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How To Traverse the DOM

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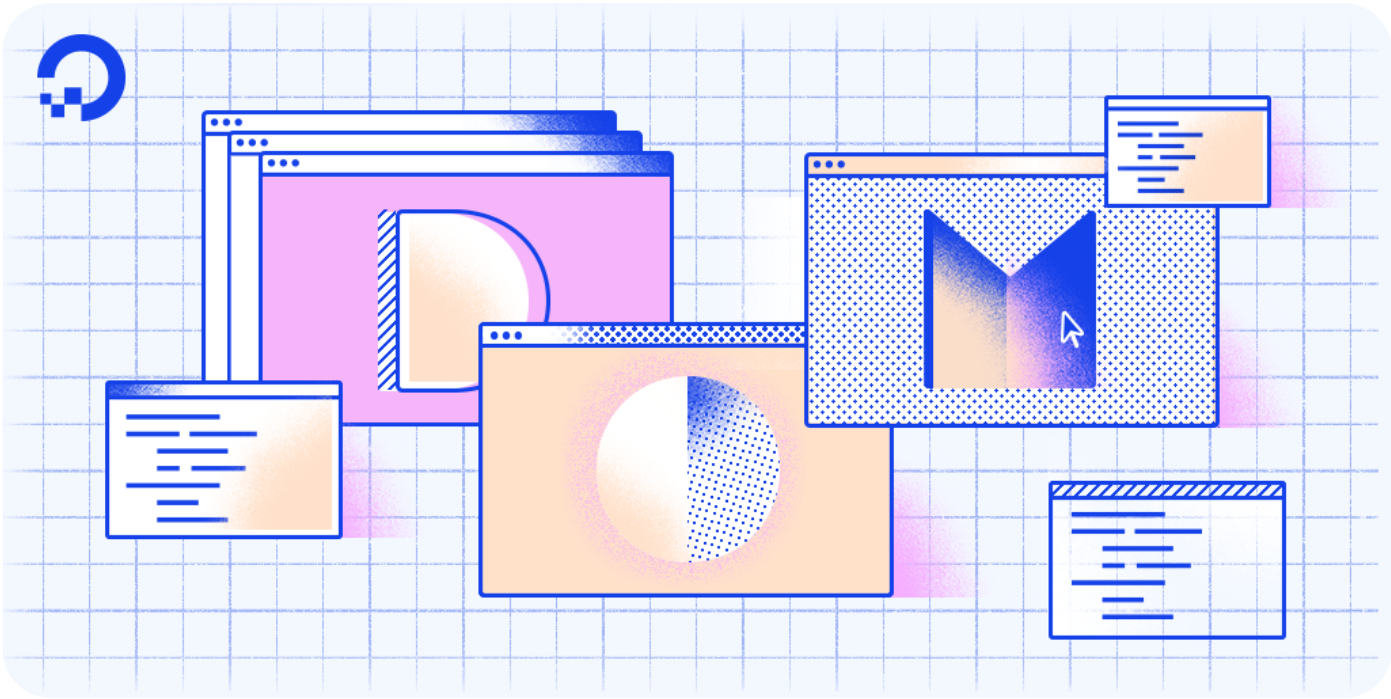
JavaScript Development

By Tania Rascia



Introduction

The previous tutorial in this series, How to Access Elements in the DOM, covers how to use the built-in methods of the `document` object to access HTML elements by ID, class, tag name, and query selectors. We know that the DOM is structured as a tree of nodes with the `document` node at the root and every other node (including elements, comments, and text nodes) as the various branches.

In this tutorial, we will go over how to traverse the DOM (also known as walking or navigating the DOM) with parent, child, and sibling properties.

