Problème 1

$$261,231_7 = 2\times7^2 + 6\times7 + 1, 2\times7^{-1} + 3\times7^{-2} + 1\times7^{-3}$$
$$= 2\times49 + 42 + 1, 2\times0,1429 + 3\times0,0204 + 0,0029$$
$$= 98 + 42 + 1, 0,2858 + 0,0612 + 0,0029$$
$$= 141,3499_{10}$$

141,3499
- 128,0000 → 1
13,3499
- 64 → 0
13,3499
- 32, → 0
13,3499
- 16 → 0
13,3499
- 8 → 1
5,3499
- 4 → 1
1,3499
- 2 → 0
1,3499
- 1 → 1
0,3499
- 0,5 → 0
0,3499
- 0,25 → 1
0,0999
- 0,125
0,0999
- 0,0625 → 1
0,0374

$$= 10001101,0111_2$$

$$= 8D,6_{16}$$

Pregunta 1

$$141,3499$$
$$-\ 125 \rightarrow 1$$
$$16,3499$$
$$-\ 25 \rightarrow 0$$
$$16,3499$$
$$-\ 15 \rightarrow 3\times 5 = 15$$
$$1,3499$$
$$-\ 1 \rightarrow 1$$
$$0,3499$$
$$-\ 0,2 \rightarrow 1$$
$$0,1499$$
$$-\ 0,1200 \rightarrow 3\times 0,04 = 0,12$$
$$0,0299$$
$$-\ 0,024 \rightarrow 3\times 0,008 = 0,024$$
$$59$$

$$= 1031,133_5$$

Pregunta 2

$64_{10} \rightarrow$ 0110 0100$_{BCD}$

$26_{10} \rightarrow$ 0010 0110$_{BCD}$

$$\begin{array}{r} 64 \\ 26 \\ \hline 384 \\ 1280 \\ \hline 1664 \end{array}$$

Resolvemos primero 64×6

$$\begin{array}{rrrr} & 0110 & 0100 & \\ \times & & 0110 & \\ \hline & 0000 & 0000 & \\ + & 1100 & 100 & \\ + & 1 1001 & 00 & \rightarrow \text{carry; suma } 0110\ 0110 \text{ (a)} \\ + & 0 0000 & 0 & \\ \hline & 10 0101 & 1000 & \rightarrow \text{carry; suma } 0110\ 0000 \text{ (b)} \\ + & 00 0110 & 0110 & \text{(a)} \\ \hline & 10 1011 & 1110 & \rightarrow \text{no BCD; suma } 0110\ 0110 \text{ (c)} \\ + & 00 0110 & 0110 & \text{(c)} \\ \hline & 11 0010 & 0100 & \\ + & 00 0110 & 0000 & \text{(b)} \\ \hline & 11 1000 & 0100 & \rightarrow 384 \end{array}$$

Pregunta 2

Ahora resolvemos 64×20

```
          0110    0100
        x 0010    0000
        ------------------
          0000    0000    0000
    +   1100    1000    0000
        ------------------
          1100    1000    0000   -> en BCD: suma 0110 0000 0000
    +     0110    0000    0000
        ------------------
    1   0010    1000    0000     -> 1280
```

Sumamos ambos resultados

```
          0 0011    1000    0100
    +     1 0010    1000    0000
        ------------------
          1 0110    0000    0100   -> carry: sumamos 0 0000 0110 0000
          0 0000    0110    0000
        ------------------
          1 0110    0110    0100   -> 1664
```

Pregunta 3

$252_{10} - 167$

$+252_{10} \rightarrow 0\ 1111\ 1100 = 128 + 64 + 32 + 16 + 8 + 4$

$+167_{10} \rightarrow 0\ 1010\ 0111 = 128 + 32 + 4 + 2 + 1$

$\hookrightarrow -167_{10} \rightarrow 1\ 0101\ 1001$

$$\begin{array}{r} 0\ 1111\ 1100 \\ 1\ 0101\ 1001 \\ \hline 0\ 0101\ 0101 \end{array}$$

