GP07 ej1

→ Multiplicador en punto flo[...]

Formato

s	e	m
Sign	Expo	Mantisa
1	4	8

$1 + 4 + 8 = 13$ ✓

exponente con sesgo de 7.

$2^4 = 16$ → con 4 bits llegado a 15 (0 a F).

con signo va de $-2^3 = -8$ a $2^3 - 1 = 7$ → sesgo de $2^3 - 1 = 7$

⇒

Base	# bits exponente	sesgo expo	E min	E max	# bits man
2	4	7	-7	8	8

⇒ Número dec = $S \cdot m \cdot 2^{(e-7)}$

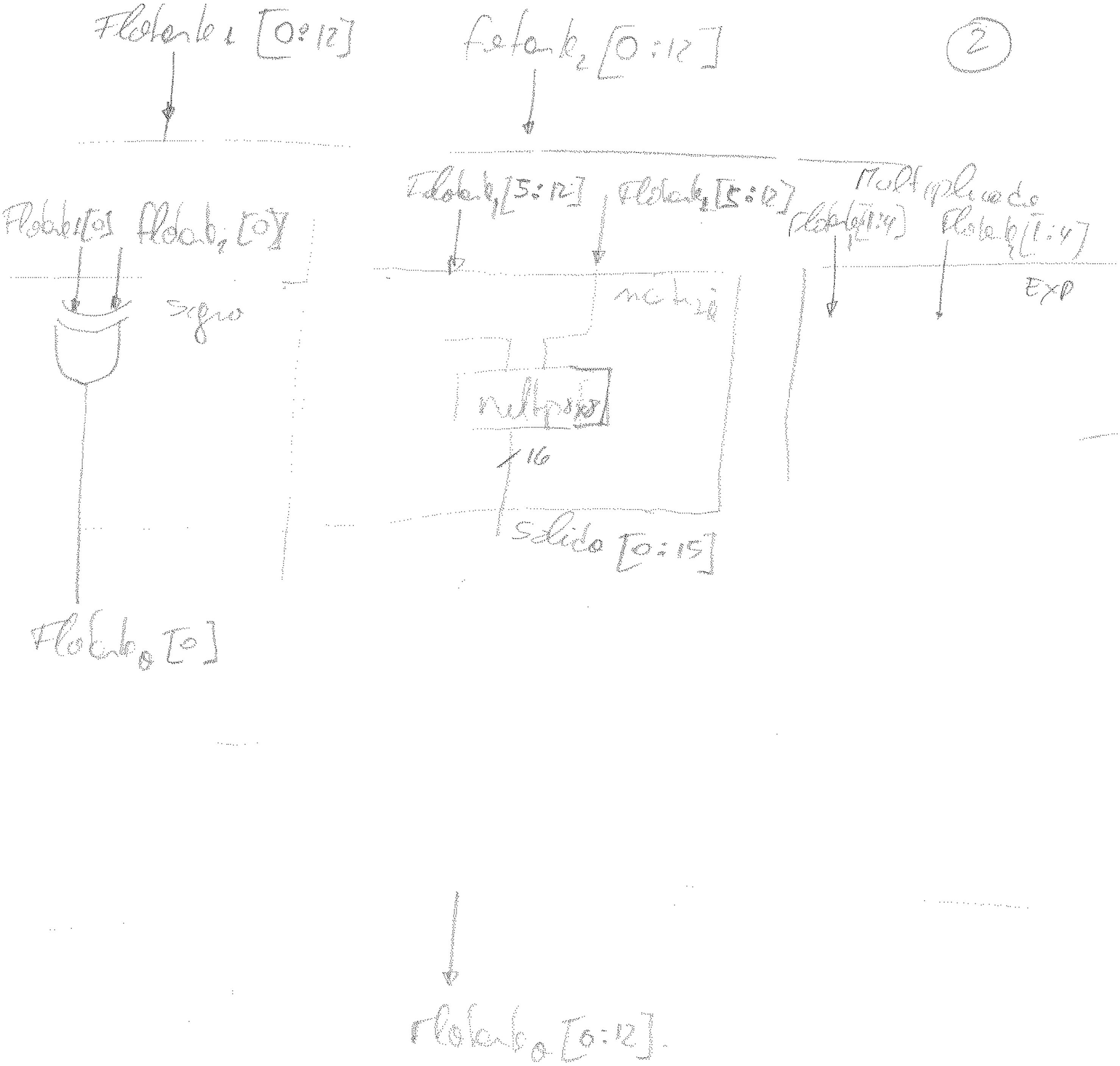
Multiplicar 2 números $N_1 \cdot N_2$ $\quad N_1 = S_1 \cdot m_1 \cdot 2^{(e_1-7)}$