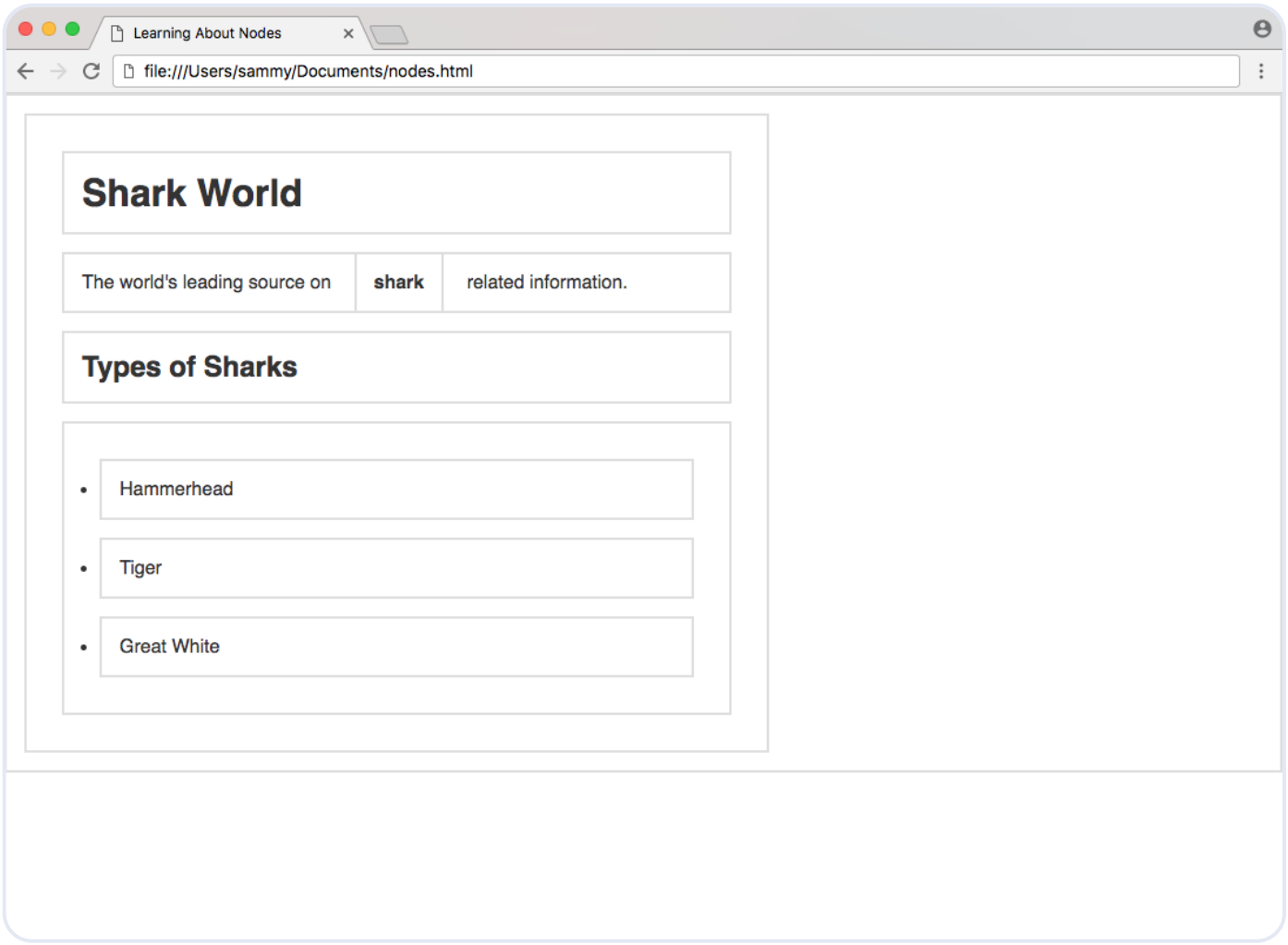
Setup

To begin, we will create a new file called `nodes.html` comprised of the following code.

