

Loops

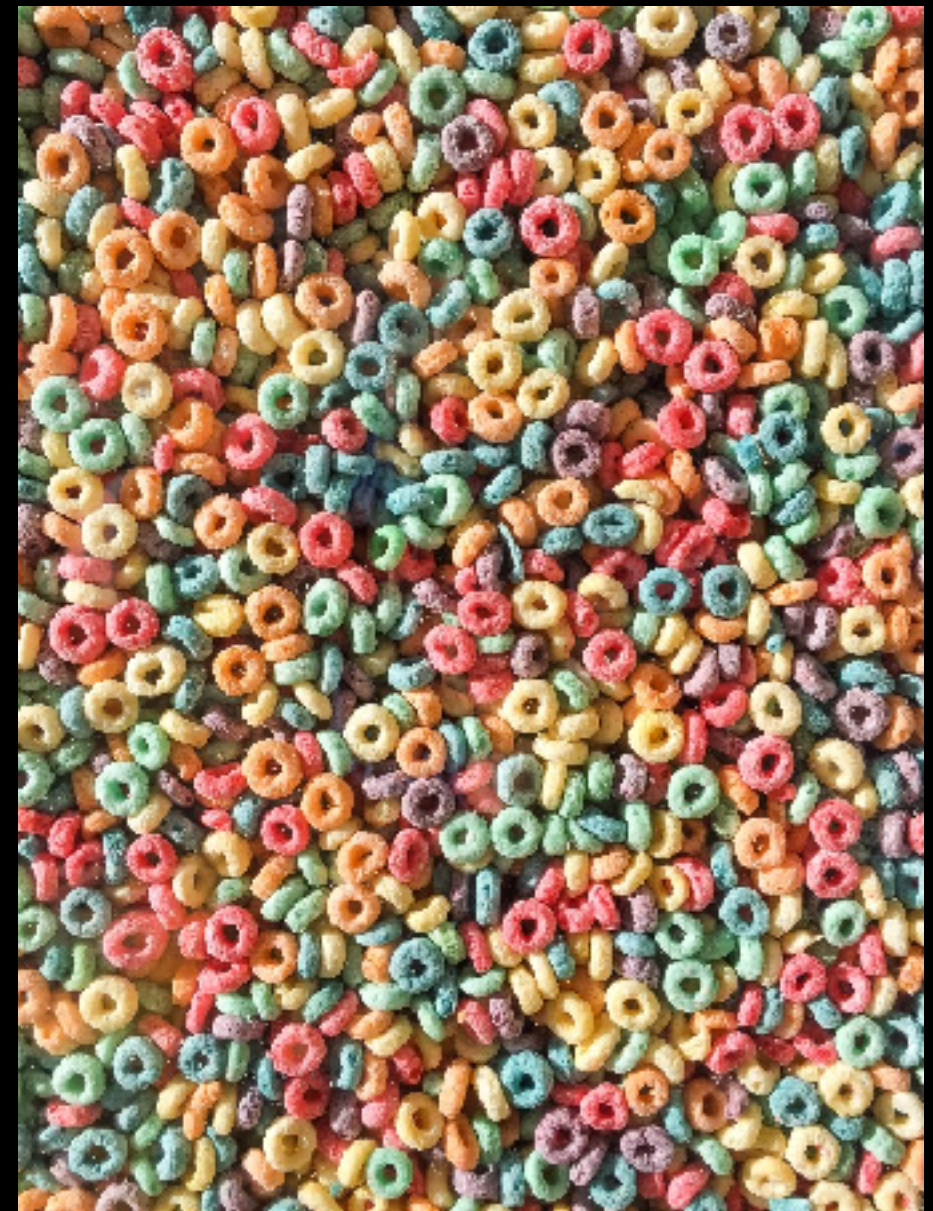
How to do more with less code

What will we learn today?

- ▶ What is a loop?
- ▶ What is a `while` loop?
- ▶ What is a `for` loop?
- ▶ What is the syntax of a `while/for` loop in JS?

What is a loop?

What do you think of when
you see the word loop?



