CLASS 3

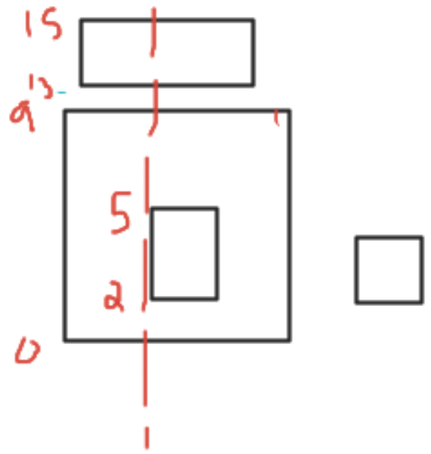
Work until 11:35

Will cover #2 right afterward

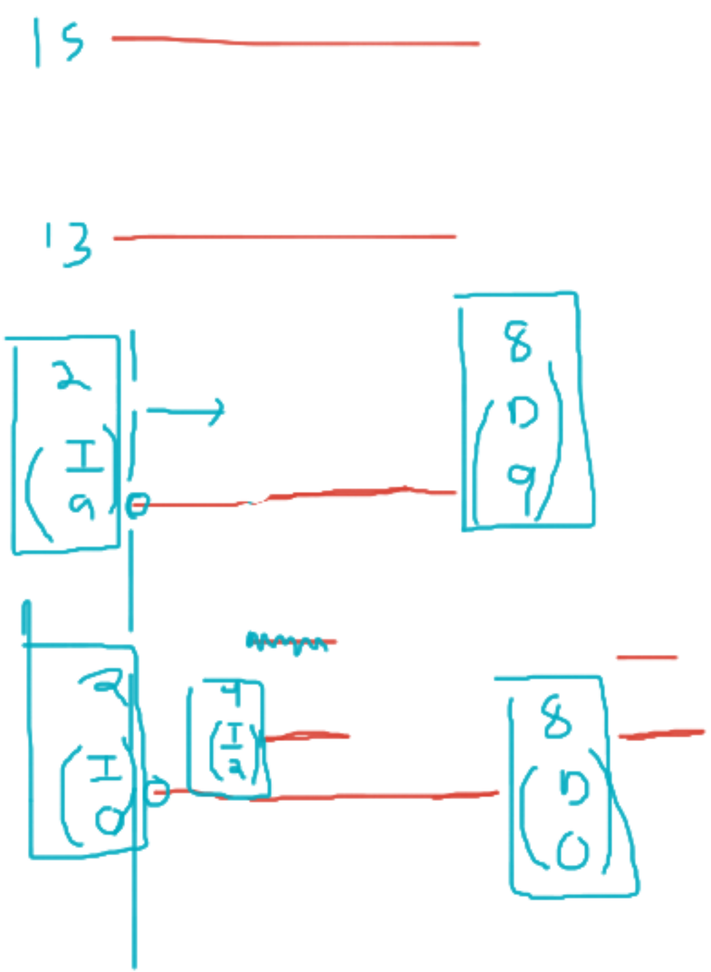
Break 1:	10:30 AM - 10:45 AM
Lunch:	12:15 PM - 1:30 PM
Break 2:	3:00 PM - 3:15 PM
End:	4:45 PM

2. Farm Painting

SAMPLE INPUT:
3
2 0 8 9
10 2 11 3
4 2 6 5

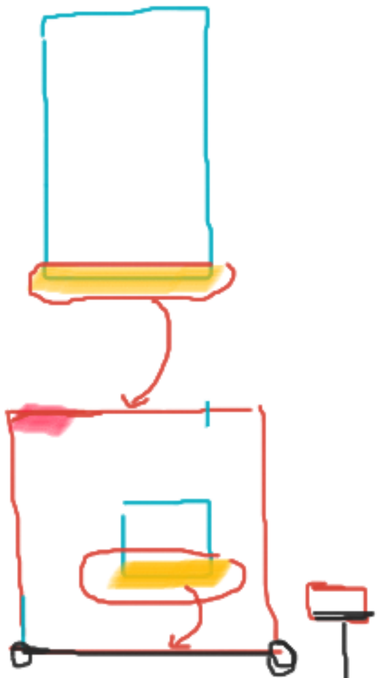


[(0, 9), (13, 15)]