nodes.html

Copy

```
<!DOCTYPE html>
<html>

<head>
  <title>Learning About Nodes</title>

  <style>
    * { border: 2px solid #dedede; padding: 15px; margin: 15px; }
    html { margin: 0; padding: 0; }
    body { max-width: 600px; font-family: sans-serif; color: #333; }
  </style>
</head>

<body>
  <h1>Shark World</h1>
  <p>The world's leading source on <strong>shark</strong> related information.</p
  <h2>Types of Sharks</h2>
  <ul>
    <li>Hammerhead</li>
    <li>Tiger</li>
    <li>Great White</li>
  </ul>
</body>

<script>
  const h1 = document.getElementsByTagName('h1')[0];
  const p = document.getElementsByTagName('p')[0];
  const ul = document.getElementsByTagName('ul')[0];
</script>

</html>
```



In this example website, we have an HTML document with a few elements. Some basic CSS has been added in a `style` tag to make each element obviously visible, and a few variables have been created in the `script` for ease of access of a few elements. Since there is only one of each `h1`, `p`, and `ul`, we can access the first index on each respective `getElementsByTagName` property.

Root Nodes

The `document` object is the root of every node in the DOM. This object is actually a property of the `window` object, which is the global, top-level object representing a tab in the browser. The `window` object has access to such information as the toolbar, height and width of the window, prompts, and alerts. The `document` consists of what is inside of the inner `window`.

Property	Node	Node Type
`document`	`#document`	`DOCUMENT_NODE`
`document.documentElement`	`html`	`ELEMENT_NODE`
`document.head`	`head`	`ELEMENT_NODE`
`document.body`	`body`	`ELEMENT_NODE`

Since the `html`, `head`, and `body` elements are so common, they have their own properties on the `document`.

Open the *Console* in DevTools and test each of these four properties by submitting them and viewing the output. You can also test `h1`, `p`, and `ul` which will return the elements due to the variables we added in the `script` tag.

Parent Nodes

The nodes in the DOM are referred to as parents, children, and siblings, depending on their relation to other nodes. The **parent** of any node is the node that is one level above it, or closer to the `document` in the DOM hierarchy. There are two properties to get the parent — `parentNode` and `parentElement`.

Property	Gets
`parentNode`	Parent Node
`parentElement`	Parent Element Node

- `body` is the parent of `h1`, `h2`, `p` and `ul`, but not `li`, since `li` is two levels down from `body`.

We can test what the parent of our `p` element is with the `parentNode` property. This `p` variable comes from our custom `document.getElementsByTagName('p')[0]` declaration.

```
> p.parentNode;
```

Copy

Output

```
► <body>...</body>
```

The parent of `p` is `body`, but how can we get the grandparent, which is two levels above? We can do so by chaining properties together.

```
> p.parentNode.parentNode;
```

Copy

Output

```
► <html>...</html>
```

Using `parentNode` twice, we retrieved the grandparent of `p`.

There are properties to retrieve the parent of a node, but only one small difference between them, as demonstrated in this snippet below.

```
> // Assign html object to html variable
> const html = document.documentElement;
>
> console.log(html.parentNode); // > #document
> console.log(html.parentElement); // > null
```

Copy

The parent of almost any node is an element node, as text and comments cannot be parents to other nodes. However, the parent of `html` is a document node, so `parentElement` returns `null`. Generally, `parentNode` is more commonly used when traversing the DOM.

Property	Gets
`childNodes`	Child Nodes
`firstChild`	First Child Node
`lastChild`	Last Child Node
`children`	Element Child Nodes
`firstElementChild`	First Child Element Node
`lastElementChild`	Last Child Element Node

The `childNodes` property will return a live list of every child of a node. You might expect the `ul` element to get three `li` elements. Let's test what it retrieves.

```
> ul.childNodes;
```

Copy

```
Output
► (7) [text, li, text, li, text, li, text]
```

In addition to the three `li` elements, it also gets four text nodes. This is because we wrote our own HTML (it was not generated by JavaScript) and the indentation between elements is counted in the DOM as text nodes. This is not intuitive, as the *Elements* tab of DevTools strips out white space nodes.

