

$$n = 0101 - 5$$

↑  
0010

set 1 to nth bit

$$n = n | (1 \ll i)$$

$$n = 1010 - 10$$

↑  
1101

set 0 to nth bit

$$n = n \& (\sim(1 \ll i))$$

$$n = 0101 - 5$$

↑  
0100

Get nth bit

$$\text{ans} = n \& (1 \ll i)$$

$$n = 0101 - 5$$

nth 1 if 0  
toggle 0 - 1

$$n = n \wedge (1 \ll i)$$

$$\begin{array}{r} \textcircled{0}10 \\ \wedge \\ 0100 \\ \hline 1110 \end{array} \quad \begin{array}{r} 0\textcircled{1}01 \\ \wedge \\ 01100 \\ \hline 0001 \end{array}$$

↑                      ↑

set 0 to right bit

$$n = \begin{array}{ccc} 0101 & 1010 & 1100 \\ \downarrow & \downarrow & \downarrow \\ 0100 & 1000 & 1000 \end{array}$$

$$n = n \& (n-1)$$

get right most 1st bit

$$n = \begin{array}{ccc} 010\bar{1} & 10\bar{1}0 & 1\bar{1}00 \\ \downarrow & \downarrow & \downarrow \\ 0001 & 0010 & 0100 \end{array}$$

$$n = n \& (-n)$$

$$n = n \& ((n \ll 1) + 1)$$

$$n = n \& \sim(n-1)$$

$$\begin{array}{r} 0101 - 5 \\ 0001 - 1 \\ \hline 0001 \end{array}$$

$$\begin{array}{r} 1010 \\ \& 0110 \\ \hline 0010 \end{array}$$

$$\begin{array}{r} 0101 \rightarrow \sim n = 1010 \\ \& 1011 \leftarrow -n \\ \hline 0001 \end{array}$$

$$\begin{array}{r} 0011 \\ + 1 \\ \hline 0100 \end{array}$$

$$\begin{array}{r} 1100 \\ \& 0100 \\ \hline 0100 \end{array}$$

$$\rightarrow [2, 2, 5, \textcircled{7}, 5, 1, 3, 3, 1]$$

$$\begin{array}{c} \wedge \\ [2, 2, 5, 7, 5, 1, 3, 4, 3, 1] \end{array}$$

$$\text{ans} = 2 \& 2 \rightarrow 0$$

$$\begin{array}{l} 2 \rightarrow 010 \\ 5 \rightarrow 101 \\ 7 \rightarrow 111 \\ 1 \rightarrow 001 \\ 3 \rightarrow 011 \end{array}$$

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D

$$\text{ans} = 4 \checkmark$$

$$\text{ans} = 7 \checkmark$$

$$\begin{array}{c} \textcircled{0}10 \\ \textcircled{0}10 \\ \hline 11 \end{array}$$

$$\begin{array}{r} -5 \\ + 2 \\ \hline -3 \end{array}$$

$$\begin{array}{r} 11111011 \\ + 010 \\ \hline 11111101 \end{array}$$

$$15 \rightarrow 00000011$$

$$\begin{array}{r} 00000011 \\ - 000011 \\ \hline -3 \end{array}$$

$$\begin{array}{r} 5 \& -5 \\ \hline 5 \end{array}$$

$$\begin{array}{r} \dots 0101 \\ \sim 1010 \\ + 1 \\ \hline 01111101 \end{array}$$

mem

$$\begin{array}{r} 00000100 \\ + 1 \\ \hline 00000101 \\ - 0000101 \\ \hline -5 \end{array}$$

