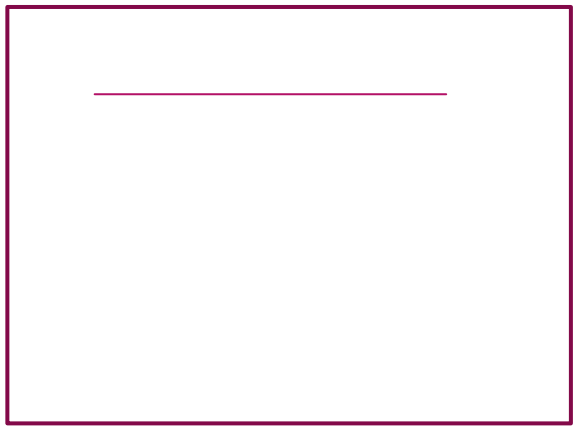
Lab8 Questions

YAO ZHAO

Lab8.A: Yan_ice loves lines

- Yan_ice once dreamed of an infinitely large plane that contained N lines. He surprisingly found that any pairs among these lines did not coincide, and any triples did not intersect at one point. He carefully counted the intersections in his dream, but when he woke up, he suddenly forgot everything.
- Please list the possible number of intersections of the N lines for him.

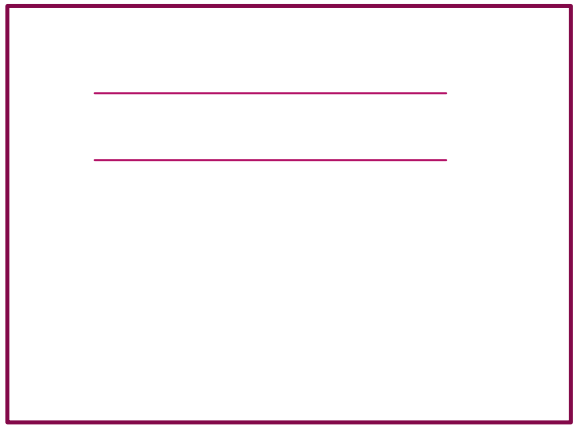
N = 1



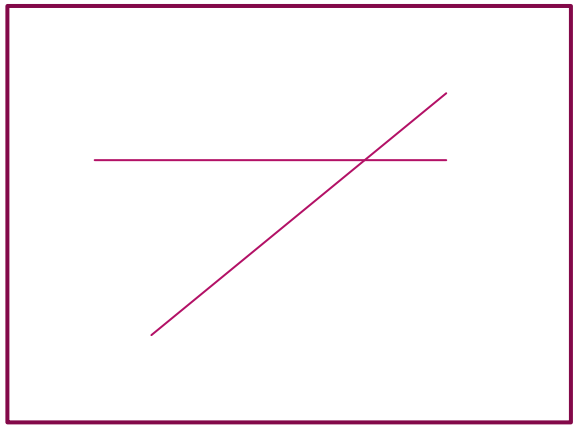
0

possible number of intersections:
0

N = 2



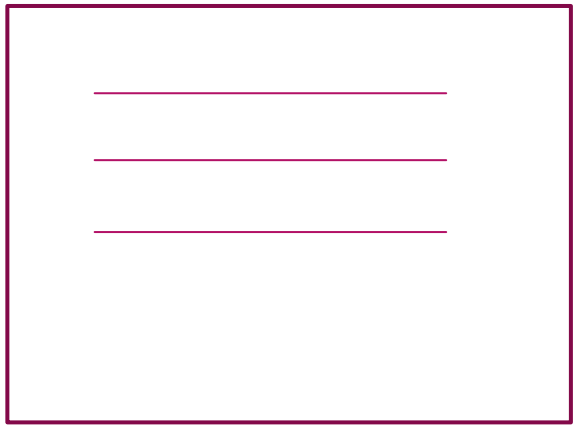
0



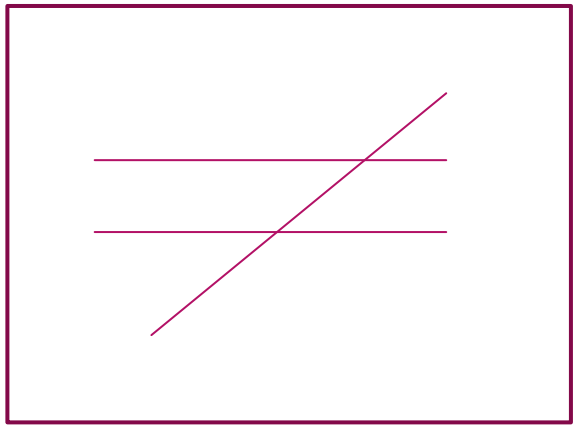
1

possible number of intersections:
0 1

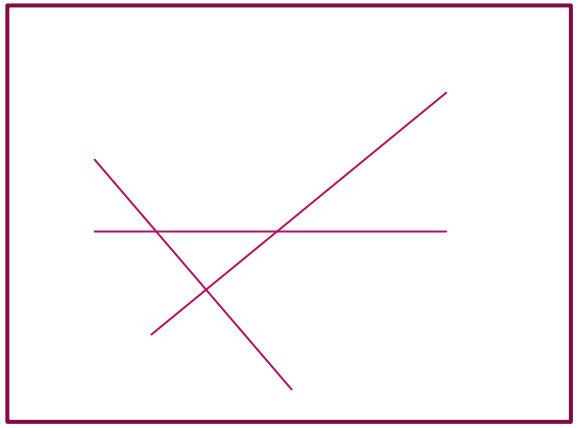
N = 3



0



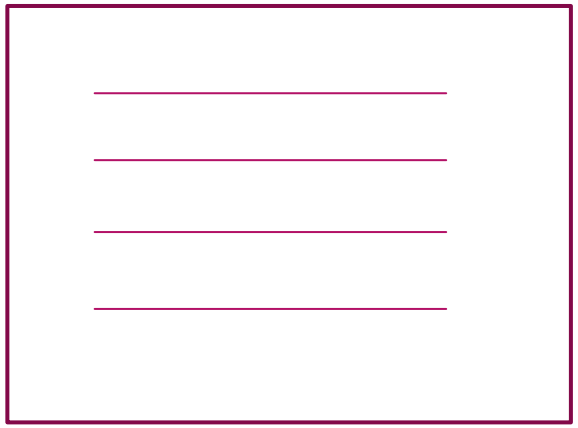
2



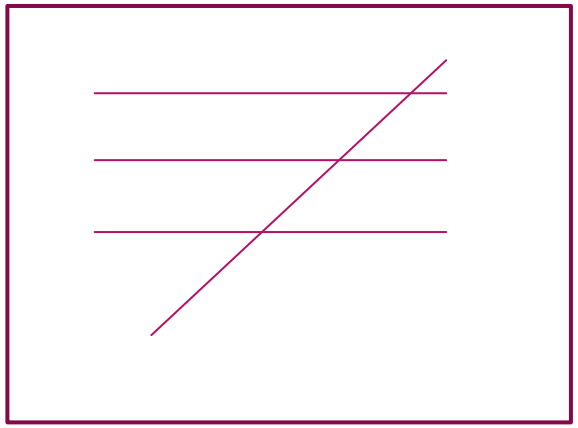
