

**Vedic Multiplication**  
by  
**Rafael Espericueta**

Vedic multiplication starts with a multiplication table of the digits of the two numbers being multiplied. For example, to multiply the numbers  $347 \times 569$ , we construct the following table:

×	5	6	9
3	15	18	27
4	20	24	36
7	35	42	63

The lower right entry in the table, 63, is the product of 7 ones with 9 ones.

Notice that the entries in the yellow diagonal bands of the table are the product of 7 ones with 6 tens, and of 4 tens with 9 ones, so the sum of these entries are the total number of tens (ones times tens equals tens).

The next diagonal up has entries consisting of 7 ones times 5 hundreds, 4 tens times 6 tens, and 3 hundreds times 9 ones. So the sum of these entries is the number of hundreds.

For the remaining two diagonal entries, the powers of ten increment for each subsequent diagonal.

In other words,

$$\begin{aligned}
 347 \cdot 569 &= 15 \cdot 10^4 + (20 + 18) \cdot 10^3 + (35 + 24 + 27) \cdot 10^2 + (42 + 36) \cdot 10^1 + 63 \cdot 10^0 \\
 &= 15 \cdot 10^4 + 38 \cdot 10^3 + 86 \cdot 10^2 + 78 \cdot 10 + 63 = 15 \cdot 10^4 + 38 \cdot 10^3 + 86 \cdot 10^2 + (78 + 6) \cdot 10 + 3 \\
 &= 15 \cdot 10^4 + 38 \cdot 10^3 + 86 \cdot 10^2 + 84 \cdot 10 + 3 = 15 \cdot 10^4 + 38 \cdot 10^3 + (86 + 8) \cdot 10^2 + 4 \cdot 10 + 3 \\
 &= 15 \cdot 10^4 + 38 \cdot 10^3 + 94 \cdot 10^2 + 4 \cdot 10 + 3 = 15 \cdot 10^4 + (38 + 9) \cdot 10^3 + 4 \cdot 10^2 + 4 \cdot 10 + 3 \\
 &= 15 \cdot 10^4 + 47 \cdot 10^3 + 4 \cdot 10^2 + 4 \cdot 10 + 3 = (15 + 4) \cdot 10^4 + 7 \cdot 10^3 + 4 \cdot 10^2 + 4 \cdot 10 + 3 \\
 &= 19 \cdot 10^4 + 7 \cdot 10^3 + 4 \cdot 10^2 + 4 \cdot 10 + 3 = \boxed{197443}
 \end{aligned}$$