

Matrix with all variants

100x100	101x100	...	....	998x100	999x100
100x101	\\	...	...	//	999x101
...	=	=	...
...	=	=	...
100x998	//	...	...	\\	999x998
100x999	101x999	...	...	998x999	999x999

First, we can remove the same combinations

100x100	101x100	...	....	998x100	999x100
	\\	...	...	//	999x101
		=	...
			...	=	...
				\\	999x998
					999x999

Multiplication of two big numbers will give the bigger number, then two small numbers, so the calculation will be moved from 999 to 100.

$$x + y = 1$$

$$F(x) = x \cdot y = \max - ?$$

$$F(x) = x \cdot (1 - x) = x - x^2$$

$$F'(x) = 1 - 2 \cdot x = 0$$

$$x = \frac{1}{2} \Rightarrow y = \frac{1}{2} \Rightarrow F(x) = \max, \text{ when } x = y$$

so squares are bigger, then multiplication of other similar numbers

That's why algorithm will check squares first. But 998x998 is bigger than 999x100, so after every square, we will check the opposite diagonal, such as on illustration:

			...
...	...	...	999x995
996x996	998x996	998x996	999x996
	997x997	998x997	999x997
		998x998	999x998
			999x999

But, when the decision is founded on this opposite diagonal, the control of squares of smaller numbers is needed.