3

possible number of intersections:
0 2 3

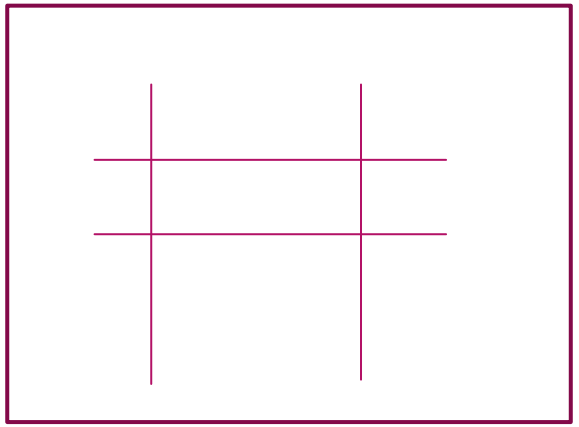
N = 4



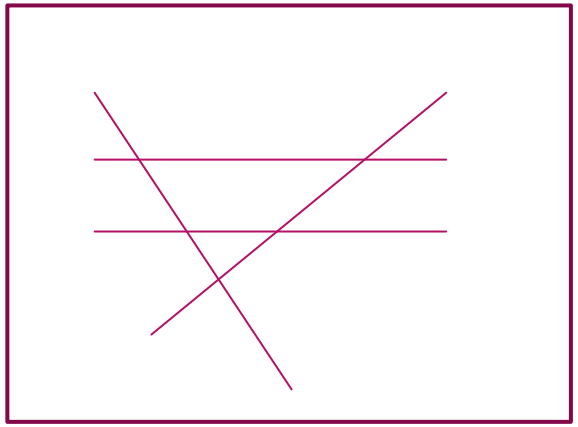
0



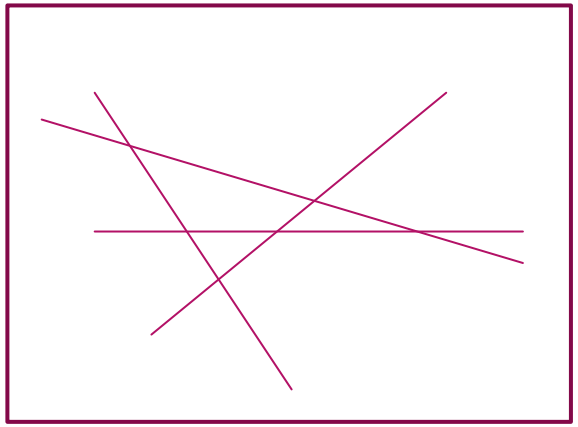
3



4



5



6

possible number of intersections:
0 3 4 5 6

Lab8.B: Mr. Sorry & Satan

- Mr. Sorry and Satan are two top agents in CRA (Central Rabi Agency). One day CRA detected N bugs in a 2D plane and sent the two agents to destroy them.
- Close as the two agents are, they would accomplish missions separately for greater efficiency. Yet they must reach the coordinate of certain bug to destroy it, and they must destroy the bugs according to the given order (You know some bugs appear only when you wipe out the previous bugs). The energy consumed for each agent equals to the sum of Manhattan distance between every two adjacent coordinates he reach. Please calculate the minimum sum of energy consumed by the two agents.