What is a loop?

- ▶ A sequence of code that is **repeated** until a certain **condition is met**



How to brush your teeth?



How to brush your teeth?

move toothbrush left and right



How to brush your teeth?

move toothbrush left and right

move toothbrush left and right



How to brush your teeth?



move toothbrush left and right

move toothbrush left and right

move toothbrush left and right

How to brush your teeth?



move toothbrush left and right

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How to brush your teeth?



move toothbrush left and right

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How to brush your teeth?



move toothbrush left and right

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move toothbrush left and right

move toothbrush left and right



```
console.log("hello, world!");  
console.log("hello, world!");  
console.log("hello, world!");  
console.log("hello, world!");  
console.log("hello, world!");
```



```
let i = 0;  
  
while(i < 5) {  
  console.log("hello, world!");  
  i++;  
}
```

What is a loop?

- ▶ A sequence of code that is **repeated** until a certain **condition is met**

How many times do we do that?



- While teeth are dirty
- For x number of times

How to brush your teeth?



move to brush left and right
move toothbrush left and right
move toothbrush left and right
move toothbrush left and right
move toothbrush left and right
move toothbrush left and right



How to brush your teeth?



while teeth are dirty

move toothbrush left and right

How to brush your teeth?



do for 6 times

move toothbrush left and right

What is a **while**
loop?

What is a `while` loop?

- ▶ While a condition is true, run code.
 - ▶ e.g., while a counter is less than 5, while the player is still alive

What is a **while** loop?

```
let i = 0;

while (i < 3) {

    console.log("hello, world!");

    i++;

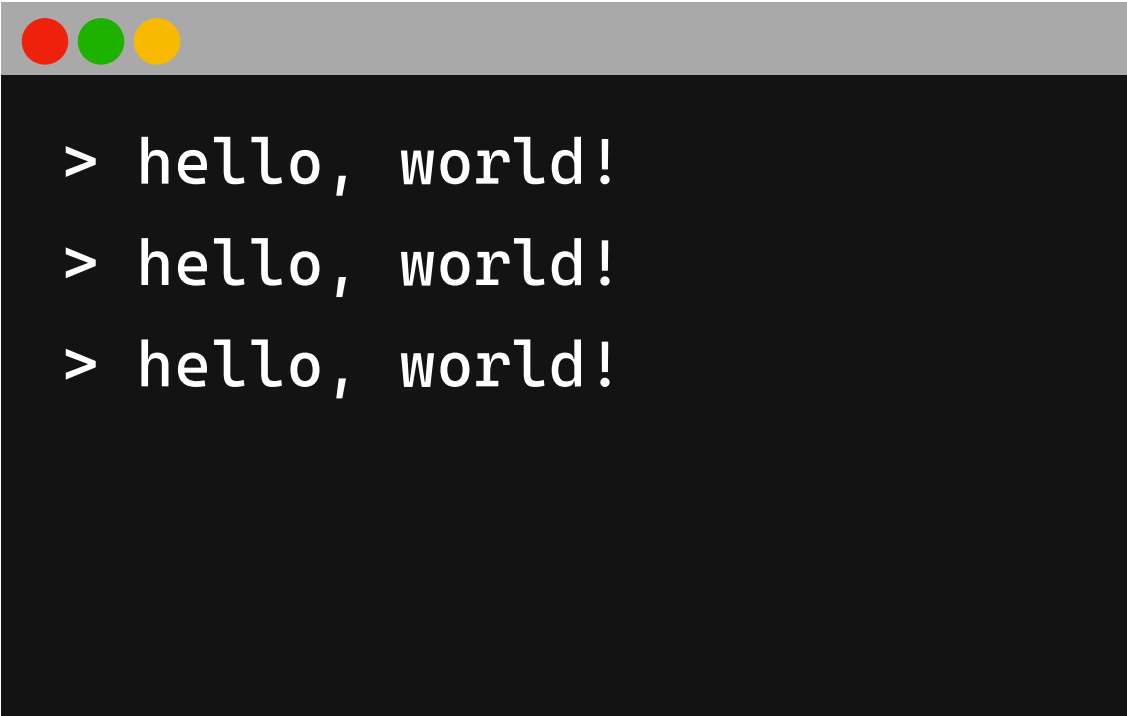
}
```

