
- ✓2. Stock buy and sell - Infinite transaction allowed
- ✓3. Stock buy and sell with transaction Fee - Infinite transaction allowed
4. Stock buy and sell with cooldown - Infinite transaction allowed.
5. Stock buy and sell - two transaction allowed
6. Stock buy and sell - k transaction allowed

Stock buy sell - one transaction Allowed :-

→ Single transaction

Buy → Sell



* \rightarrow If we are at day 'd'

$\Rightarrow \underline{\text{Profit}} = \text{price}[d] - \min_{0 \leq i < d} \text{price}[i]$

maximise profit for final dth day result.

Day \rightarrow

Stock Buy sell 2 - Infinite transaction allowed \rightarrow

Buy - sell - Buy - sell

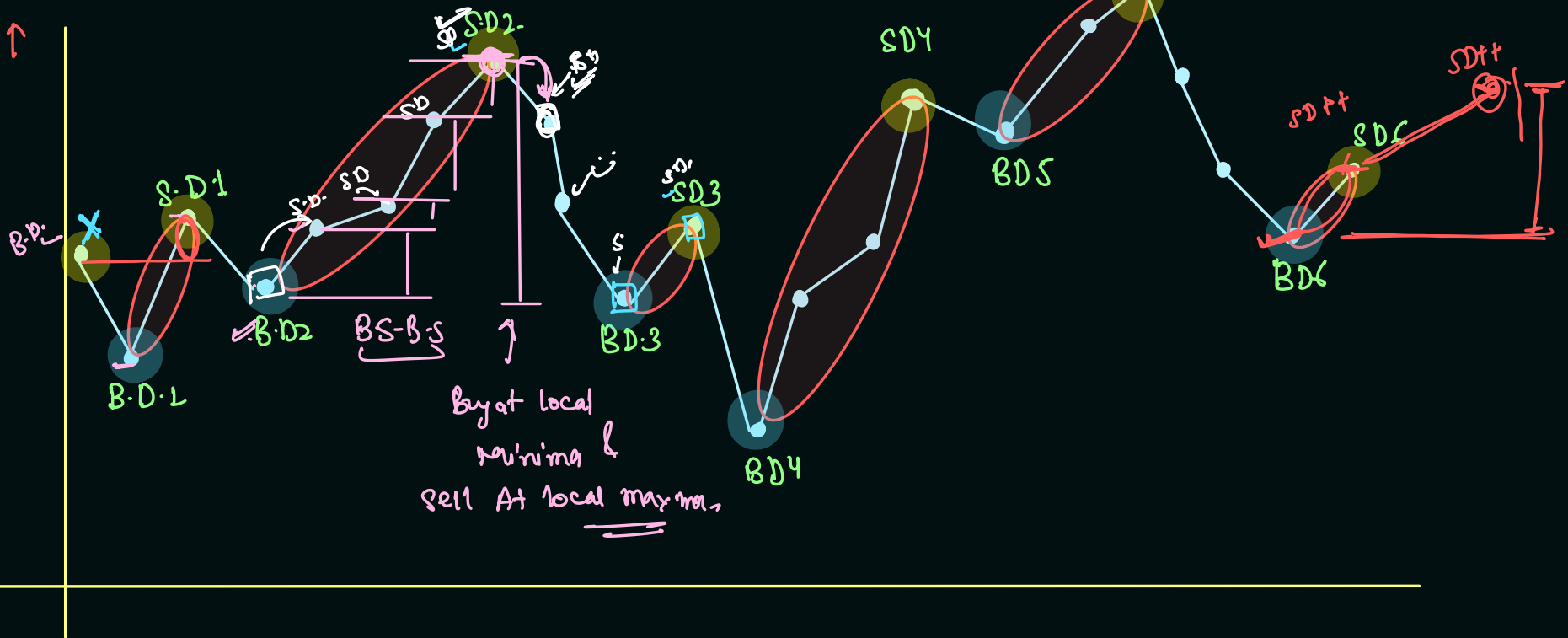
local Minima \rightarrow Buying Day

local Maxima \rightarrow Selling Day

* Add small profit in overall ~~BS-SS~~

* we can hold one stock at a time.

Price \uparrow



Stock Buy and sell with transaction fees - Infinite Transaction :-

Day	Price	Profit if Buy today	Profit if sell today
0	10	-10 \downarrow 50	0
1	15	-10 \downarrow 15-10-3 vs 0 \downarrow 0	0
2	17	-10 \downarrow 2-17-15 vs -10 \downarrow 2	0
3	20	-10 \downarrow 4-20 vs -10 \downarrow 4	0
4	16	-9 \downarrow 7-16 vs -10 \downarrow 7	0
5	18	-9 \downarrow 7-18 vs -9 \downarrow 7	0
6	22	-9 \downarrow 7-22 vs -9 \downarrow 7	0
7	20	-9 \downarrow 10-20 vs -9 \downarrow 10	0
8	22	-9 \downarrow 10-22 vs -9 \downarrow 10	0
9	20	-9 \downarrow 10-20 vs -9 \downarrow 10	0
10	23	-9 \downarrow 10-23 vs -9 \downarrow 10	0
11	25	-9 \downarrow 11-25 vs -9 \downarrow 11	0