If we attempted to change the background color of the first child node using the

```
>
```
Copy

```
Output
Uncaught TypeError: Cannot set property 'background' of undefined
```

The `children`, `firstElementChild` and `lastElementChild` properties exist in these types of situations to retrieve only the element nodes. `ul.children` will only return the three `li` elements.

Using `firstElementChild`, we can change the background color of the first `li` in the `ul`.

```
> ul.firstElementChild.style.background = 'yellow';
```
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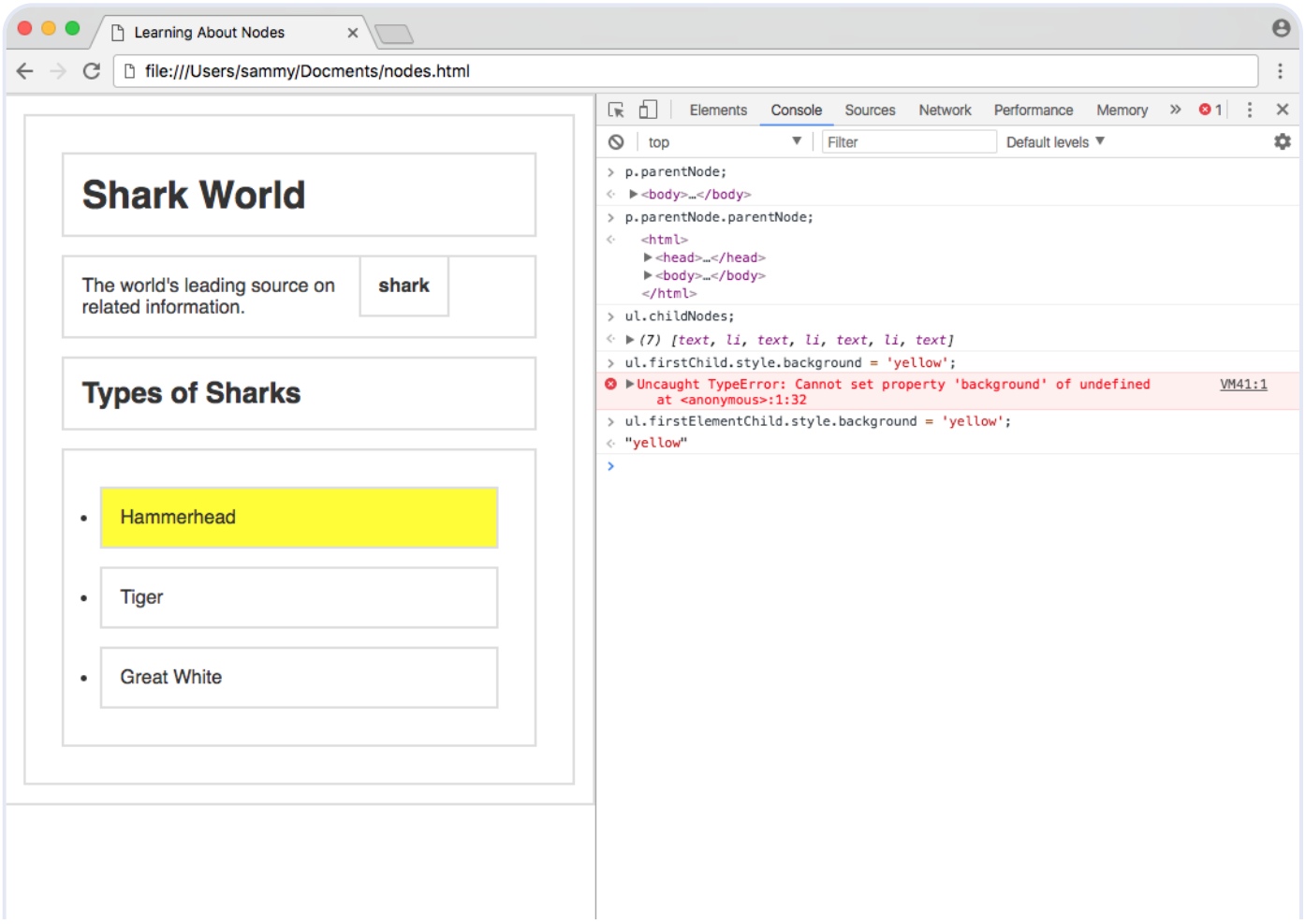
When you run the code above, your webpage will be updated to modify the background color.



