

The background of the slide features a light gray circuit board pattern with various traces and circular components. A solid dark gray horizontal band runs across the middle of the image, serving as a background for the text.

CMSC 131

Fall 2018

Announcements

- Project #7 has been posted

Example: Factorial

Recall:

$$5! = 5 * 4 * 3 * 2$$

Code it up with loop

Code it up using recursion

What is the running time (Big-O) for each?

Which one is likely to be faster in practice?

Example: Fibonacci Sequence

1, 1, 2, 3, 5, 8, 13, 21, 34, ...

Write this method recursively:

```
// returns the nth Fibonacci number  
int fib(int n) {...}
```

What's the running time?

How does this compare to iterative solution?

Can the recursion be improved?

Example: Exponentiation

Pretend there is no exponentiation function in Java.

Let's code this up recursively:

```
// returns  $a^b$   
// assume a, b are non-negative  
int power(int a, int b) {...}
```