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Simplifying JavaScript

Writing Modern JavaScript with ES5, ES6, and Beyond

The Pragmatic Bookshelf

Raleigh, North Carolina

The Pragmatic Programmers

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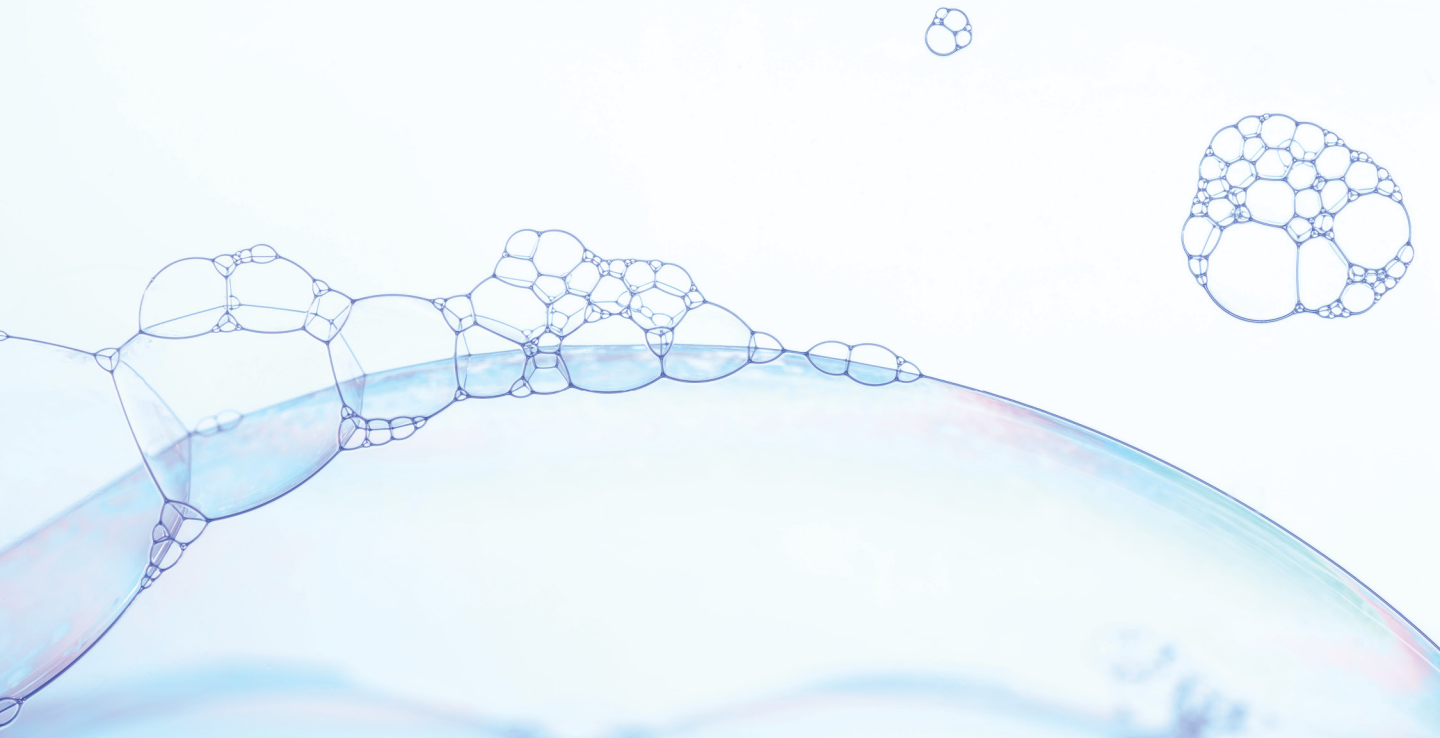

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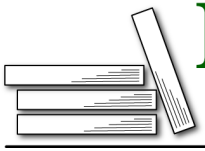

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Tip 33

Reduce Complexity with Arrow Functions

In this tip, you'll learn how to use arrow functions to destructure arguments, return objects, and construct higher-order functions.

