

# Final Python Assignment



Congratulations! Hopefully, you have now familiarised yourself with the Python programming language. Time well spent!

Python isn't going anywhere. It will continue to be a language used to solve problems in applications ranging from web design to scientific research. If you continue studies in Computer Programming this won't be the last time you see Python.

Before we move on to the fundamentals of web programming, you must complete the following two tasks to prove your "Python Powers"

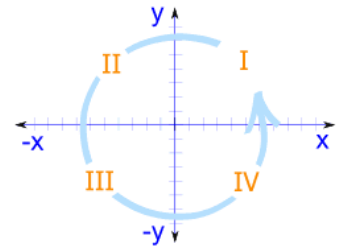
Once you have completed the solution to each problem you must:

1. Show me your working product
2. Show one other member of class your working product.
3. Print out your code with comments that clearly explains what the code does and what each section of code is doing.

Good Luck.

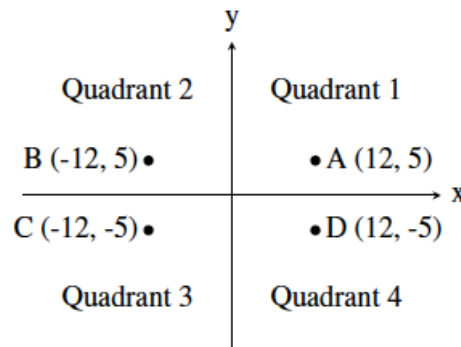


# Problem#1 Quadrant Identification:



## Problem Description

A common problem in mathematics is to determine which quadrant a given point lies in. There are four quadrants, numbered from 1 to 4, as shown in the diagram below:



For example, the point A, which is at coordinates (12, 5) lies in quadrant 1 since both its  $x$  and  $y$  values are positive, and point B lies in quadrant 2 since its  $x$  value is negative and its  $y$  value is positive.

Your job is to take a point and determine the quadrant it is in. You can assume that neither of the two coordinates will be 0.

## Input Specification

The first line of input contains the integer  $x$  ( $-1000 \leq x \leq 1000; x \neq 0$ ). The second line of input contains the integer  $y$  ( $-1000 \leq y \leq 1000; y \neq 0$ ).

## Output Specification

Output the quadrant number (1, 2, 3 or 4) for the point  $(x, y)$ .

## Sample Input 1

12  
5

## Output for Sample Input 1

1

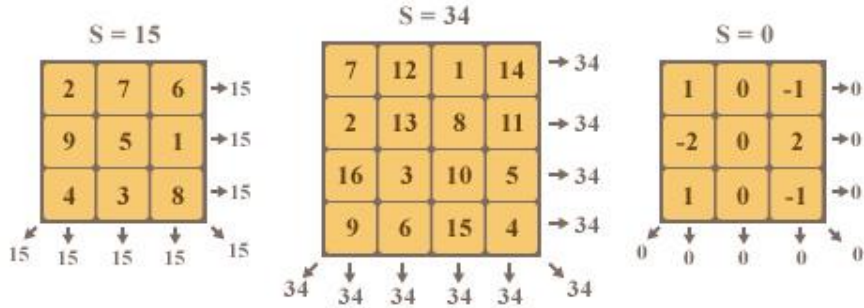
## Sample Input 2

9  
-13

## Output for Sample Input 2

4

## Problem#2 Magic Squares:



### Problem Description

Magic Squares are square arrays of numbers that have the interesting property that the numbers in each column, and in each row, all add up to the same total.

Given a  $4 \times 4$  square of numbers, determine if it is magic square.

### Input Specification

The input consists of four lines, each line having 4 space-separated integers.

### Output Specification

Output either `magic` if the input is a magic square, or `not magic` if the input is not a magic square.

### Sample Input 1

```
16 3 2 13
5 10 11 8
9 6 7 12
4 15 14 1
```

### Output for Sample Input 1

```
magic
```

### Explanation for Output for Sample Input 1

Notice that each row adds up to 34, and each column also adds up to 34.

### Sample Input 2

```
5 10 1 3
10 4 2 3
1 2 8 5
3 3 5 0
```

### Output for Sample Input 2

```
not magic
```

### Explanation for Output for Sample Input 2

Notice that the top row adds up to 19, but the rightmost column adds up to 11.