$N_2 = S_2 \cdot m_2 \cdot 2^{(e_2-7)}$

$N_3 = N_1 \cdot N_2 = S_1 \cdot m_1 \cdot 2^{(e_1-7)} \cdot S_2 \cdot m_2 \cdot 2^{(e_2-7)} = S_1 S_2 \cdot m_1 m_2 \cdot 2^{(e_1+e_2 \ldots)}$

⇒ N_3 :

S_3	m_3	e_3
[illegible]	$m_1 \cdot m_2$ (truncado)	$e_1 + e_2 - 7$


Floatante1 [0:12]
Floatante2 [0:12]
Floatante1[0]
Floatante2[0]
Signo
Floatante1[5:12]
Floatante2[5:12]
Multiplicado
Floatante2[1:4]
Exp
multiplicar
16
Salida [0:15]
Floatante0[0]
Floatante0[0:12].

1. $x_4 x_3 x_2 x_1 x_0$

1. $y_4 y_3 y_2 y_1 y_0$

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1 $x_4 x_3 x_2 x_1 x_0$

y_4 $y_4 x_4$ $y_4 x_3$ $y_4 x_2$ $y_4 x_1$ $y_4 x_0$

1, $x_2 x_1 x_0$

1, $y_2 y_1 y_0$.

			$y_0 \cdot 1$	$y_0 x_2$	$y_0 x_1$	$y_0 x_0$
		y_1	$y_1 x_2$	$y_1 x_1$	$y_1 x_0$	
	$y_2 \cdot 1$	$y_2 \cdot x_1$	$y_2 x_1$	$y_2 \cdot x_0$		
1	$1 \cdot x_2$	$1 \cdot x_1$	$1 \cdot x_0$			

En cambio luego queda

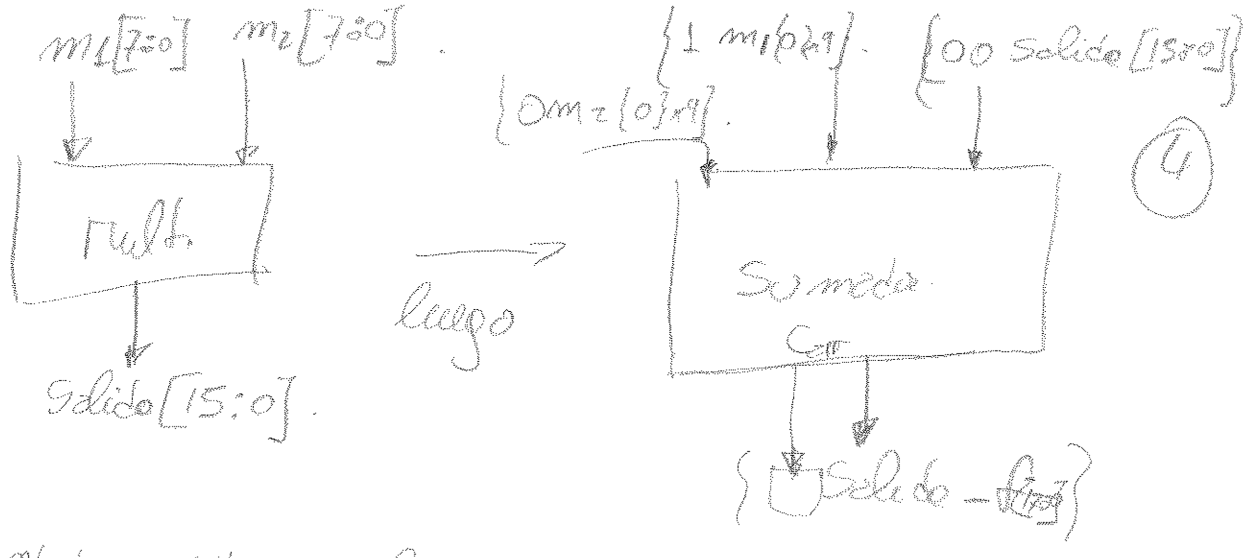
$x_2 x_1 x_0$

x y_2 y_1 y_0

$y_2 \cdot x_2$	$y_2 \cdot x_1$	$y_2 \cdot x_0$	
	$y_2 x_1$	$y_1 \cdot x_1$	$y_2 \cdot x_0$
		$y_0 \cdot x_2$	$y_0 \cdot x_1$	$y_0 \cdot x_0$

tengo que sumar:

1	x_2	x_1	x_0
	y_2	y_1	y_0



Entra 9bits x 9bits → sale 18b.

8
8
16.

0	0	Salida[15]	S[14]	S[13]	S[12]	S[11]	S[10]	S[9]	...	S[0]
1	m1[7]	m1[6]	m1[5]	m1[4]	m1[3]	m1[2]	m1[1]	m1[0]	0...0	0
0	m2[7]	m2[6]	m2[5]	m2[4]	m2[3]	m2[2]	m2[1]	m2[0]	0...0	0
									...	