What is a **while** loop?

```
let i = 0;

while (i < 3) {
  console.log("hello, world!");

  i++;
}
```



A terminal window with a gray title bar and three colored window control buttons (red, green, yellow) on the left. The terminal has a dark gray background and displays the output of the code: three lines of "hello, world!" each preceded by a prompt character ">".

```
> hello, world!
> hello, world!
> hello, world!
```


What is a **while** loop?

```
let i = 0;
```

```
i = 0
```

```
while (i < 3) {  
  console.log("hello, world!");  
  i++;  
}
```

Declare a variable `i`
and assign it a value,
`0`.

That means we start
counting at `0`.

Why do we start at 0?

What is a **while** loop?

```
let i = 0;  
  
while (i < 3) {  
    console.log("hello, world!");  
    i++;  
}
```

i = 0

Check if i is less than 3

What is a **while** loop?

```
let i = 0;  
while (i < 3) {  
  console.log("hello, world!");  
  i++;  
}
```

i = 0



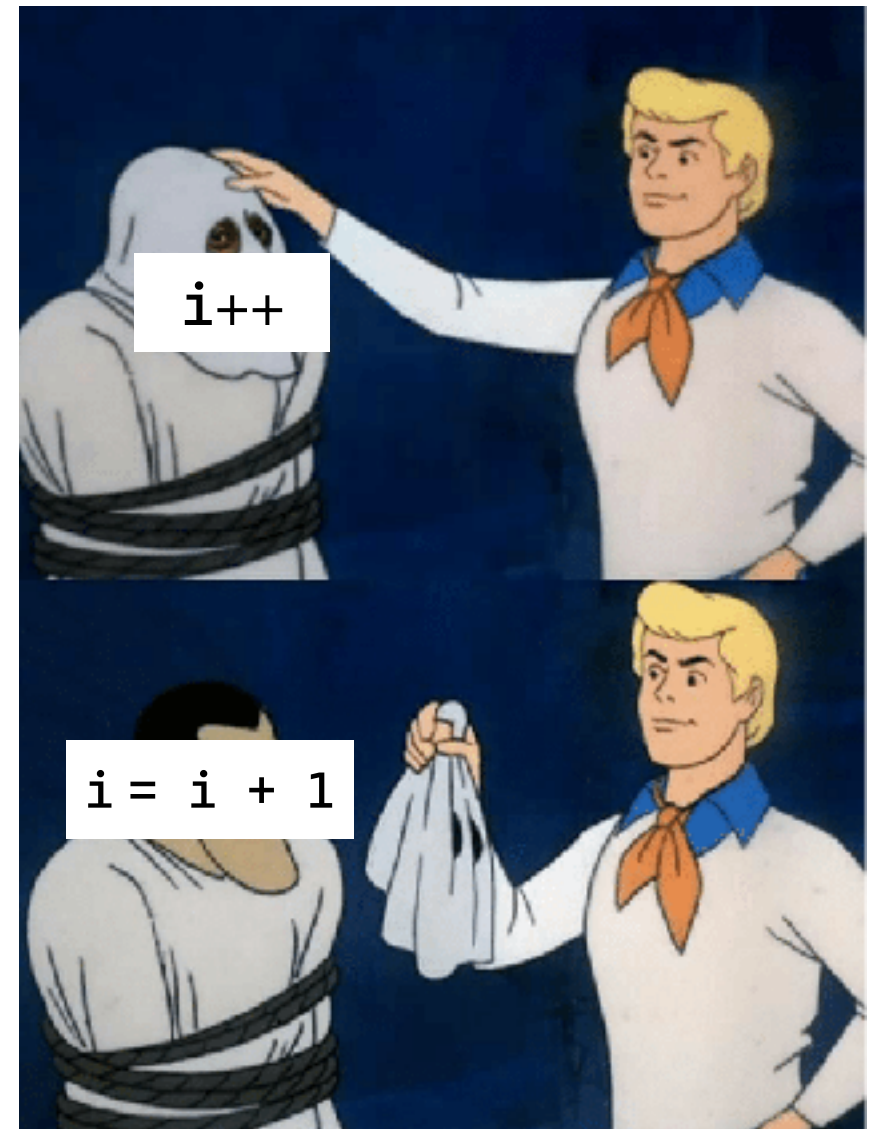
> hello, world!