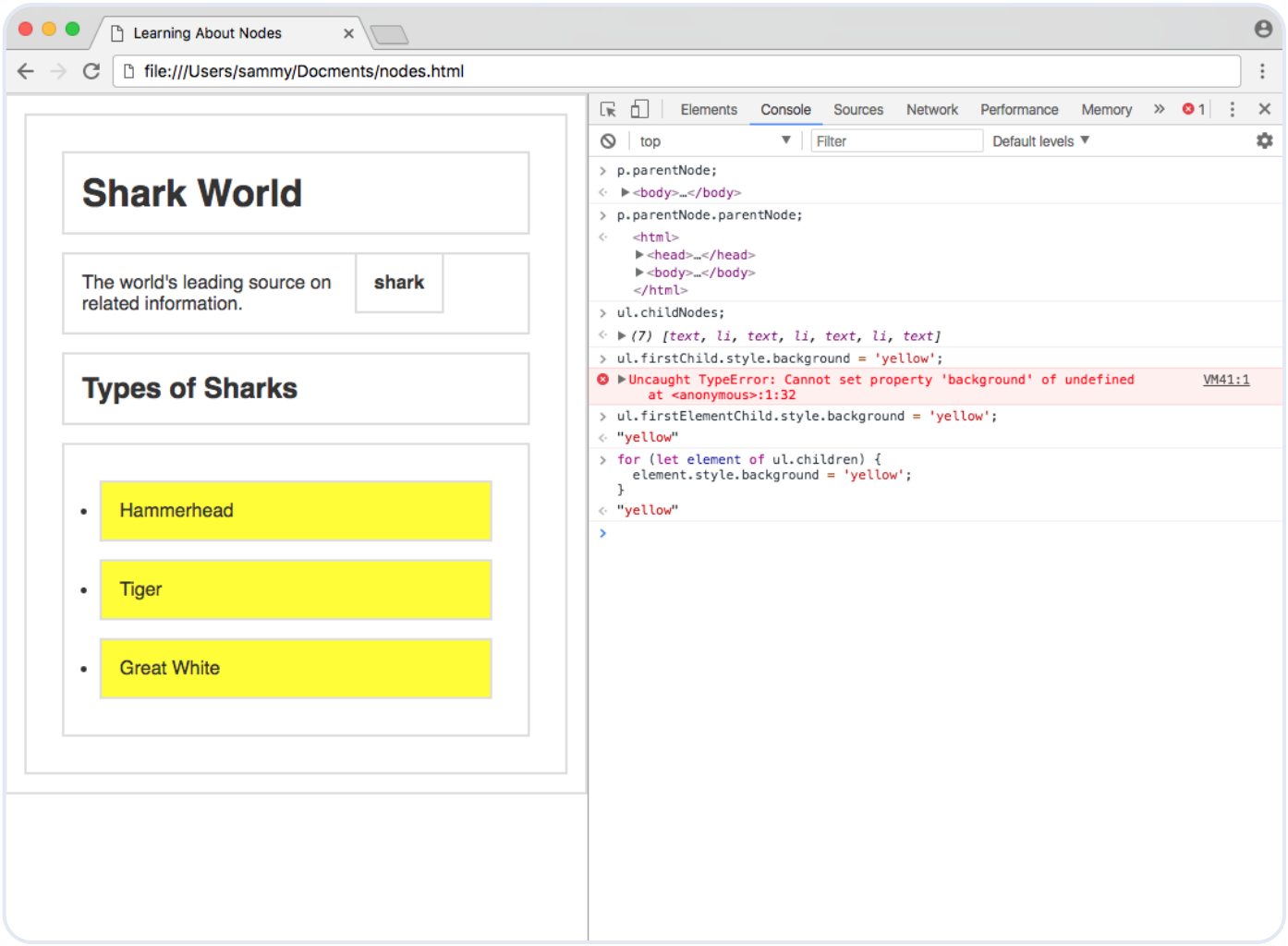
select all nodes are more likely to be used, as white-space newlines and indentation will not exist in this case.