$\boxed{0\ 0101\ 0101_2} = 85$

Problema 4

A_1	A_0	B_1	B_0	F_1	F_2	F_3
0	0	0	0	0	1	0
0	0	0	1	0	0	1
0	0	1	0	0	0	1
0	0	1	1	0	0	1
0	1	0	0	1	0	0
0	1	0	1	0	1	0
0	1	1	0	0	0	1
0	1	1	1	0	0	1
1	0	0	0	1	0	0
1	0	0	1	1	0	0
1	0	1	0	0	1	0
1	0	1	1	0	0	1
1	1	0	0	1	0	0
1	1	0	1	1	0	0
1	1	1	0	1	0	0
1	1	1	1	0	1	0

$F_1 = A > B$

$F_2 = A = B$

$F_3 = A < B$

$$F_1 = A_1\bar{B}_1 + A_0\bar{B}_1\bar{B}_0 + A_1A_0B_0$$

A_1A_0 \ B_1B_0	00	01	11	10
00	0	0	0	0
01	1	0	0	0
11	1	1	0	1
10	1	1	0	0

$$F_3 = \bar{A}_1B_1 + \bar{A}_1\bar{A}_0B_0 + \bar{A}_0B_1B_0$$

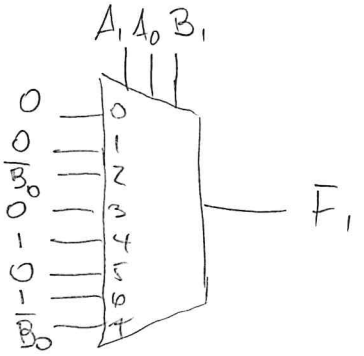
A_1A_0 \ B_1B_0	00	01	11	10
00	0	1	1	1
01	0	0	1	1
11	0	0	0	0
10	0	0	1	0

$$F_2 = \bar{A}_1\bar{A}_0\bar{B}_1\bar{B}_0 + \bar{A}_1A_0\bar{B}_1B_0 + A_1A_0B_1B_0 + A_1\bar{A}_0B_1\bar{B}_0$$

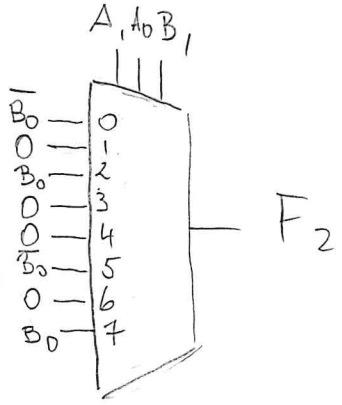
A_1A_0 \ B_1B_0	00	01	11	10
00	1	0	0	0
01	0	1	0	0
11	0	0	1	0
10	0	0	0	1

Pregunta 5

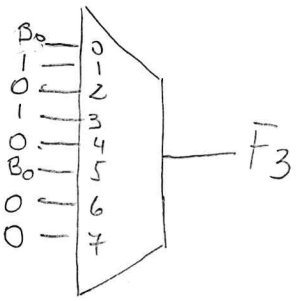
F_1



F_2

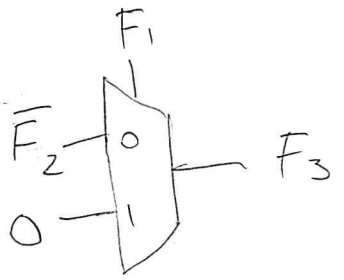


F_3



Alternativamente se puede reutilizar F_1 y F_2 para calcular F_3

F_3



F_1	F_2	$\overline{F_3}$
0	0	1
0	1	0
1	0	0
1	1	0

Pregunta 6

Nicolás Massu campeón dobles junior Wimbledon 1997 junto a Luis Horna.

$N \xrightarrow{\text{ASCII}} 4E_{16} = 100\ 111\ 0_2$

Paridad impar

1	2	3	4	5	6	7	8	9	10	11
P_1	P_2	m_1	P_3	m_2	m_3	m_4	P_4	m_5	m_6	m_7
0	0	1	0	0	0	1	1	1	1	0

$2^k \geq m + k + 1$

$2^k \geq 7 + k + 1$

$2^k \geq 8 + k$

$\Rightarrow k = 4$