Title: New multiplication algorithm.
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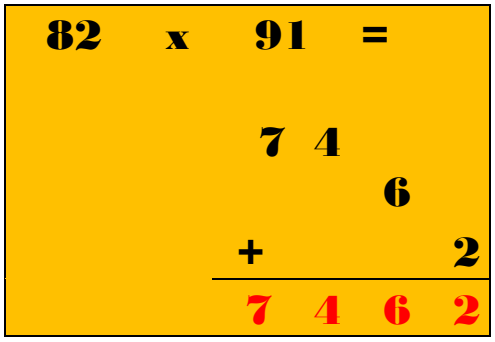
Abstract: This paper develops a new multiplication algorithm that works absolutely with all the numbers.



The 82 would be the multiplicand and the 91 the multiplier, the result is the product.

Demonstration of the functioning of the Algorithm

1) Two digits per one digit.

When we have a single digit in the multiplier it is very simple, we start multiplying by the left and place the numbers in a stepped way to the right.

12 x 5= 60	**35 x 7 = 245**	**891 x 8 = 7.128**
A)5x1 5	A)7x3 2 1	A)8x8 6 4
B)5x2 +1 0	B)7x5 + 3 5	B)8x9 7 2
Product 6 0	Product 2 4 5	c)8x1 + 8
		Product 7 1 2 8

2) Two digits per two digits.

In this case we use the same operation as in the previous example, although the multiplier will start multiplying by the ten and then by the unit. We will also see that when he multiplies the ten he makes a sum and when he multiplies the unit he performs a subtraction. Then multiply both units. We must also take into account the number of the ten, since 9 minus this number gives us a value that will be useful to multiply with the unit of the multiplicand, this result is applied with a final subtraction.

Examples:

The number 5 is what is missing to 4 to reach 9.	The number 6 is what is missing 3 to reach 9.
5 **67 x 42 = 2.814** A) 4x6+7 3 1 B) 2x6-7 5 C) 2x7 + 1 4 Total 3 1 6 4 D) 7x5 - 3 5 ■ Product **2 8 1 4**	6 **59 x 36 = 2.124** A) 3x5+9 2 4 B) 6x5-9 2 1 C) 6x9 + 5 4 Total 2 6 6 4 D) 9x6 - 5 4 ■ Product **2 1 2 4**

The number 0 is what 9 is missing to get to 9	The number 0 is what 9 is missing to get to 9
0 **84 x 91 = 7.644** A)9x8+4 7 6 B)1x8-4 4 C)1x4 + 4 Product **7 6 4 4** There is no subtraction when multiplied by 4 x 0	0 **28 x 93 = 2.604** A) 9x2+8 2 6 B) 3x2-8 -2 C) 3x8 + 2 4 Product **2 6 0 4** There is no subtraction when multiplied by 8 x 0

The number 5 is what the 4 is missing to get to 9.	The number 6 is what is missing 3 to reach 9.
5 **67 x 42 = 2.814** A) 4x6+7 3 1 B) 2x6-7 5 C) 2x7 + 1 4 Total 3 1 6 4 D) 7x5 - 3 5 ■ Product **2 8 1 4**	6 **59 x 36 = 2.124** A) 3x5+9 2 4 B) 6x5-9 2 1 C) 6x9 + 5 4 Total 2 6 6 4 D) 9x6 - 5 4 ■ Product **2 1 2 4**

3) Two digits by three digits

We use the same operation as in the previous examples. We will see that when he multiplies the hundred he makes a sum and when he multiplies the unit he performs a subtraction. When we multiply the ten we only take the result. We must also take into account the number of the ten and the hundred, since 99 minus this number gives us a value that will be useful to multiply with the unit of the multiplicand, this result is applied with a final subtraction.

The number 27 is what is missing at 72 to get to 99.

27

76 x **726** = 55.176

A)	7x7+6	5	5			
B)	2x7		1	4		
C)	6x7-6			3	6	
D)	6x6	+			3	6
Total		5	6	7	9	6
E)	6x27	-	1	6	2	
Product		**5**	**5**	**1**	**7**	**6**

The number 43 is what is missing at 56 to reach 99.

43

76 x **562** = 42.712

A)	5x7+6	4	1			
B)	6x7		4	2		
C)	2x7-6				8	
D)	2x6	+			1	2
Total		4	5	2	9	2
E)	6x43	-	2	5	8	
Product		**4**	**2**	**7**	**1**	**2**

The number 00 is what 99 is missing to get to 99.

00

58 x **996** = 57.768

A)	9x5+8	5	3			
B)	9x5		4	5		
C)	6x5-8			2	2	
D)	6x8	+			4	8
Product		**5**	**7**	**7**	**6**	**8**

E) There is no subtraction

The number 00 is what 99 is missing to get to 99.

