

Bitmask & Bitwise Operations – Interview Cheat Sheet

Save this for quick revision before coding interviews.

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

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

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