Sample Input 1

3
0 1
1 0
1 1

1st way:
1:(0, 1) → (1, 0)→(1, 1)
2 + 1 =3
null:0
Total: 3+0 = 3

2nd way:
1:(0, 1) → (1, 0)
2
2: (1, 1)
Total: 2+0 =2

3rd way:
1: (0, 1) → (1, 1)
1
2: (1, 0)
Total: 1+0 =1

get minimum

Sample Output 1

1

Sample Input 2

4
1 0
9 8
3 2
5 9

1st way:
1:(0, 1) → (9, 8)→(3, 2)→(5, 9)
16 + 16 + 9 = 32
null:0
Total: 33+0 = 32

2nd way:
1:(0, 1)
2:(9, 8)→(3, 2)→(5, 9)
16 + 9
Total: 16 + 10 = 25

4th way:
1:(3, 2)
2:(0, 1)→(9, 8)→(5, 9)
16 + 5
Total: 16 + 10 = 21

3rd way:
1: (9, 8)
2: (0, 1) →(3, 2)→(5, 9)
4 9
Total: 4+9 =13

5th way:
1: (5, 9)
2: (0, 1) →(9, 8)→(3, 2)
16 16
Total: 16+16 =32

6th way:

1:(0, 1) →(9, 8)

16

2:(3, 2)→(5, 9)

9

Total: 16 + 9 = 25

7th way:

1:(0, 1) →(5, 9)

13

2:(9, 8)→(3, 2)

12

Total: 13 + 12 = 25

8th way:

1: (0, 1) →(3, 2)

4

2: (9, 8) →(5, 9)

5

Total: 4+5 =9

Sample Output 2

9