A `for...of` loop can be used to iterate through all `children` elements.

```
> for (let element of ul.children) {
>   element.style.background = 'yellow';
> }
```

Copy

Now, each child element will have a yellow background.



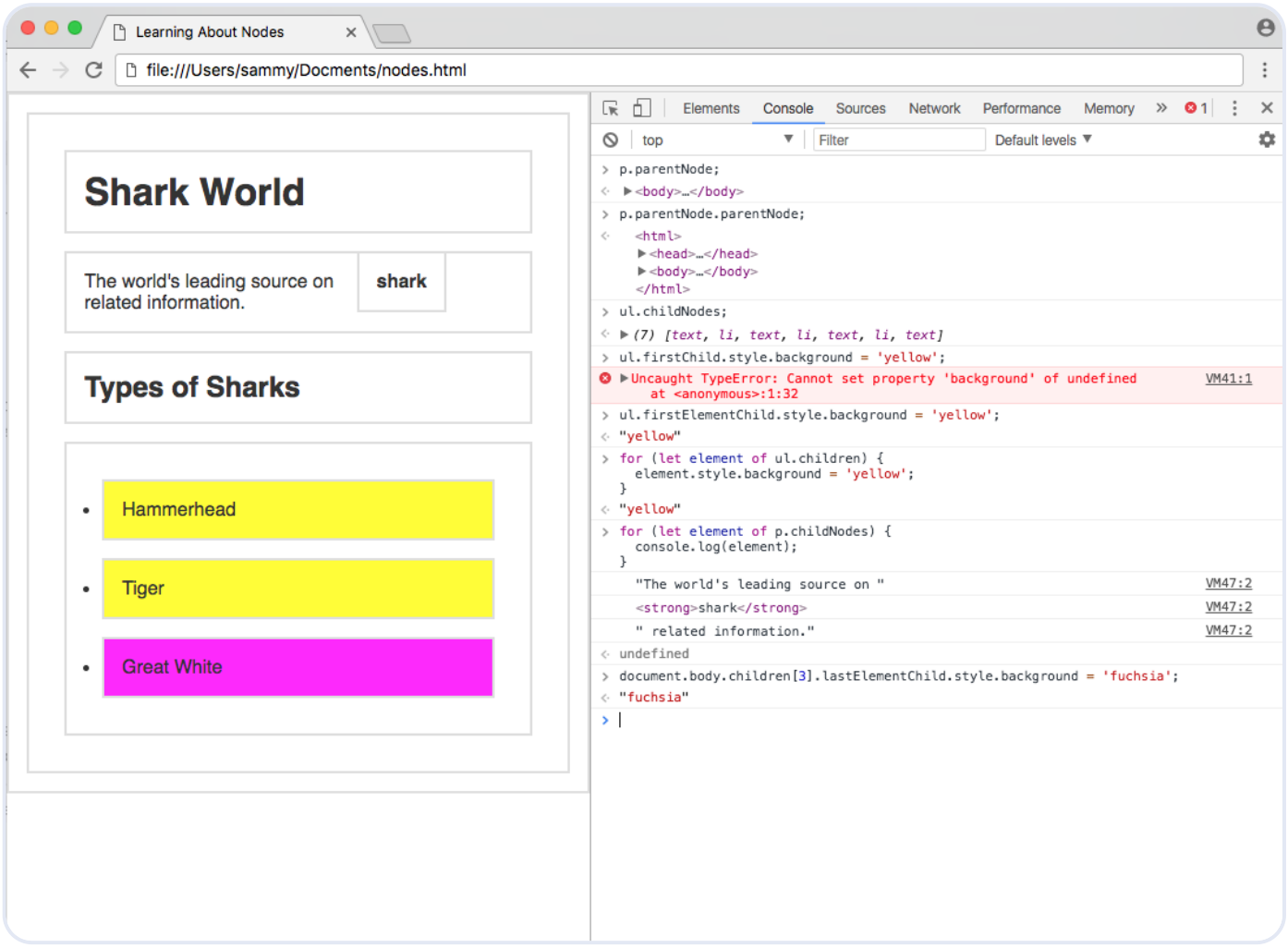
Since our `p` element has both text and elements inside of it, the `childNodes` property is helpful for accessing that information.

```
  "The world's leading source on "
  <strong>shark</strong>
  " related information."
```

