Problem A. Arm-Strong Number

Run Time Limit: 1 sec

An Armstrong number of three digits is an integer such that the sum of the cubes of its digits is equal to the number itself. For example, 371 is an Armstrong number since 3*3*3 + 7*7*7* +1*1*1 = 371. In this problem, you needs to test the given three-digit integer is Armstrong number or not.

Input: The first line of input contains a positive integer T (T<80) which denotes the number of test cases. The integer in each following T lines indicates the input three-digit integer for each respective test case.

Output: The output must be 1 for Armstrong input and 0 for not.

Input	*Output*
3 371 394 407	1 0 1

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Problem B. Twin Prime Numbers

Run Time Limit: 1 sec

Twin prime number is the two prime numbers with different two. For example, 3 and 5, 5 and 7, 11 and 13, 17 and 19 are twin prime numbers. In this problem, you needs to find how many twin prime numbers between the given two numbers.

Input: The first line of input contains a positive integer T (T<80) which denotes the number of test cases. The two integer in each test case indicates the start and end number.

Output: The output must be the number of twin primes between start and end number. For example, there are four twin primes (3-5, 5-7, 11-13, 17-19) between 3 and 20 of the first test case.

Input	*Output*
2 3 20 100 900	4 27

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Problem C. Right Triangle

Run Time Limit: 1 sec

Pythagoras' theorem is a very useful theorem to test whether the given triangle is right triangle or not. By using this theorem, $a^2 + b^2 = c^2$, you needs to test the given triangle is right or not using the values of three sides of this triangle.

Input: The first line of input contains a positive integer T (T<80) which denotes the number of test cases. The three integer in each test case indicates the sides of triangle.

Output: The output must be 1 for right triangle and 0 for not.

Input	*Output*
3 10 8 9 5 3 4 1 2 3	0 1 0

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Problem D. Matrix Multiplication

Run Time Limit: 2 sec

The problem is to find the product of two matrices and then compute the power of the product matrix. If the dimensions of the input matrices are impossible to multiply them, please show the result like "Invalid Input Matrix".

Input: The first line is the number of row and column of the first matrix. The next line consists of the values of the first matrix. The third line is the number of row and column of the second matrix. The next line also contains the values of the second matrix. The last line means the number of power (**n**).

Output: Display the product matrix (**M**) and the power of **n** to be calculated. Then, show the result matrix, $\mathbf{M^n}$.

Input	*Output*
2 3 1 2 3 2 2 2 3 2 1 2 1 2 1 2 2	6 12 6 12 Power of 2: 108 216 108 216

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