0 < 2 and 5 < 9

0 < 2 and 2 < 9



Set

2 (0, 9), (13, 15)

4

3. Radio Contact

SAMPLE INPUT:

2 7
3 0
5 0
NN
NWWWWWN

Options:

1. Bessie Moves ONLY
2. FJ Moves ONLY
3. Both Move

```
if (dp[a][b] != -1)
    return dp[a][b]
```

min_cost(a, b)

a = # of steps by FJ
b = " " by Bessie

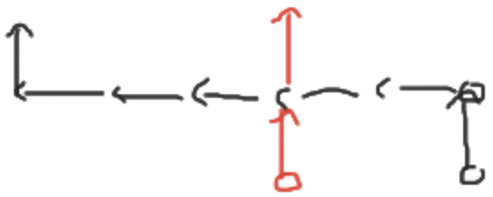
```
ans = e(posFJ(a), posB(b))
if a == N and b == M:
    return ans
best = ∞
if a < N:
    best = min(best, min_cost(a+1, b))
if b < M:
    best = min(best, min_cost(a, b+1))
if a < N and b < M
    best = min(best, m_c(a+1, b+1))
dp[a][b] = best + ans
return best + ans
```

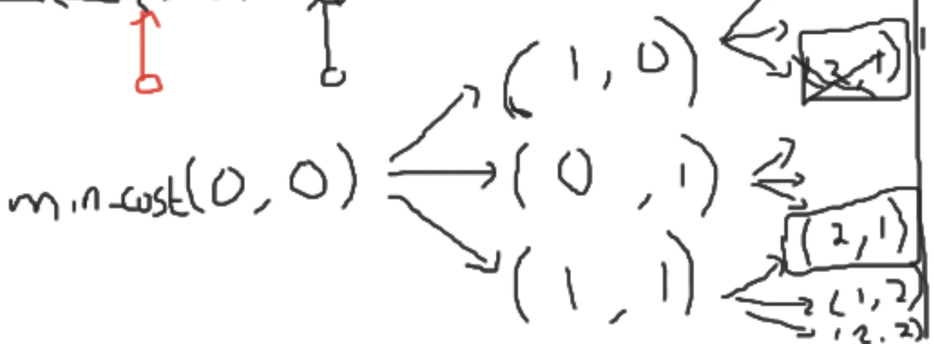
O(NM)

posFJ: [(3,0), (3,1), (3,2)]

posB: [(5,0), (5,1), (4,1) . . .]

