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CSC 11
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Homework

1. Convert 57, 44, 31, 15 to base 2, 8, 16
2. Find −44 and −15 in base 2, 16
3. Calculate 57 − 44 and 31 − 15 in base 2, 16

57 − 32 = 25; 25 − 16 = 9; 9 − 8 = 1

1. 57_{10}: $0\times2^7 + 0\times2^6 + 1\times2^5 + 1\times2^4 + 1\times2^3 + 0\times2^2 + 0\times2^1 + 1\times2^0$

57 base 2 = 00111001

57 base 8 = 000|111|001 = 71 (7 1)

57 base 16 = 0011|1001 = 39 (3 9)

> 57 in base 2 = 00111001
> base 8 = 71
> base 16 = 39

44 − 32 = 12; 12 − 8 = 4

44_{10}: $0\times2^7 + 0\times2^6 + 1\times2^5 + 0\times2^4 + 1\times2^3 + 1\times2^2 + 0\times2^1 + 0\times2^0$

44 base 2 = 00101100

44 base 8 = 000|101|100 = 54 (0 5 4)

44 base 16 = 0010|1100 = 2C (2 C)

> 44 in base 2 = 00101100
> base 8 = 54
> base 16 = 2C

31 − 16 = 15; 15 − 8 = 7; 7 − 4 = 3; 3 − 2 = 1

31_{10}: $0\times2^7 + 0\times2^6 + 0\times2^5 + 1\times2^4 + 1\times2^3 + 1\times2^2 + 1\times2^1 + 1\times2^0$

31 base 2 = 0001 1111

31 base 8 = 000|011|111 = 37 (0 3 7)

31 base 16 = 0001|1111 = 1F (1 F)

> 31 in base 2 = 0001 1111
> base 8 = 37
> base 16 = 1F

15_{10}: $0\times2^7 + 0\times2^6 + 0\times2^5 + 0\times2^4 + 1\times2^3 + 1\times2^2 + 1\times2^1 + 1\times2^0$

15 − 8 = 7; 7 − 4 = 3; 3 − 2 = 1

15 base 2 = 0000 1111

15 base 8 = 00|001|111 = 17 (0 1 7)

15 base 16 = 0000|1111 = ØF (Ø F)

> 15 in base 2 = 0000 1111
> base 8 = 17
> base 16 = ØF

2. 44 base 2 = 00101100

two's complement = 11010011 + 1

−44 = 11010100

> -44_{10} = 11010100