What is a **while** loop?

```
let i = 0;  
  
while (i < 3) {  
  console.log("hello, world!");  
  i++;  
}
```

i = 0

What is i++?



What is a **while** loop?

```
let i = 0;  
while (i < 3) {  
  console.log("hello, world!");  
  i++;  
}
```

i = 1

What is i++?

i = i + 1

What is the value of
i now?

What is a **while** loop?

```
let i = 0;  
  
while (i < 3) {  
  console.log("hello, world!");  
  i++;  
}
```

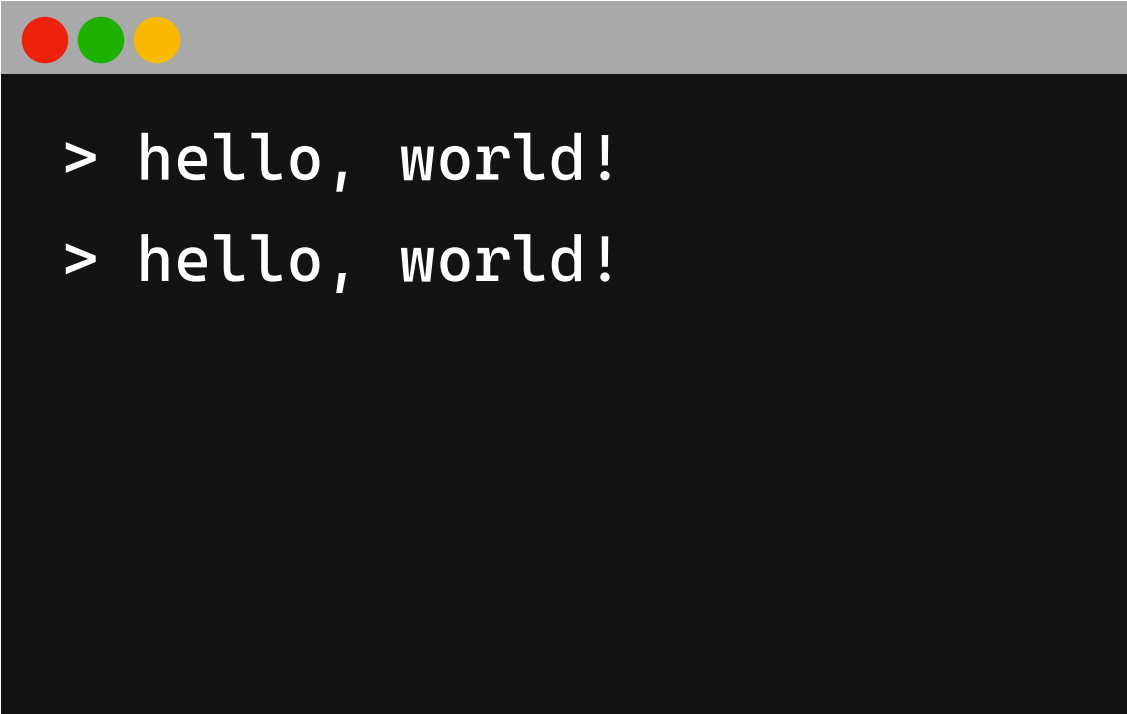
i = 1

Check if i is less than 3

What is a **while** loop?

```
let i = 0;  
while (i < 3) {  
  console.log("hello, world!");  
  i++;  
}
```

