

PRACTICE-05_COND-LOOPS

Points on a Plane (p1v1d1)

You will be given the (x,y) coordinates of 4 points in a plane (all coordinates will be integers) X1, X2, P, Q. In the first line of the output, write down the equation of the line formed by the first two points X1 and X2.

Your equation must be of the form

$y = ax + b$

unless the line is a vertical line in which case you should give the equation in the form

$x = c$

The numbers a, b, c must be rounded off to three decimal places. In the next line, write down one of the following labels depending on how the points P and Q behave with respect to the line you just constructed.

1. **Both On The Line** if both points P and Q lie on the line
2. **One On The Line** if one point is on the line and the other is not on the line
3. **Together** if P and Q lie on the same side of the plane but none are on the line
4. **Apart** if P and Q are on different sides of the plane but none are on the line

EXAMPLE:

INPUT

(0, 1) (2, 3) (10, 10) (20, 21)

OUTPUT

$y = 1.000x + 1.000$

One On The Line

All Test Cases (Visible + Hidden)

Input	Output
(0, 1) (2, 3) (10, 10) (20, 21)	$y = 1.000x + 1.000$ One On The Line
(-1, 1) (-1, 2) (1, 1) (2, 1)	$x = -1.000$ Together
(1, 3) (-1, -1) (0, 0) (-10, 10)	$y = 2.000x + 1.000$ Apart
(1, 2) (-2, -7) (0, -1) (-10, -31)	$y = 3.000x - 1.000$ Both On The Line
(100, 2) (-200, 3) (0, 0) (10, 5)	$y = -0.003x + 2.333$ Apart
(100, 2) (100, 3) (100, 0) (10, 5)	$x = 100.000$ One On The Line

A Tale of Two Circles (p1v2d1)

Given two circles in the format (x, y, r) where (x, y) is the center and r is the radius (all quantities will be integers), you have to decide which one of the following tags applies to these two circles and print that tag.

1. **Intersect** The two circles intersect
2. **Tangent External** The two circles are tangential externally
3. **Enclose** One circle encloses the other
4. **Tangent Internal** The two circles are tangential internally
5. **Disjoint** The two circles are disjoint

You can assume that the two circles will either have different centers or else have different radii. However, they may have the same center and different radii or else different centers and same radius.

All Test Cases (Visible + Hidden)

Input	Output
(0,0,2) (1,0,1)	Tangent Internal
(0,0,2) (1,0,2)	Intersect
(0,0,2) (0,3,1)	Tangent External
(-1,-1,2) (3,3,1)	Disjoint
(-1,-1,20) (3,3,1)	Enclose
(-1,-1,20) (-1,-1,30)	Enclose

Build a Rhombus Revisited (p1v3d1)

You will be given 2 integers, m and n. m will always be single digit and non-negative but n need not be single digit. However, n will always be greater than or equal to 1. You have to build the rhombus shape you built in week 2 using the digit m but now the size of the rhombus will be given by n.

EXAMPLE

INPUT

1 3

OUTPUT

```
1
11
111
111
11
1
```

INPUT

2 5

OUTPUT

```
2
22
222
2222
22222
22222
2222
222
22
```

All Test Cases (Visible + Hidden)

Input	Output
1 3	1 11 111 111 11 1
2 5	2 22 222 2222 22222 22222 2222 222 22 2
0 6	0 00 000 0000 00000 000000 000000 00000 0000 000 00 0
9 4	9 99 999 9999 9999 999 99 9

Hello World Revisited (p1v4d1)

Write a program to read a positive integer n and print "Hello World" (without quotes) n times on n different lines.

All Test Cases (Visible + Hidden)

Input	Output
1	Hello World

3	Hello World
	Hello World
	Hello World
6	Hello World
	Hello World
	Hello World
	Hello World
	Hello World
	Hello World
0	

Crescendo (p1v5d1)

Write a program to take a positive integer greater than or equal to 1 and print the following pattern. Be very careful about not having extra spaces at the end of every line.

INPUT

3

OUTPUT

1
1 2
1 2 3

INPUT

5

OUTPUT

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5

All Test Cases (Visible + Hidden)

Input	Output
1	1
2	1 1 2
5	1 1 2 1 2 3 1 2 3 4 1 2 3 4 5
7	1 1 2 1 2 3 1 2 3 4 1 2 3 4 5 1 2 3 4 5 6 1 2 3 4 5 6 7

