In this post, I am going to explain the next combination technique around '過大実乗法' (Multiplication with Excessive multiplicand) called '過大実省一乗法.'

It is useful when the excessive-multiplicand is simpler than the multiplicand itself (as I explained in previous post) AND the initial digit of the multiplier is 1.

The principle:
When calculating A*B, if we add some value 'D' to multiplicand 'A' (the sum is called excessive-multiplicand 'E'), and eliminate the initial digit 1 from multiplier 'B' (let's call it 'M' for modified-multiplier), the expression would be:

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A*B = (E-D) * (10^n + M)
    = 10^n*(E-D) + E*M - D*M
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Since 10^n*(E-D) is on the board (although we have to mentally change the decimal point), all we have to do is add E*M to the board, and subtract D*M from it.

Example: 39698*157=6232586

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ABC  abcdefg
157  39698    : First, eliminate the initial 1 from the multiplier [A].
057  39698    : We are going to process '- D*M' term first,
                so look at the other side of [e], which is 2,
                multiply this value by [B] (5),
                and subtract the result (10) from [ef].
057  39697    : then multiply 2 by [C] (7), and subtract the result (14) from [fg].
057  3969686  : Look at the other side of [c], which is 3,
                multiply this value by [B] (5),
                and subtract the result (15) from [cd].
057  3954686  : then multiply 3 by [C] (7), and subtract the result (21) from [ef].
057  3952586  : And now the process for '+ E*M',
                so look at the top digit [a] (2) and realize
                the excessive multiplicand is 40000,
                multiply 4 by [B] (5) and add the result to [ab].
057  5952586  : then multiply 4 by [C] (7) and add the result to [bc].
057  6232586  : done.
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