

Bitmask & Bitwise Operations – Interview Cheat Sheet

Save this for quick revision before coding interviews.

Operation	Formula (Java)	What it does
Set bit	<code>mask = mask (1 << i)</code>	Turns bit i ON
Check bit	<code>(mask & (1 << i)) != 0</code>	Checks if bit i is ON
Clear bit	<code>mask = mask & ~(1 << i)</code>	Turns bit i OFF
Toggle bit	<code>mask = mask ^ (1 << i)</code>	Flips bit i
Set all n bits	<code>mask = (1 << n) - 1</code>	All n bits ON
Clear all bits	<code>mask = 0</code>	All bits OFF
Remove rightmost 1	<code>n = n & (n - 1)</code>	Drops lowest set bit
Get rightmost 1	<code>n & -n</code>	Isolates lowest set bit
Check power of 2	<code>(n & (n - 1)) == 0</code>	Only one bit set

Operator	Name	Meaning
<code>&</code>	AND	Both bits must be 1
<code> </code>	OR	Either bit is 1
<code>^</code>	XOR	Bits are different
<code>~</code>	NOT	Flips all bits
<code><<</code>	Left Shift	Multiply by 2
<code>>></code>	Right Shift	Divide by 2

Interview tip: Bitmasking lets you represent multiple boolean states efficiently using integers and bitwise operations.