

For loops

Structure:

```
for(①; ②; ④){  
    ③;  
    :  
}  
// ⑤ rest of your code
```

- ① any statement
- ② boolean expr.
- ③ any statements
- ④ any statement



As a while loop:

```
①;  
while((②)){  
    ③; ...  
    ④;  
}
```

Exercise: find the greatest common divisor of two integers.

E.g., if $n = 22$, $m = 33$, $\gcd(n, m) = 11$.

Note: there are very efficient ways to do this.
We'll not do it efficiently today.

Idea (inefficient): try all possible divisors,
keep the largest one.

possible divisors of n, m ?

$$d = 1, 2, 3, \dots \underbrace{\min(n, m)}$$

Test for d being a common divisor?

$$(n \bmod d == 0 \text{ & } m \bmod d == 0)$$

∅ if we start from $\min(n, m)$ & work
backwards, can stop as soon as the
test passes.