00

76 x **991** = 75.316

A)	9x7+6	6	9			
B)	9x7		6	3		
C)	1x7-6				1	
D)	1x6	+				6
Product		**7**	**5**	**3**	**1**	**6**

E) There is no subtraction

4) Three digits by three digits.

We apply the same concepts as in the previous examples, although we must bear in mind that when we have 3 figures in the multiplicand we must take two figures to perform the operation. So the hundred multiplier take the first two units to perform the operation, the same will do the ten and the unit. Finally, the units of both are multiplied.

The number 43 is what is missing at 56 to reach 99.	The number 04 is what 95 is missing to get to 99.

43

128 x 562 = 71.936

A)	5x12+8	6	8			
B)	6x12		7	2		
C)	2x12-8			1	6	
D)	2x8	+			1	6
Total		7	5	3	7	6
E)	8x43	-	3	4	4	■
Product		**7**	**1**	**9**	**3**	**6**

04

348 x 956 = 332.688

A)	9x34+8	3	1	4			
B)	5x34		1	7	0		
C)	6x34-8			1	9	6	
D)	6x8	+				4	8
Total		3	3	3	0	0	8
E)	8x4	-			3	2	■
Product		**3**	**3**	**2**	**6**	**8**	**8**

4) Three digits by four digits

The number 145 is what 854 is missing to reach 999.	The number 054 is what 945 lacks to reach 999.

145

348 x 8.541 = 2.972.268

A)	8x34+8	2	8	0				
B)	5x34		1	7	0			
C)	4x34			1	3	6		
D)	1x34-8					2	6	
E)	1x8	+						8
Total		2	9	8	3	8	6	8
F)	8x145	-		1	1	6	0	■
Product		**2**	**9**	**7**	**2**	**2**	**6**	**8**

054

348 x 9.458 = 3.291.384

A)	9x34+8	3	1	4				
B)	4x34		1	3	6			
C)	5x34			1	7	0		
D)	8x34-8				2	6	4	
E)	8x8	+					6	4
Total		3	2	9	5	7	0	4
F)	8x54	-			4	3	2	■
Product		**3**	**2**	**9**	**1**	**3**	**8**	**4**

5) Three digits by five digits.

The number 1254 is what it lacks to 8745 to reach 9999.	The number 0087 is what 9912 lacks to reach 9999.
1254	0087
125 x **87.458** = 10.932.250	**875** x **99.125** = 86.734.375
A) 8x12+5 = 1 0 1	A) 9x87+5 = 7 8 8
B) 7x12 = 8 4	B) 9x87 = 7 8 3
C) 4x12 = 4 8	C) 1x87 = 8 7
D) 5x12 = 6 0	D) 2x87 = 1 7 4
D) 8x12-5 = 9 1	D) 5x87-5 = 4 3 0
E) 8x5 = 4 0	E) 5x5 = 2 5
Total = 1 0 9 9 4 9 5 0	Total = 8 6 7 3 8 7 2 5
F) 5x1254 = - 6 2 7 0	F) 5x87 = - 4 3 5
Product = **1 0 9 3 2 2 5 0**	Product = **8 6 7 3 4 3 7 5**

6) Four digits by five digits.

The number 8843 is what it lacks to 1156 to reach 9999.
8843
1985 x **11.562** = 22.950.570
A) 1x198+5 = 2 0 3
B) 1x198 = 1 9 8
C) 5x198 = 9 9 0
D) 6x198 = 1 1 8 8
D) 2x198-5 = 3 9 1
E) 5x2 = + 1 0
Total = 2 3 3 9 2 7 2 0
F) 5x8.843 = - 4 4 2 1 5
Product = **2 2 9 5 0 5 7 0**

7) Decimal numbers

It is solved in the same way as the previous cases, to locate the comma we count the decimal places of both numbers and add them as in the traditional multiplication method.

998

1985 x 0,012 = 23,82

A)	0x198+5	5				
B)	0x198		0			
C)	1x198	1	9	8		
D)	2x198-5		3	9	1	
E)	5x2				1	0
		7	3	7	2	0
F)	5x998	4	9	9	0	
Product		**2**	**3**	**,8**	**2**	**0**

998

17,34 x 0,012 = 0,20808

A)	0x173+4	4				
B)	0x173		0			
C)	1x173	1	7	3		
D)	2x173-4		3	4	2	
E)	2x4					8
		6	0	7	2	8
F)	4x998	3	9	9	2	
Product		**,2**	**0**	**8**	**0**	**8**

8) Two ways to solve the same account

We can solve the operations in two ways, which we have been developing in the previous examples or with the alternative method. The alternative method aims to save us the job of having to do auxiliary accounts with large numbers and integrate them into a single account. But you have to pay attention on how to locate them so as not to make mistakes.

