Homework 4 (Deadline 15:00, April 8, submit your files to TronClass)

Please submit the source code only. The file name should include your student ID number. For example, if your ID number is 406290123, then the file names for problems 1 and 2 should be 406290123_1.txt and 406290123_2.txt, respectively.

1. **Task Description**

   Write a program to print 1 if the three positive integers a, b, and c are valid lengths of a triangle, print 0 otherwise. We can verify the condition by assuring that all a, b, and c are positive, and the sum of any two of them is greater than the third.

   給三個整數 a,b,c 分別代表三角形的邊長。如果能拼成一個三角形，輸出 1，反之輸出 0。判斷三角形是否合法：任兩個邊長和大於第三邊。

   Input Format

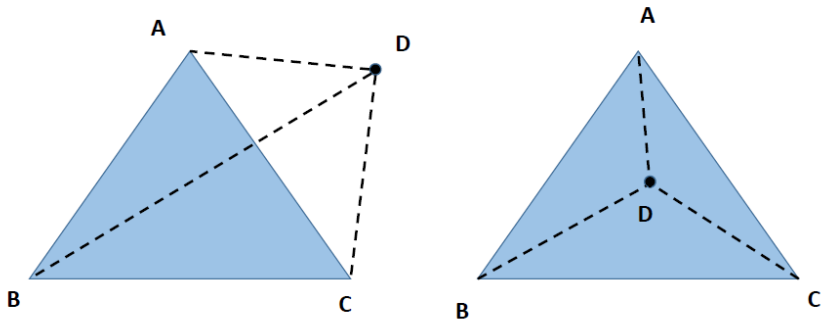
   There are three lines in the input. The first line has the integer a, the second line has the integer b, and the third line has the integer c.

   Output Format

   There are one line in the output. The line has 1 if the lengths are valid, 0 otherwise.

2. **Task Description**

   Ask the user to input the coordinates of 4 points on the xy plane. Determine of these points form a convex quadrilateral (凸四邊形). A simple algorithm is as the following. Use the first three points ABC to form a triangle, if they are not collinear. Compute the sum of the area of these triangles, $\Delta ABD, \Delta BCD, \Delta ACD$, and check if it is larger than the one of ΔABC.



Input format

8 numbers in one line, corresponding to $x_A, y_A, x_b, y_b, x_c, y_c, x_d, y_d$.

Output format

Only one integer appears in one line. If the 4 points do not form a quadrilateral, output an integer 0. If the 4 points form a convex quadrilateral, output an integer 1. If the 4 points form a concave quadrilateral, output an integer 2. Note that these three conditions are mutually exclusive.

3. Task Description

Determine the A and B values for two input numbers. You will be given two numbers, each consisting of 4 different digits from 1 to 9. You should determine two values. The A value is the number of digits that are the same and appear in the same locations. For example, the A value of 1234 and 1253 is two, since both 1 and 2 are the same and they appear in the same locations. The B value is the number of digits that are the same but appear in different locations. For example, the B value of 1234 and 1253 is 1, since 3 appears in both numbers but appear in different locations.

Input Format

Two numbers in a line to determine. Both number are composed of 4 different digits without 0.

Sample Input

1234 1345

Sample output

1A2B