Modular Arithmetic

We know that the ans of a%n lies b/w

$$a \% n \Rightarrow [0 \ldots\ldots n-1]$$

$10 \% 3 \Rightarrow [0, 1, 2]$

$5 \% 4 \Rightarrow [0, 1, 2, 3]$ } remainder

Generally to avoid overflow while storing integer we do modulo with a large no.

1. $(a+b) \% M = a \% m + b \% m$
2. $a \% m - b \% m = (a-b) \% m$
3. $((a \% m) \% m) \% m = a \% m$
4. $a \% m * b \% m = (a*b) \% m$

Why we use this?

Sometimes when we solve questions our ans is larger than the int range so the problem says you have to return the ans $\rightarrow$ ans%m

ans $\Rightarrow [0 \rightarrow m-1]$

range of m $\Rightarrow 10^9$