	KMIT – NIRANTHAR	
	Season-1	
KMIT-NFS-1004	Programming Assignments	Tuesday 15th OCT 2019

## 1 EstherNumberLine

Esther is in KinderGarten and is now learning about number line. Given 2 numbers (interval) she draws a line from the first integer to the second one. Given sets (each set is a pair of two) of integers she draws multiple lines on the number line. Once done, she gives her teacher the merged line.

For example: Given (2,5) and (3,8) are the interval sets. she gives her teacher (2,8) as the merged line's starting and ending point. Write a program helping Esther's teacher to figure out the merged line given the intervals or pairs of start and end points.

Note: The values of pair should be in ascending order.

## Input/Output

Input	Output	Comments
2	28	Input:
25		Line 1 - Represents number of pairs
38		Line 2 & 3 - Values of each pair
		Explanation:
		As the second pair starting interval value lies in
		between the interval values of first pair.
		The merged interval value is 2 8
		→ Required output
4	12	Explanation:
12	3 4	The first and Third pair of values on number line
5 10	5 11	will not coincide with any other pair.
3 4		But As the fourth pair starting interval value lies in
7 11		between the interval values of second pair.
		The merged interval value is 5 11
		Hence the merged line interval pairs are 1 2
		3 4
		5 11

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# 2. Abhijeet the Robot

Mr.Banerjee has built a robot named Abhijeet and would like to test it out at a RobotCombat (Robot fight). The combat area, is a square grid plane. The robot, Abhijeet, is initially placed at the origin of the plane, or (0,0) position.

In one second Abhijeet can either move forward by 1 unit or move right by 1 unit, or stay still. So from position(p,q), Abhijeet, can spend one second and move to (p+1,q), (p,q+1) or (p,q) After S seconds, the referee sees and reports that Abhijeet lies on or inside the grid/plane of side-length d with coordinates (P,Q), (P+d,Q), (P,Q+d), (P+d,Q+d). Calculate how many points with integer coordinates on or inside this square could be Abhijeet's position after exactly S seconds.

#### Input:

The first and only line of input contains four space-separated integers: P, Q, d, and S.

#### **Output:**

Print the number of points with integer coordinates that could be the Abhijeet's position after S seconds.

#### **Constraints:**

0<= P,Q <= 100 1<=d<=100 0<=S<=400

### Input/Output

Input Out	Comments
3 3 4 7 3	Abhijeet possible positions on/inside grid is 3  Explanation:

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		Initially abhijeet is at (0,0)	
		To reach (3,3) abhijeet takes 6 seconds- 1point	
		(3,4) takes 7 seconds - 2points	
		(3,5) takes 8 seconds - exceeds the time	
		(3,6) takes 9 seconds - exceeds the time	
		Soon	
		(4,3) takes 7 seconds - 3points	
		(4,4) takes 8 seconds - exceeds the time	
		(4,5) takes 9 seconds - exceeds the time	
		Soon	
		Therefore number of points with integer coordinates that could be	
		the abhijeet's position at and after 7 seconds is 3 points	
5 4 8 11	6	Abhijeet possible positions on/inside grid is 6	
3 4 8 5 0 Abhijeet possible position		Abhijeet possible positions on/inside grid is 0	
		Initially abhijeet is at (0,0)	
		To reach (3,4) abhijeet takes 7 seconds. But the time given is	
		5seconds so he cannot reach.	