Transaction fees = 3
Profit

1. Max. profit we can earn if buy stock in day 3
2. Max. profit we can earn if sell stock in day 6th

-10
vs
-15

Day	Price	profit if Buy today	profit if sell today
0	10	-10 b0	0
1	15	-10 b0	2 b0s1
2	17	-10 b0	4 <u>b0s2</u>
3	20	-10 b0 x ✓	7 b0s3
4	16	-9 b0s3b4	7 b0s3
5	18	-9 <u>b0s3b4</u>	7 <u>b0s3</u>
6	22	-9 b0s3b4	10 <u>b0s3b4s5</u>
7	20	→ + <u>b7</u> ←	↓ last only + (5) + 5 more
8	22		
9	20		
10	23		
11	25		

```

int pibt = -price[0]; // pibt -> profit if buy today
int pist = 0; // initially 0, pist-> profit if sell today

for(int i = 1; i < price.length; i++) {
    int new_pibt = Math.max(pibt, pist - price[i]);
    int new_pist = Math.max(pist, price[i] + pibt - fees);

    pibt = new_pibt;
    pist = new_pist;
}

System.out.println(pist);

```

Stock buy and sell with cooldown: Infinite allowed:

D1 B. D6 S. D7 Cooldown D8, You can buy.
 D9 B. D10 S. D11 Cooldown D12, You can buy.

→

Day	Price	profit if Buy today	profit if sell today	Profit including cool down.
0	10	-10	0	0
1	15	-10	5	0
2	17	-10 vs 0-17 -10	7	5
3	20	-10 vs 5-20 -10	10	7
4	16	-10 vs 7-16 -9	10	10
5	18	1. -8 vs 10-18 -8	3. 10	2. 10
6	22	-8	14	10
7	20	-8	14	14
8	22	-8	14	14
9	20	-6	14	14
10	23	-6	17	14
11	25	-6	19	17

Stock buy sell with 2 transaction allowed :

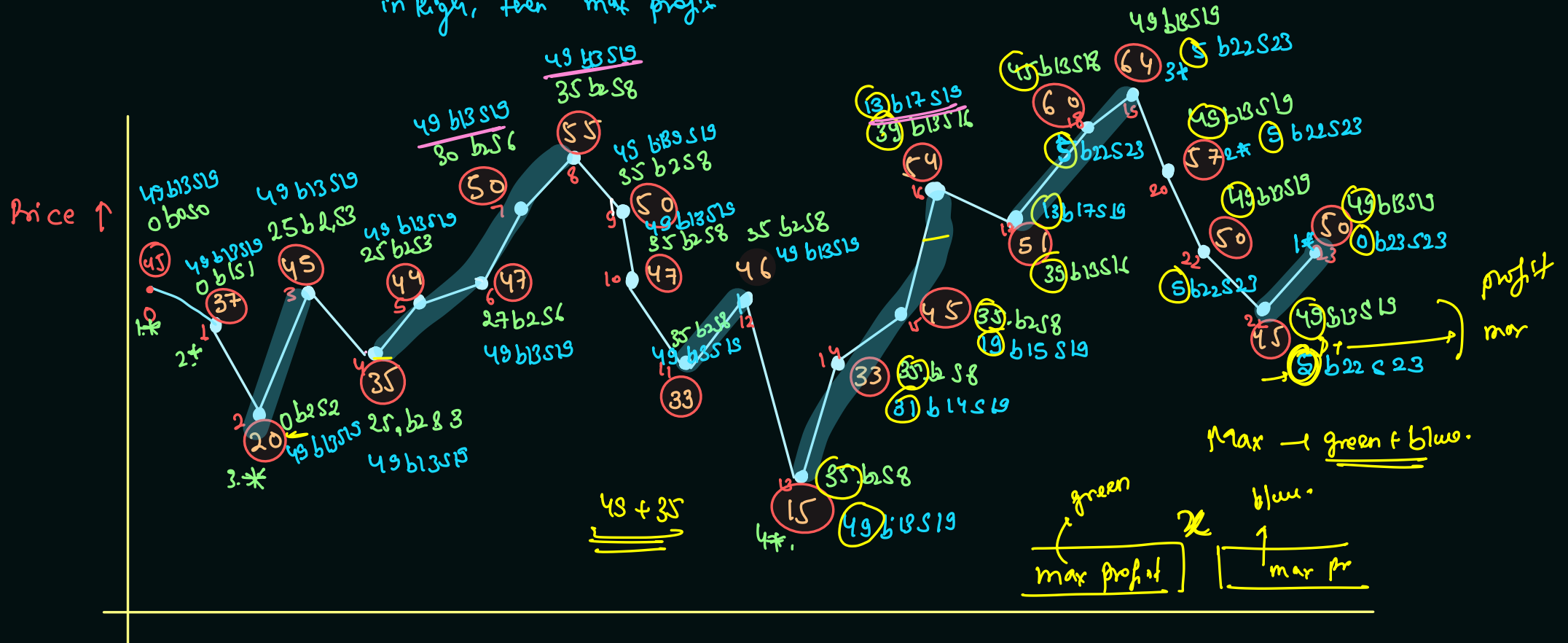
$$\text{profit} = \sum_{i=1}^n (b_i - s_i)$$

max overall profit till now

→ If we sell stock today, max profit

→ If we buy stock today and sell it at max price day in right, then max profit

(2) =



test case

net profit ≥ 0

Set
9

min

9	10	11	13	5	7	8	9	10	8	<div>3 10</div>
0	1	2	3	4	5	6	7	8	9	
0	0	0	0	4	4	4	0	1	4	10
↓										
0	1	2	3	0	1	2	7	7	5	0

max Right

Homeworks