Austin Nguyen

CS21 Lab 2

Repeated Division

0 | 0 → 0000 0000
0

12 | 0 → 0000 1100
6 | 0
3 | 1
1 | 1
0

15 | 1 → 0000 1111
7 | 1
3 | 1
1 | 1
0

16 | 0 → 0001 0000
8 | 0
4 | 0
2 | 0
1 | 1
0

37 | 1 → 0010 0101
18 | 0
9 | 1
4 | 0
2 | 0
1 | 1
0

54 | 0 → 0011 0110
27 | 1
13 | 1
6 | 0
3 | 1
1 | 1
0

64 | 0 → 0100 0000
32 | 0
16 | 0
8 | 0
4 | 0
2 | 0
1 | 1
0

127 | 1 → 0111 1111
63 | 1
31 | 1
15 | 1
7 | 1
3 | 1
1 | 1
0

254 | 0 → 1111 1110
127 | 1
63 | 1
31 | 1
15 | 1
7 | 1
3 | 1
1 | 1
0

Place Values

128 64 32 16 8 4 2 1

00101001 = 32+8+1 = 41

01110000 = 64+32+16 = 112

10000000 = 128

00100010 = 32+2 = 34

11111111 = 128+64+32+16+8+4+2+1 = 255

01010101 = 64+16+4+1 = 85

00000000 = 0

01000001 = 64+1 = 65

Austin Nguyen

CS21 Lab 2 pg 2

0010 1001 = 41	1111 1111 = 255
1 2 5 10 20 41	1 3 7 15 31 63 127 255
0111 0000 = 112	0101 0101 = 85
1 3 7 14 28 56 112	1 2 5 10 21 42 85
1000 0000 = 128	0000 0000 = 0
1 2 4 8 16 32 64 128	
0010 0010 = 34	0100 0001 = 65
1 2 4 8 17 34	1 2 4 8 16 32 65

To Decimal

$124_4 = 1 \cdot 4^2 + 2 \cdot 4^1 + 4 = 28_{10}$

$0xFF = 15 \cdot 16^1 + 15 = 255_{10}$

$A5_{13} = 10 \cdot 13^1 + 5 = 135_{10}$

$101_7 = 1 \cdot 7^2 + 0 \cdot 7^1 + 1 = 50_{10}$

$101_8 = 1 \cdot 8^2 + 0 \cdot 8^1 + 1 = 65_{10}$

$101_9 = 1 \cdot 9^2 + 0 \cdot 9^1 + 1 = 82_{10}$