



DOM AND DHTML

MODIFYING WEB PAGES

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OUTLINE

- Document Object Model (DOM)
- Manipulating the DOM with JavaScript (DHTML)
 - Accessing DOM objects
 - DOM object properties
 - Modifying DOM objects



DOM AND DHTML

THE DOCUMENT OBJECT
MODEL

THE DOCUMENT OBJECT MODEL (DOM)

- Basically, a DOM is a parse tree
 - The browser builds a DOM from the HTML and CSS files for each page
 - You can create a DOM from any XML file, but HTML is the most common
- A DOM is a hierarchical data structure
 - Elements (tags)
 - Attributes
 - Attribute values
 - Text content

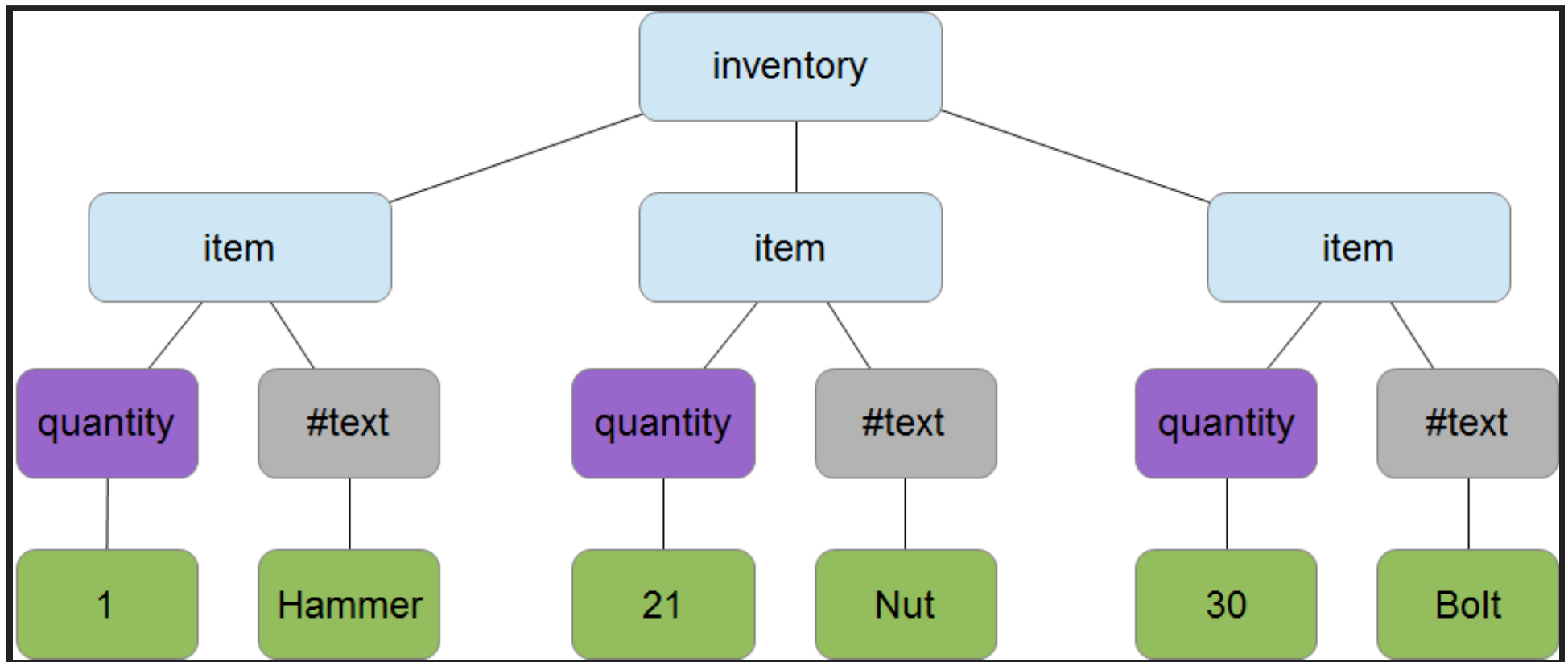
XML FILE

- Let's examine the DOM of this XML file:

```
<inventory>  
  <item quantity="1">Hammer</item>  
  <item quantity="21">Nut</item>  
  <item quantity="30">Bolt</item>  
</inventory>
```