Example 1

Natural method

Here we resolve it as I have shown throughout the document.

04

348 x 956 = 332.688

A)	9x34+8		3	1	4		
B)	5x34			1	7	0	
C)	6x34-8				1	9	6
D)	6x8	+				4	8
Total			3	3	3	0	0	8
e)	8x4	-				3	2
	Product		**3**	**3**	**2**	**6**	**8**	**8**

Alternative Method

Here we apply the same technique but we do not take the first two digits as in the previous case. Let's multiply digit by digit.

04

348 x 956 = 332.688

A)	9x3		2	7			
B)	9x4+8			4	4		
C)	5x3			1	5		
D)	5x4				2	0	
D)	6x3				1	8	
e)	6x4-8					1	6
F)	6x8	+				4	8
		3	3	3	0	0	8
G)	8x4	-				3	2
	Product	**3**	**3**	**2**	**6**	**8**	**8**

Example 2

Natural method	Alternative Method
Here we resolve it as I have shown throughout the document.	Here we apply the same technique but we do not take the first two digits as in the previous case. Let's multiply digit by digit.

Natural method

01

253 x **981** = 248.193

A)	9x25+3		2	2	8		
B)	8x25			2	0	0	
C)	1x25-3					2	2
D)	1x3	+					3
Total			2	4	8	2	2	3
E)	3x1	-					3
	Product		**2**	**4**	**8**	**1**	**9**	**3**

Alternative Method

01

253 x **981** = 248.193

A)	9x2		1	8			
B)	9x5+3			4	8		
C)	8x2			1	6		
D)	8x5				4	0	
D)	1x2					2	
E)	1x5-3						2
F)	1x3	+					3
Total			2	4	8	2	2	3
G)	3x1	-					3
	Product		**2**	**4**	**8**	**1**	**9**	**3**

9) Decomposition of natural method multiplications

01

253 x **981** = 248.193

A)	9x25+3		2	2	8		
B)	8x25			2	0	0	
C)	1x25-3					2	2
D)	1x3	+					3
Total			2	4	8	2	2	3
E)	3x1	-					3
	Product		**2**	**4**	**8**	**1**	**9**	**3**

$$253x\ 981 = [(9x25 + 3)x1000 + (8x25)x100 + (1x25 - 3)x10 + (1x3)x1] - (3x1)x10$$

$$253x\ 981 = (228.000 + 20.000 + 220 + 3) - 30$$

$$253x\ 981 = 248.193$$

It is multiplied by 1000 since the 981 has three digits, for each digit a 0.
The final subtraction is always multiplied by 10 in all cases.

145

348 x **8.541** = 2.972.268

A)	8x34+8		2	8	0			
B)	5x34			1	7	0		
C)	4x34				1	3	6	
D)	1x34-8						2	6
E)	1x8	+						8
Total			2	9	8	3	8	6	8
F)	8x145	-			1	1	6	0
	Product		**2**	**9**	**7**	**2**	**2**	**6**	**8**

Decomposition

$$348x\ 8.541 =$$

$$[(8x34 + 8)x10.000 + (5x34)x1.000 + (4x34)x100 + (1x34 - 8)x10 + (1x8)x1] - (8x145)x10=$$

$$348x\ 8.541 = (2.800.000 + 170.000 + 13.600 + 260 + 8) - 11.600$$

$$348x\ 8.541 = 2.972.268$$

10) Decomposition of multiplications Alternative Method

01

253 x **981** = 248.193

A)	9x2		1	8				
B)	9x5+3			4	8			
C)	8x2			1	6			
D)	8x5				4	0		
D)	1x2					2		
E)	1x5-3						2	
F)	1x3	+						3
Total			2	4	8	2	2	3
G)	3x1	-					3	
Product			**2**	**4**	**8**	**1**	**9**	**3**

$$253x981 = [(9x2)x10.000 + (9x5 + 3)x1.000 + (8x2)x1000 + (8x5)x100 + (1x2)x100 + (1x5 - 3)x10 + (1x3)x1] - (3x1)x10=$$

$$= (180.000 + 48.000 + 16.000 + 4.000 + 200 + 20 + 3) - 30$$

$$253x\ 981 = 248.193$$

Conclusion

This new algorithm of multiplication presents a surprising accuracy, which transforms it into a reliable system or method to perform the multiplication operations.

With this algorithm we use the three basic operations for its operation.

I'm not sure it's simpler than the traditional multiplication method but I'm not sure it's harder either. It is simply different, it is a novel and interesting alternative.

Profesor Zeolla Gabriel Martin

12/11/18

Reference

Zeolla Gabriel Martin, Nuevo Algoritmo de Multiplicación (versión en Español) http://vixra.org/abs/1811.0211. Date 13-11-2018 (registrado en la ciudad de Buenos Aires, Argentina)