i = 1



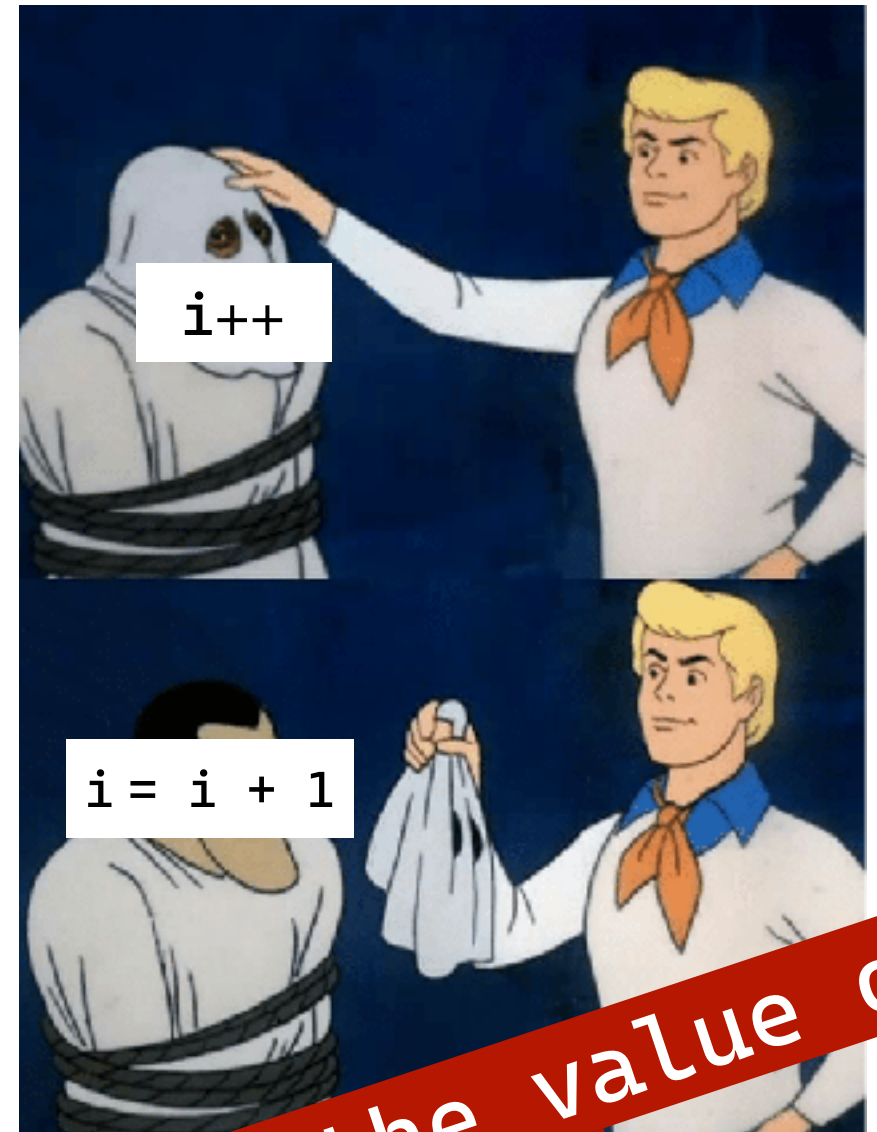
A terminal window with a dark background and a light gray title bar. The title bar has three colored buttons (red, green, yellow) on the left. The terminal displays two lines of text, each preceded by a prompt character '>':

```
> hello, world!  
> hello, world!
```


What is a **while** loop?

```
let i = 0;  
while (i < 3) {  
  console.log("hello, world!");  
  i++;  
}
```

i = 2



What is the value of
i now?

