Ejercicios 1, 2, 3 y 4 Representación Computacional de Datos Arquitectura del Computador

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1. (a) representable con 5 dígitos $(29)_{10} = (-1)^0 \cdot (11101)_2$

   (b) representable con 4 dígitos $(0.625)_{10} = (-1)^0 \cdot (0.101)_2$

   (c) periódico, infinitos dígitos $(0.1)_{10} = (-1)^0 \cdot (0.0001100110011)_2$

   (d) representable con 5 dígitos $(5.75)_{10} = (-1)^0 \cdot (101.11)_2$

   (e) representable con 8 dígitos $(-138)_{10} = (-1)^1 \cdot (10001010)_2$

   (f) representable con 7 dígitos $(-15.125)_{10} = (-1)^1 \cdot (1111.001)_2$

2. $n = 6$

   (a) $C_2^{(-16)} = (2^6)_{10} - |(-16)_{10}| = (1000000)_2 - (10000)_2 = (110000)_{comp2}$

   (b) $C_2^{(13)} = (13)_{10} = (001101)_{comp2}$

   (c) $C_2^{(-1)} = (2^6)_{10} - |(-1)_{10}| = (1000000)_2 - (1)_2 = (111111)_{comp2}$

   (d) $C_2^{(-10)} = (2^6)_{10} - |(-10)_{10}| = (1000000)_2 - (1010)_2 = (110110)_{comp2}$

   (e) $C_2^{(16)} = (16)_{10} = (010000)_{comp2}$

   (f) $C_2^{(-31)} = (2^6)_{10} - |(-31)_{10}| = (1000000)_2 - (11111)_2 = (100001)_{comp2}$

   Podemos ver que todos los numeros negativos comienzan con 1 y los positivos con 0.

3. $n = 8$

   (a) $C_2^{(-16)} = (2^8)_{10} - |(-16)_{10}| = (100000000)_2 - (10000)_2 = (11110000)_{comp2}$

   (b) $C_2^{(13)} = (13)_{10} = (00001101)_{comp2}$

   (c) $C_2^{(-1)} = (2^8)_{10} - |(-1)_{10}| = (100000000)_2 - (1)_2 = (11111111)_{comp2}$

   (d) $C_2^{(-10)} = (2^8)_{10} - |(-10)_{10}| = (100000000)_2 - (1010)_2 = (11110110)_{comp2}$

   (e) $C_2^{(16)} = (16)_{10} = (00010000)_{comp2}$

   (f) $C_2^{(-31)} = (2^8)_{10} - |(-31)_{10}| = (100000000)_2 - (11111)_2 = (11100001)_{comp2}$

   Al agregar mas bits a la representación, además de extender el rango de números representables, vemos que la diferencia entre usar los 6 bits y los 8 bits, es agregar 2 0's al principio si son positivos, y 2 1's al principio si son negativos.

4. (a) $(00001101)_{comp2} = (1101)_2 = (13)_{10}$

   (b) $(01001101)_{comp2} = (1001101)_2 = (77)_{10}$

   (c) $(11100001)_{comp2} = -(11111)_2 = (-31)_{10}$

   (d) $(11111001)_{comp2} = -(111)_2 = (-7)_{10}$

   (e) $(11111111)_{comp2} = -(1)_2 = (-1)_{10}$

   (f) $(00000000)_{comp2} = (0)_2 = (0)_{10}$