You explored arrow functions once in Tip 20, *Simplify Looping with Arrow Functions*, on page ?. It's time to take a deeper dive.

As a reminder, arrow functions allow you to remove extraneous information, such as the `function` declaration, parentheses, `return` statements, even curly braces. Now you're going to see how to handle a few more concepts that you've just learned, such as destructuring. You'll also get an introduction to new ideas that you'll explore further in future tips.

Let's begin with destructuring. You're going to take an object that has a first and last name and combine them in a string. You can't get more simple than that.

functions/arrow/problem.js

```
const name = {
  first: 'Lemmy',
  last: 'Kilmister',
};

function getName({ first, last }) {
  return `${first} ${last}`;
}
```

That should be very easy to convert to an arrow function. Remove everything except the parameter and the template literal. Add a fat arrow, `=>`, and you should be done.

Not quite. Everything is the same except the parameters. When you're using any kind of special parameter action—destructuring, rest parameters, default parameters—you still need to include the parentheses.

This sounds trivial, but it will trip you up if you aren't aware. It's hard for the JavaScript engine to know if you're performing a function declaration and not an object declaration. You'll get an error like this:

functions/arrow/close.js

```
const getName = { first, last } => `${first} ${last}`;

// Error: Unexpected token '=>'. Expected ';' after variable declaration
```

And that's if you're lucky. If you try this in a Node.js REPL, it will just hang like you forgot to add a closing curly brace. It can be very confusing.

The solution is simple: If you're using any special parameters, just wrap the parameter in parentheses as you normally would.

functions/arrow/arrow.js

```
const comic = {
  first: 'Peter',
  last: 'Bagge',
  city: 'Seattle',
  state: 'Washington',
};

const getName = ({ first, last }) => `${first} ${last}`;
getName(comic);
// Peter Bagge
```

If you're returning an object, you have to be careful when omitting the return statement. Because an arrow function can't tell whether the curly braces are for an object or to wrap a function body, you'll need to indicate the return object by wrapping the whole thing in parentheses.

functions/arrow/arrow.js

```
const getFullName = ({ first, last }) => ({ fullName: `${first} ${last}` });
getFullName(comic);
// { fullName: 'Peter Bagge' }
```

It gets even better. When you return a value using parentheses, you aren't limited to a single line. You can return multi-line items while still omitting the return statement.

functions/arrow/arrow.js

```
const getNameAndLocation = ({ first, last, city, state }) => ({
  fullName: `${first} ${last}`,
  location: `${city}, ${state}`,
});
getNameAndLocation(comic);
// {
//   fullName: 'Peter Bagge',
//   location: 'Seattle, Washington'
// }
```

Finally, arrow functions are great ways to make higher-order functions—functions that return other functions. You'll explore higher-order functions in upcoming tips, so for now, let's just see how to structure them.

Because a higher-order function is merely a function that returns another function, the initial parameter is the same. And you can return a function from the body like you always would.

functions/arrow/problem.js

```
const discounter = discount => {
  return price => {
    return price * (1 - discount);
  };
};
const tenPercentOff = discounter(0.1);
tenPercentOff(100);
// 90
```

Of course, because the return value is another function, you can leverage the implicit return to return the function without even needing extra curly braces. Try it out.

functions/arrow/arrow.js

```
const discounter = discount => price => price * (1 - discount);

const tenPercentOff = discounter(0.1);
tenPercentOff(100);
// 90;
```

If you're anything like me, you're probably already forgetting all about higher-order functions. When are you going to use them? Turns out, they can be very helpful. Not only are they great ways to lock in parameters, but they'll also help you take some of the ideas you've already seen—array methods, rest parameters—even further.

In all the examples, you invoked the higher-order functions by first assigning the returned function to a variable before calling that with another parameter. That's not necessary. You can call one function after the other by just adding the second set of parameters in parentheses right after the first. This essentially turns a higher-order function into a single function with two different parameter sets.

functions/arrow/arrow.js

```
discounter(0.1)(100);
// 90
```

In the next tip, you'll see why using higher-order functions to keep parameters separate is such a game changer by learning how to create single responsibility parameters.