What is a **while** loop?

```
let i = 0;  
  
while (i < 3) {  
  console.log("hello, world!");  
  i++;  
}
```

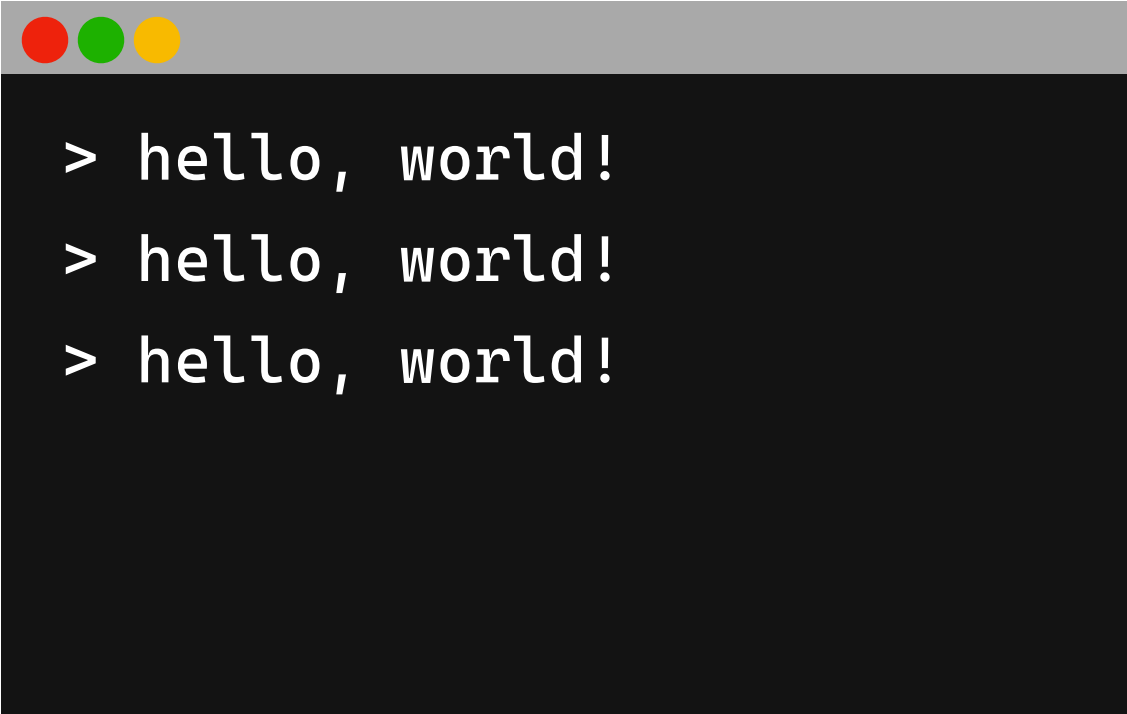
i = 2

Check if i is less than 3

What is a **while** loop?

```
let i = 0;  
while (i < 3) {  
  console.log("hello, world!");  
  i++;  
}
```