`childNodes` and `children` do not return arrays with all the Array properties and methods, but they appear and behave similarly to JavaScript arrays. You can access nodes by index number, or find their `length` property.

```
> document.body.children[3].lastElementChild.style.background = 'fuchsia'
```
Copy

The above code will find the last element child (`li`) of the fourth child element (`ul`) of `body` and apply a style.



Using parent and child properties, you can retrieve any node in the DOM.

The **siblings** of a node are any node on the same tree level in the DOM. Siblings do not have to be the same type of node - text, element, and comment nodes can all be siblings.

Property	Gets
`previousSibling`	Previous Sibling Node
`nextSibling`	Next Sibling Node
`previousElementSibling`	Previous Sibling Element Node
`nextElementSibling`	Next Sibling Element Node

Sibling properties work the same way as the children nodes, in that there is a set of properties to traverse all nodes, and a set of properties for only element nodes. `previousSibling` and `nextSibling` will get the next node that immediately precedes or follows the specified node, and `previousElementSibling` and `nextElementSibling` will only get element nodes.

In our `nodes.html` example, let's select the middle element of `ul`.

```
> const tiger = ul.children[1];
```

Copy

Since we created our DOM from scratch and not as a JavaScript web app, we will need to use the element sibling properties to access the previous and next element nodes, as there is white space in the DOM.

```
> tiger.nextElementSibling.style.background = 'coral';
> tiger.previousElementSibling.style.background = 'aquamarine';
```

