Interview Cake

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Bitwise NOT

The **NOT** bitwise operation inverts bits. A 0 becomes a 1. A 1 becomes a 0.

The NOT operator is often written as a **tilde character** ("~"):

Python 3.6 ▾

```
~ 0000 0101
= 1111 1010
```

When numbers are printed in base-10, the result of a NOT operation can be surprising. In particular, positive numbers can become negative and negative numbers can become positive. For example:

Python 3.6 ▾

```
~ 5  # gives -6

# At the bit level:
#   ~ 0000 0101  (5)
#   = 1111 1010  (-6)
```

This is because numbers are (usually) represented using two's complement, where the leftmost bit is actually negative (/concept/binary-numbers#twos-complement). So flipping the leftmost bit usually flips the sign of the number.

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