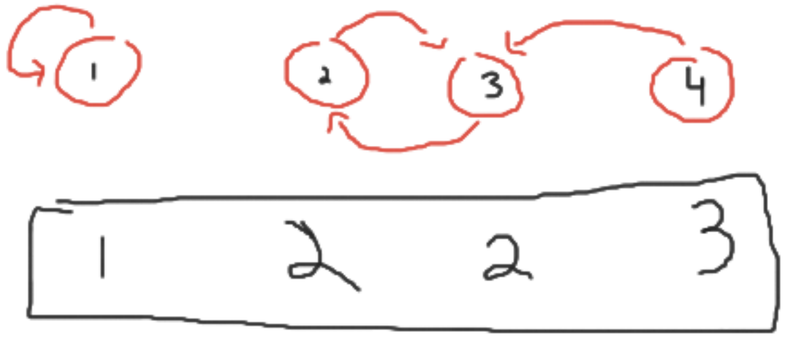
e(A,B) = square dist

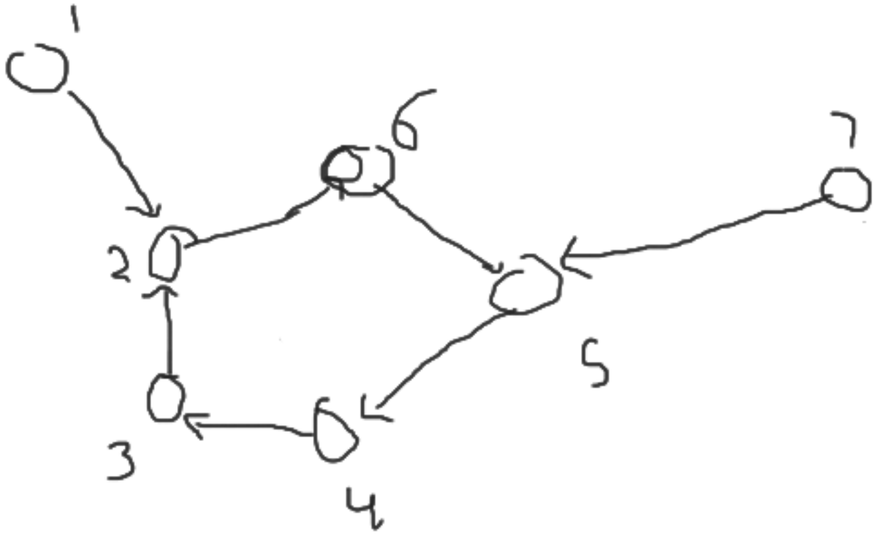


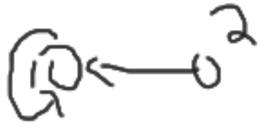


5.Trick or Treat on the Farm

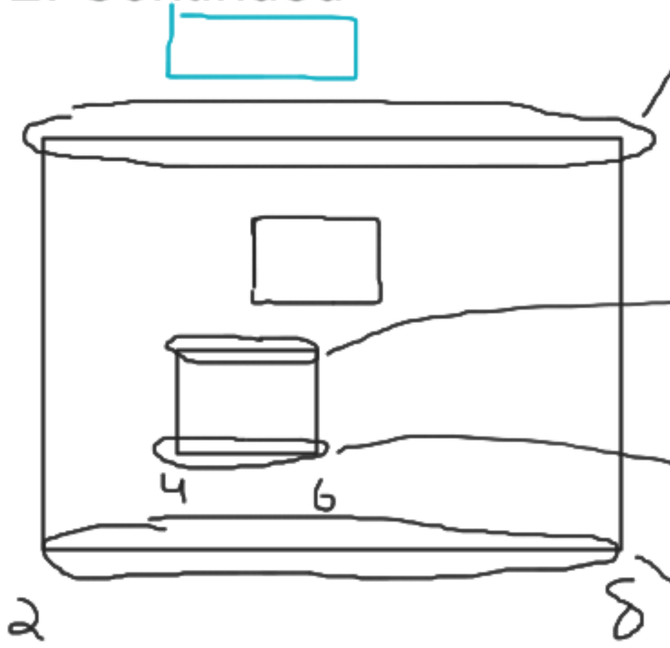
SAMPLE INPUT:







2. Continued



Q(I, 2, 9, top)
Q(D, 8, 9, top)

Q(I, 4, 5, top)
Q(D, 6, 5, top)

Q(I, 4, 2, bot)
Q(D, 6, 2, bot)

Q(I, 2, 0, bot)
Q(D, 8, 0, bot)

Query

type ∈ {Insert, Delete}

x-coord

y-coord

pos ∈ {bot, top}

Line

(y-coord, pos)

x	S
0	{}
2	{ L(0, bot), L(9, top) }
4	{ L(0, bot), L(9, top) }
8	{}

Q(I, 4, 2, bot) | Q(I, 4, 13, bot)

↳ is the line right below a bot line? if yes, then its completely enclosed

1. Create a line (2, bot) (13, bot)
2. Use lower_bound/floor to query whats right below (2, bot)

↳ L(0, bot)

Turns out this is enclosed -> Don't add to s

↳ L(9, top)

turns out, this isn't enclosed -> Do add to S, Add 1 to our answer