

# Arithmetic and Logical Operations: Recap

The following table lists the x86-64 integer arithmetic operations.

Instruction	Effect	Description
<i>leaq S, D</i>	$D \leftarrow \&S$	Load effective address
<i>inc D</i>	$D \leftarrow S + 1$	Increment
<i>dec D</i>	$D \leftarrow S - 1$	Decrement
<i>neg D</i>	$D \leftarrow -S$	Negate
<i>not D</i>	$D \leftarrow \sim S$	Complement
<i>add S, D</i>	$D \leftarrow D + S$	Add
<i>sub S, D</i>	$D \leftarrow D - S$	Subtract
<i>imul S, D</i>	$D \leftarrow D \times S$	Multiply
<i>xor S, D</i>	$D \leftarrow D \wedge S$	Exclusive-or
<i>or S, D</i>	$D \leftarrow D \mid S$	Or
<i>and S, D</i>	$D \leftarrow D \& S$	And
<i>sal k, D</i>	$D \leftarrow D \ll k$	Left shift
<i>shl k, D</i>	$D \leftarrow D \ll k$	Left shift (same as <i>sal</i> )
<i>sar k, D</i>	$D \leftarrow D \gg_A k$	Arithmetic right shift
<i>shr k, D</i>	$D \leftarrow D \gg_L k$	Logical right shift

