

logics

Bit 1	Bit 2	Output
0	0	0
1	1	0

0	1	1
1	0	1

$$\begin{array}{r} 0101 \\ 0101 \\ \hline 0000 \end{array}$$

$$n_1 = 5, \quad n_2 = 6$$

$$n_1 = n_1 \wedge n_2 \quad n_1 \equiv n_1 \wedge n_2 \rightarrow 6$$

1

$$2 \mid 3 \rightarrow 1$$

4

101

110

$$0 \mid 1 \rightarrow 3 \rightarrow n_1$$

011

110

$$\underline{101} \rightarrow n_2$$

011

101

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110

$$\begin{aligned} n_1 &= 6 \\ n_2 &= 5 \end{aligned}$$

→ This way  
we swap

$$\begin{array}{ccc} 0 & 1 & 1 \\ \swarrow & \searrow & \swarrow \\ 0 \times 2 & 1 \times 2 & 2 \times 1 \\ 0 & 1 & 1 \end{array}$$

Q<sub>2</sub>) ~~100~~  $n+1$  Using Bitwise

$$\begin{aligned} -2n &\rightarrow -25 \\ &-(-6) \\ &= \underline{\underline{6}} \quad \checkmark \end{aligned}$$

0101  
→ 1's com  
010  
1 → 2's  
011 → -6

Q4) 100P uppercase letter's A to Z  
for (char ch = 'A' to ch <= 'z')

② Convert each upper case letter to lower case using OR-ing with 32

Ex 'A' (65) | 32 = '0' (97)

$$\begin{array}{cccccc} 1 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 \end{array} \rightarrow 32$$

$$\begin{array}{ccccccc}
 1 & 1 & 0 & 0 & 0 & 0 & 1 \\
 \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\
 1 \times 2^6 & & & & & & 1 \times 2^0 \\
 \downarrow & 1 \times 2^5 & 0 & 0 & 0 & 0 & 1 \times 2^0 \\
 64 & 32 & & & & & 
 \end{array}$$

$$64 + 32 + 1 = 97 \rightarrow 'a'$$

$$\begin{array}{l}
 2 \overline{) 65} \rightarrow 1 \quad 2 \overline{) 32} \rightarrow 0 \\
 2 \overline{) 32} \rightarrow 0 \quad 2 \overline{) 16} \rightarrow 0 \\
 2 \overline{) 16} \rightarrow 0 \quad 2 \overline{) 8} \rightarrow 0 \\
 2 \overline{) 8} \rightarrow 0 \quad 2 \overline{) 4} \rightarrow 0 \\
 2 \overline{) 4} \rightarrow 0 \quad 2 \overline{) 2} \rightarrow 0 \\
 2 \overline{) 2} \rightarrow 0 \quad 1
 \end{array}$$