

Step-by-Step Process

1. Create the Mask

We start with 1 and shift it left by `pos` positions.

$$\begin{array}{rcl} 1U \ll 6 & \text{(shifting 1 left by 6 positions)} & \\ 00000001 & \text{(1 in binary)} & \\ & \ll 6 & \\ \hline 01000000 & \text{(This is the mask with a 1 at position 6)} & \end{array}$$

2. Invert the Mask

Next, we invert the mask using the ones complement operator (\sim).

$$\begin{array}{rcl} \sim (01000000) & & \\ 01000000 & \text{(Original mask)} & \\ & \sim & \\ \hline 10111111 & \text{(Inverted mask)} & \end{array}$$

3. Apply the Mask to Clear the Bit

Now, we use the bitwise AND assignment ($\&=$) operator with the inverted mask to clear the bit at position 6 in `vec`.

$$\begin{array}{rcl} \text{vec}\&= 10111111 & \\ 00001111 & \text{(vec)} & \\ & \& & \\ 10111111 & \text{(Inverted mask)} & \\ \hline 00001111 & \text{(Result after clearing the bit at position 6)} & \end{array}$$

Summary

- **Mask Creation:** $1U \ll 6$ results in 01000000.
- **Mask Inversion:** $\sim (01000000)$ results in 10111111.
- **Bit Clearing:** $\text{vec}\&= 10111111$ results in 00001111.