

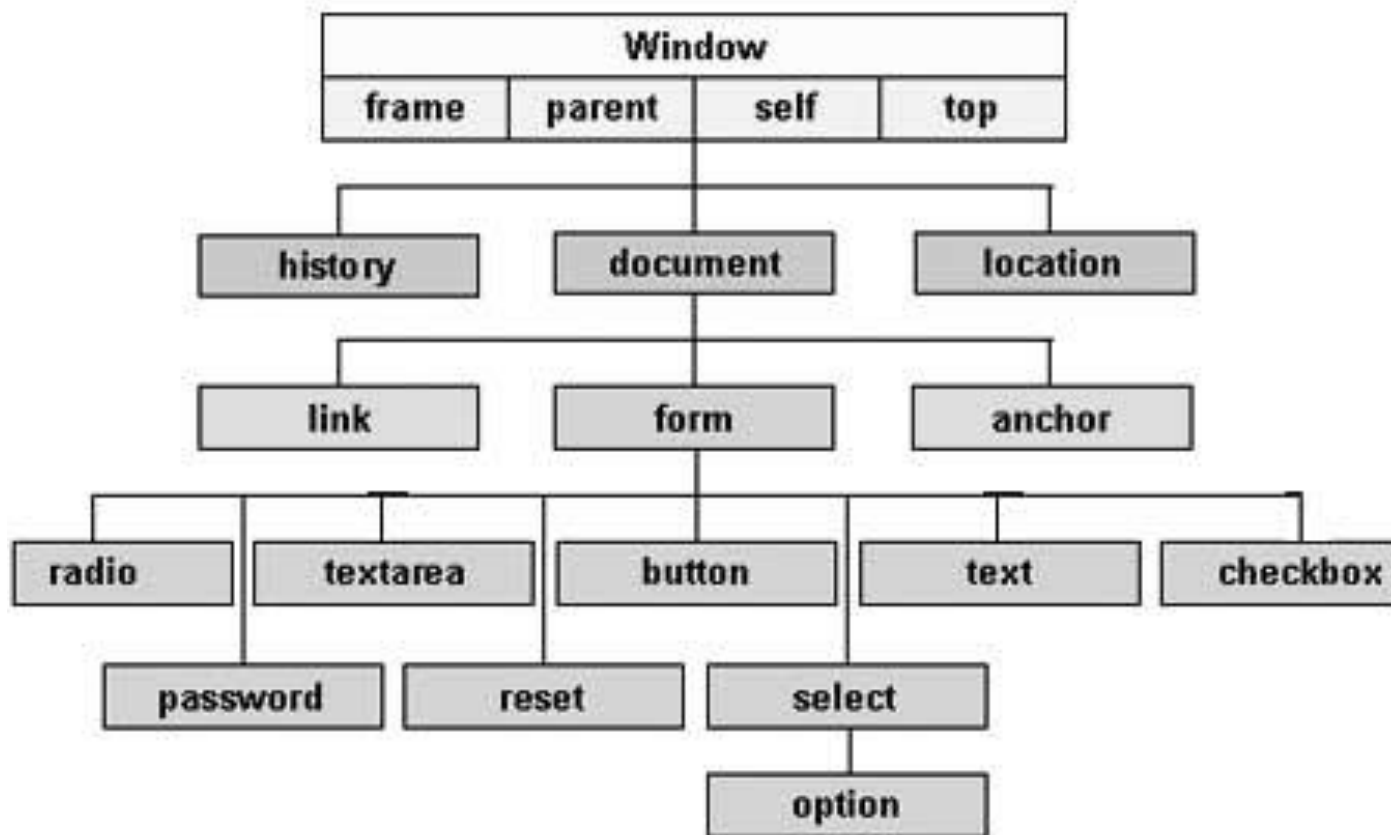
Auditory exercises 7

Internet programming

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Document Object Model



What is DOM?

A standard object model and
programming interface for HTML

It defines

HTML elements as objects

Attributes of all HTML elements

Methods for accessing HTML elements

Events for HTML elements

Finding HTML elements

Method	Description
<code>document.getElementById()</code>	Find an element by element id
<code>document.getElementsByTagName()</code>	Find elements by tag name
<code>document.getElementsByClassName()</code>	Find elements by class name



Modifying HTML elements

Method	Description
<i>element.innerHTML=</i>	Change the inner HTML of an element
<i>element.attribute=</i>	Change the attribute of an HTML element
<i>element.setAttribute(attribute,value)</i>	Change the attribute of an HTML element
<i>element.style.property=</i>	Change the style of an HTML element