No hace carry

overflow (si hay carry) → tengo que avisar de exp ...

overflow Exponente ...

{0 Salida[15:9]}
{ m1[7:0] }
{ m2[7:0] }.

Suma → Si hay carry ⇒ {1 0 Suma}

Suma → Si no hay carry {1 suma}

13 bits

Float 1.	1	0101	11000110	-0,44335937 5
Float 2	0	1100	00011101	35,625
Float 3	0	0011	11001101	0,112548828
Float 4	1	1011	00101011	-18,6875

Float 1:

Signo → (-)

Exp → 0101 → 5 ⇒ 5 - 7 = -2

Mantiza → 1.11000110 → $1 + 2^{-1} + 2^{-2} + 2^{-6} + 2^{-7} = 1,77343$

⇒ $F_1 = -0,44335937 5$

Float 2:

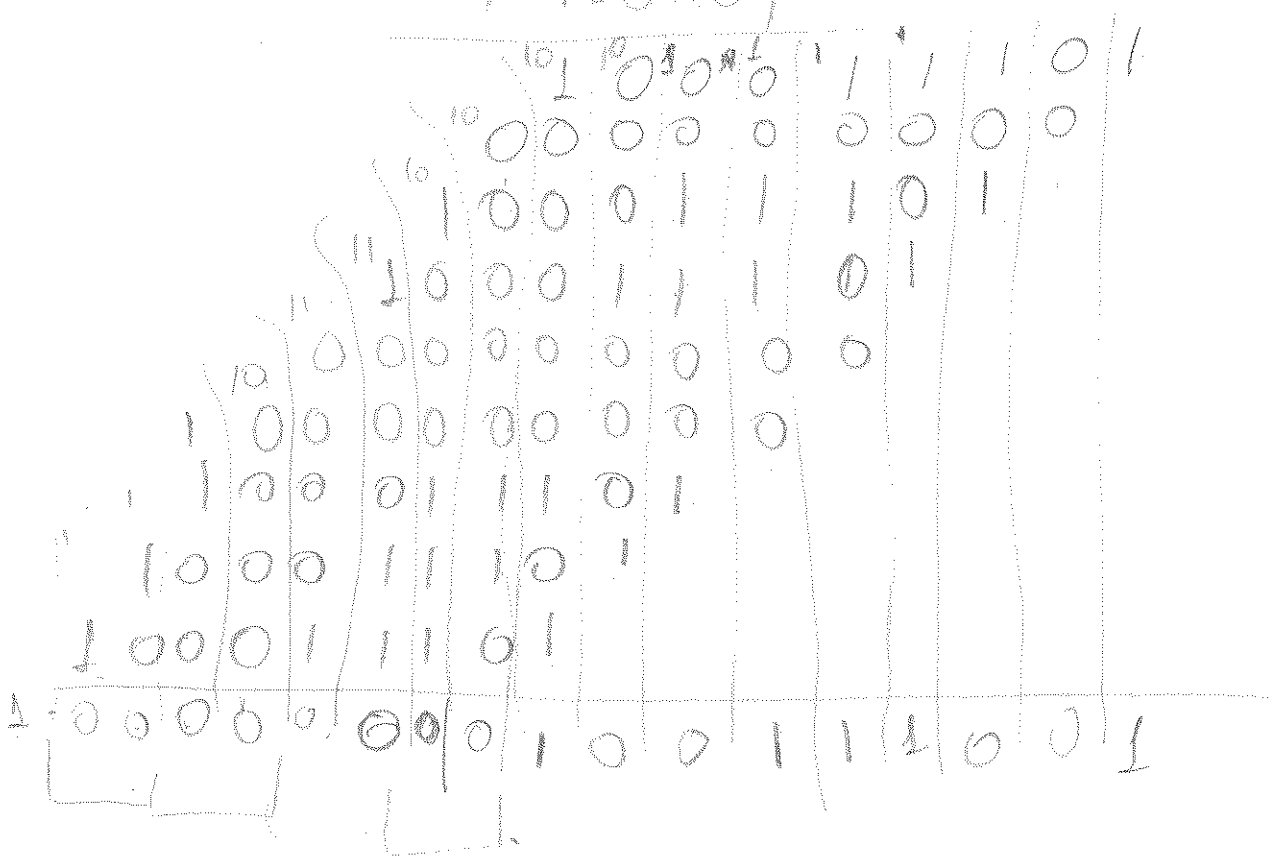
Signo → (+)
Exp → 5
Mantiza → 1,11328125

} $F_2 = 35,625$

6

1,000 1101

× 1, 1001 1010



10
× 10
100

11
× 11
1001
11
11
110