i = 2



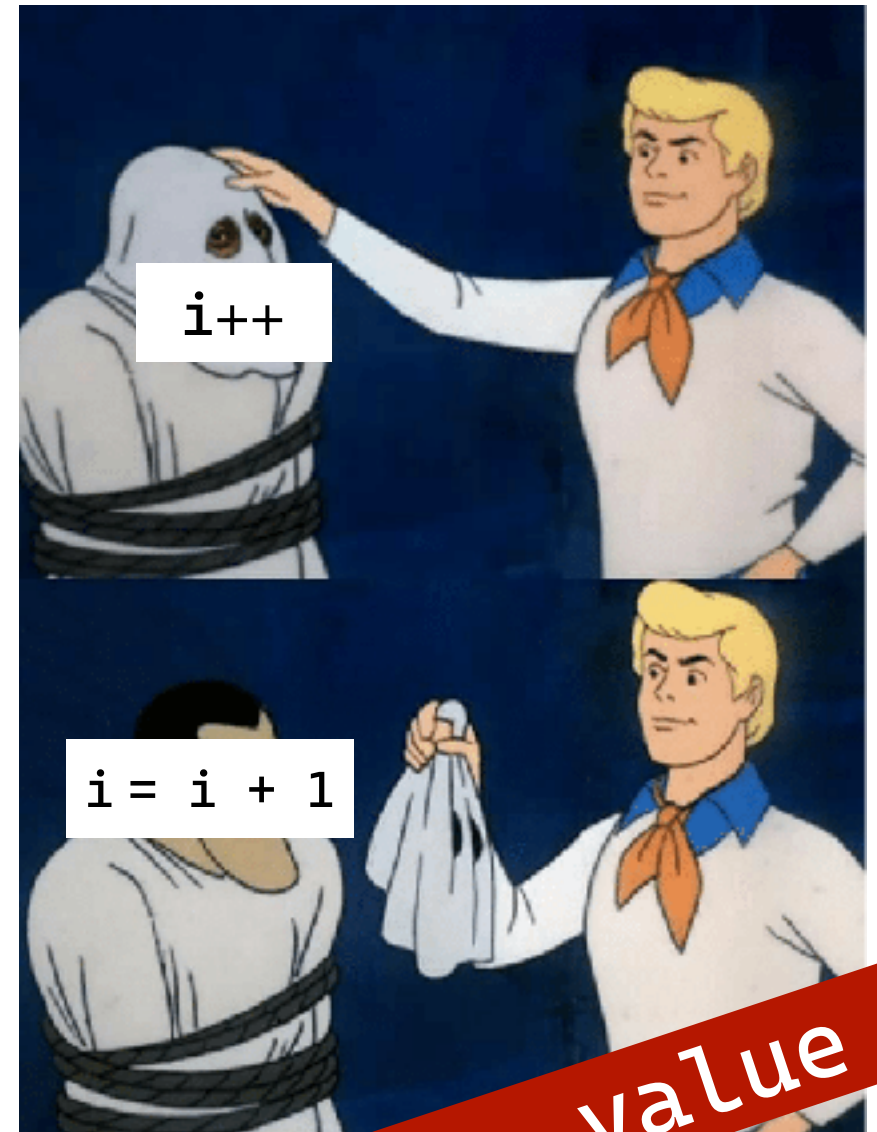
A terminal window with a dark background and a light gray title bar. The title bar contains three colored circles (red, green, yellow) on the left. The terminal displays three lines of output, each preceded by a prompt character '>':

```
> hello, world!  
> hello, world!  
> hello, world!
```

What is a **while** loop?

```
let i = 0;  
while (i < 3) {  
  console.log("hello, world!");  
  i++;  
}
```

i = 3



What is the value of
i now?

What is a **while** loop?

```
let i = 0;  
  
while (i < 3) {  
    console.log("hello, world!");  
    i++;  
}
```

i = 3

Check if i is less than 3

Is 3 less than 3?



What is a **while** loop?

```
let i = 0;  
  
while (i < 3) {  
    console.log("hello, world!");  
    i++;  
}
```

i = 3

Check if i is less than 3

Is 3 less than 3?



Pop quiz!

```
let i = true;
while (i === true) {
  console.log("DO NOT RUN THIS");
}
```

Why shouldn't we do this?

What is a **for**
loop?

What is a `for` loop?

- ▶ Run code `for` a specified number of times.

What is a **for** loop?

Can you guess what does each part of the loop do?

```
for (let i = 0; i < 3; i++){  
    console.log("hello, world!");  
}
```

What is a **for** loop?

```
for (let i = 0; i < 3; i++){  
    console.log(i);  
}
```

Can you guess what does each part of the loop do?

let i = 0;

i < 3;

i++

while

```
while (condition) {  
    //your code here  
};
```

```
•  
•  
•    let i = 0;  
•  
•  
•    while (i < 10) {  
•        console.log(i);  
•  
•        i++;  
•    };  
•  
•  
•  
•  
•  
•
```

for

```
for (start from; end at; increment) {  
    //your code here  
};
```

.....

```
for (let i = 0; i < 10; i++) {  
    console.log(i);  
};
```

while vs for

```
while (condition) {  
    //your code here  
};
```

Used when we do not know how many times a code would run

*Stop when a **condition** is met*

```
•  
• for (start from; end at; increment) {  
•  
•    //your code here  
•  
• };  
•  
•
```

*Used when we want a code to run a **specified** number of times*

*Stop when code has run **specified** number of times*