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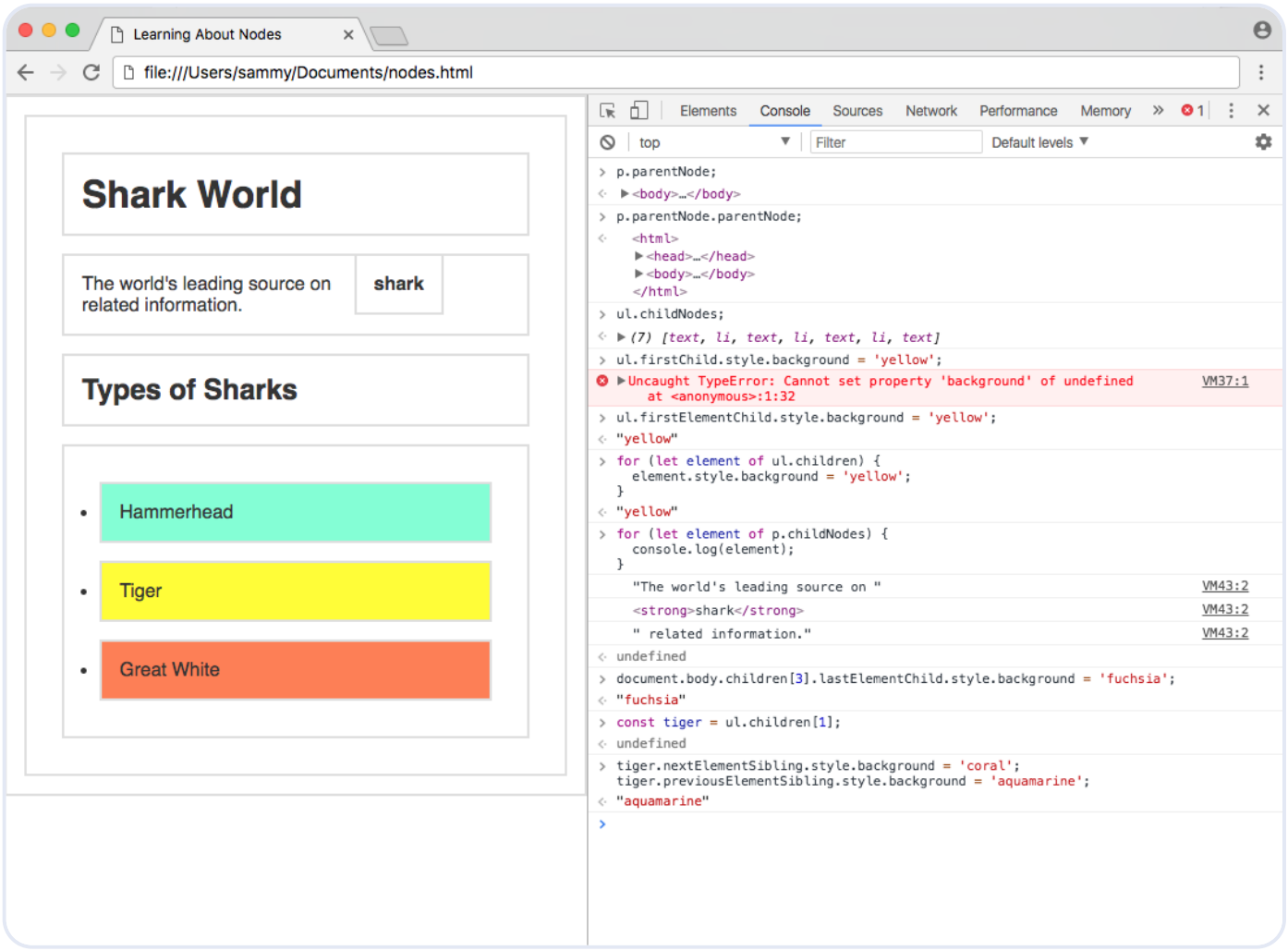
Running this code should have applied `coral` to the background of `Hammerhead` and



Sibling properties can be chained together, just like parent and node properties.

Conclusion

In this tutorial, we covered how to access the root nodes of every HTML document and how to walk the DOM tree through parent, child, and sibling properties.

With what you learned in How to Access Elements in the DOM and this tutorial, you should be able to confidently access any node in the DOM of any website.

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Tutorial Series: Understanding the DOM – Document Object Model

The Document Object Model, usually referred to as the DOM, is an essential part of making websites interactive. It is an interface that allows a programming language to manipulate the content, structure, and style of a website. JavaScript is the client-side scripting language that connects to the DOM in an internet browser.

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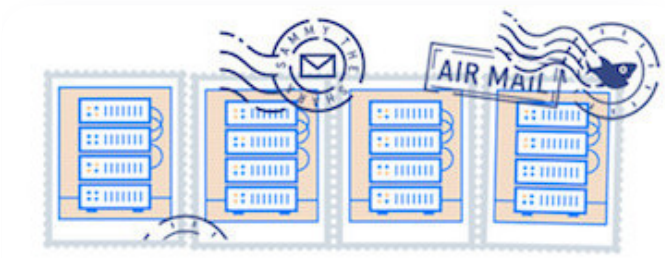

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