XML FILE

- Let's examine the DOM of this XML file:



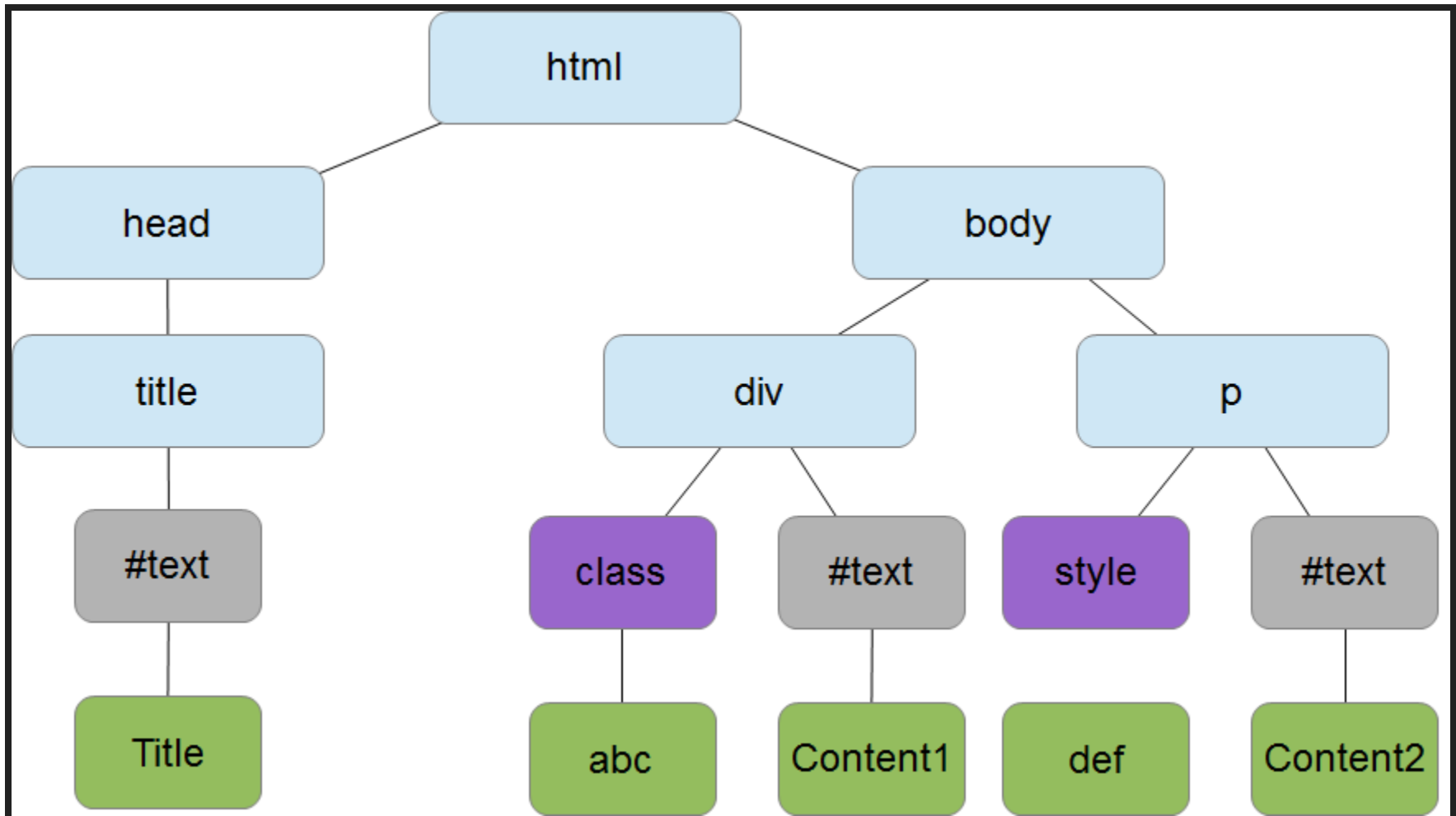
HTML FILE

- Let's examine the DOM of this HTML file:

```
<html>
  <head>
    <title>Title</title>
  </head>
  <body>
    <div class="abc">Content1</div>
    <p style="def">Content2</div>
  </body>
</html>
```

HTML FILE

- Let's examine the DOM of this HTML file:





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DOM AND DHTML

DYNAMIC HTML

DYNAMIC HTML (DHTML)

- Obtaining DOM objects:

```
window.onload = function() {  
    var div = document.getElementById("myDiv");  
    var divChild = div.getElementById("myP");  
    var allPs = document.getElementsByTagName("p");  
    var firstName = document.querySelector("#firstName"); // id  
    var comments = document.querySelectorAll(".comment"); // CSS class  
    var rows = document.querySelectorAll("tr"); // element r  
    var even = rows.querySelectorAll(":nth-child(2n)"); // pseudocla  
};
```

DYNAMIC HTML (DHTML)

- DOM object properties about the element:

```
window.onload = function() {
  var div = document.getElementById("myDiv");
  console.log(div.id);           // the unique ID for the element
  console.log(div.innerHTML);   // the content of the element, as HTML
  console.log(div.nodeName);    // the name of the HTML element (e.g. DIV)
  console.log(div.className);   // the CSS class(es) assigned to the element
  console.log(div.style);       // a dictionary with all the CSS properties
                                // (e.g. element.style.backgroundColor)
  console.log(div.clientWidth); // the width of the element in pixels
  console.log(div.clientHeight); // the height of the element in pixels
};
```

DYNAMIC HTML (DHTML)

