**Introduction to Mod Code**

This page introduces how the "mod" % operator works in Java and other languages along with a few live practice code problems.

## Mod % Operator

* Modulus operator % -- "mod" for short
* e.g. 23 % 10 → 3
* Repeatedly subtract 10 from 23 .. what's left?
* Like the "remainder" after dividing by 10
* Basically all languages use the % symbol for mod

You're familiar with the 4 arithmetic operations + - \* /. The % modulus operator is an additional arithmetic operation: basically the remainder left over after division. For example, what is 73 % 10? The simplest way to think about it is, keep subtracting 10's from 73 until there's less than 10 left (3 in this case).

* Mod yields 0 means divides evenly
* e.g. 30 % 10 → 0
* "N multiple of 5?" → (N % 5) == 0?

## Key Features of Mod

* When mod by N yields 0, N divides in evenly
* Mod by N yields a number in the range 0..N-1 (inclusive)
* e.g. mod by 10 yields 0..9
* e.g. mod by 100 yields 0..99
* Don't mod by 0, it's an error (like divide by 0 is an error)
* Don't use negative numbers ( \* -1 as needed)

## Practice Mod Problems

http://codingbat.com/c1.jpg[or35](http://codingbat.com/prob/p112564?parent=/doc/practice/mod-introduction.html) H   http://codingbat.com/c1.jpg[specialEleven](http://codingbat.com/prob/p100962?parent=/doc/practice/mod-introduction.html)  http://codingbat.com/c1.jpg[old35](http://codingbat.com/prob/p159612?parent=/doc/practice/mod-introduction.html)  http://codingbat.com/c1.jpg[more20](http://codingbat.com/prob/p118290?parent=/doc/practice/mod-introduction.html)  http://codingbat.com/c1.jpg[less20](http://codingbat.com/prob/p133158?parent=/doc/practice/mod-introduction.html)  http://codingbat.com/c1.jpg[nearTen](http://codingbat.com/prob/p193613?parent=/doc/practice/mod-introduction.html)

## MakeBricks Problem

More difficult problems that also use mod: http://codingbat.com/c1.jpg[makeBricks](http://codingbat.com/prob/p183562?parent=/doc/practice/mod-introduction.html)  http://codingbat.com/c1.jpg[makeChocolate](http://codingbat.com/prob/p191363?parent=/doc/practice/mod-introduction.html)

(in python: http://codingbat.com/c1.jpg[make\_bricks](http://codingbat.com/prob/p118406?parent=/doc/practice/mod-introduction.html)  http://codingbat.com/c1.jpg[make\_chocolate](http://codingbat.com/prob/p190859?parent=/doc/practice/mod-introduction.html) )

See also [Introduction to MakeBricks](http://codingbat.com/doc/practice/makebricks-introduction.html)

[CodingBat.com](http://codingbat.com/) code practice.