- DOM object properties about the element's children:

```
window.onload = function() {  
  var div = document.getElementById("myDiv");  
  console.log(div.childNodes); // a NodeList of children  
  console.log(div.firstChild);  
  console.log(div.lastChild);  
  div.removeChild(div.lastChild);  
  div.replaceChild(newNode, div.lastChild);  
};
```

DYNAMIC HTML (DHTML)

- DOM object properties about the element's other relationships:

```
window.onload = function() {  
  var div = document.getElementById("myDiv");  
  console.log(div.parentNode);      // parent node of this element  
  console.log(div.nextSibling);     // next child with the same parent  
  console.log(div.previousSibling); // prev child with the same parent  
};
```

DYNAMIC HTML (DHTML)

- Attribute names and values:

```
window.onload = function() {  
  var img = document.getElementById("logo");  
  var attrib = img.getAttribute("alt");  
  console.log(attrib.name + ": " + attrib.value);  
};
```

DYNAMIC HTML (DHTML)

- Modifying DOM elements:

```
var div1 = document.getElementById("div1");
div1.innerHTML = 'Hi from JavaScript';

var div2 = document.getElementById("div2");
div2.innerHTML = '<p>Dynamic paragraph</p>';

var div3 = document.getElementById("div3");
div3.style.color = '#ff0000';
div3.style.width = '300px';
```

DYNAMIC HTML (DHTML)

- CSS Style attributes
 - Many CSS properties have dashes:
 - `border-radius: 10px;`
 - `margin-left: 0;`
 - This is invalid syntax, so camel case instead:
 - `div.style.borderRadius = '10px';`
 - `div.style.marginLeft = '0';`

WRAP-UP

- In this section, we learned about:
 - DOM
 - XML
 - HTML
 - Accessing DOM objects in JavaScript
 - DOM object attributes
 - Modifying DOM objects