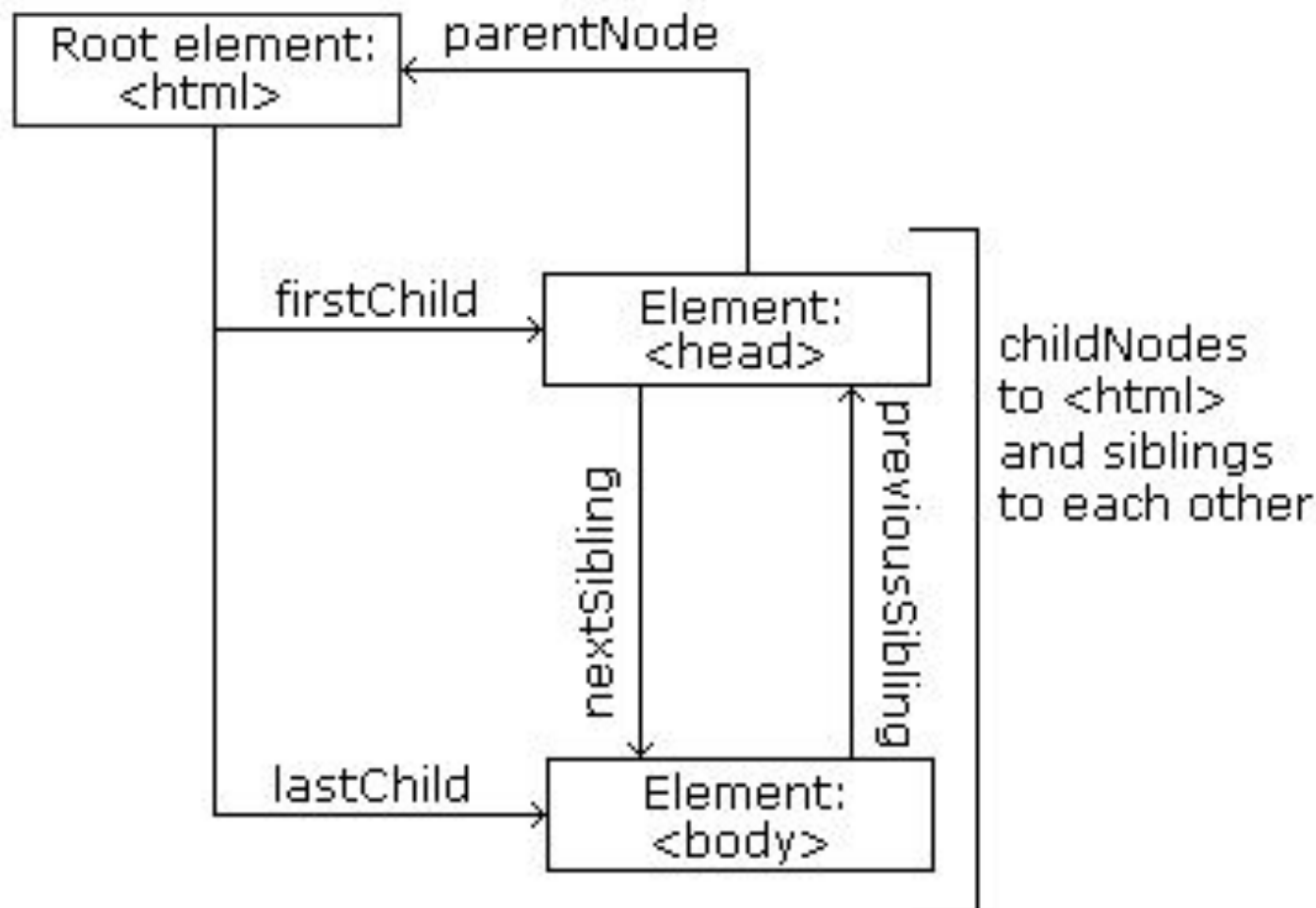
Addition and deletion

Method	Description
<code>document.createElement()</code>	Create an HTML element
<code>document.removeChild()</code>	Remove an HTML element
<code>document.appendChild()</code>	Add an HTML element
<code>document.replaceChild()</code>	Replace an HTML element
<code>document.write(<i>text</i>)</code>	Write into the HTML output stream

Adding event handlers

Method	Description
<code>document.getElementById(<i>id</i>).onclick=function(){<i>code</i>}</code>	Adding event handler code to an onclick event

Navigation



Creating elements

- `document.createElement(elementType);`
- `<div id="div1">`
`<p id="p1">This is a paragraph.</p>`
`<p id="p2">This is another paragraph.</p>`
`</div>`

`<script>`

```
var para = document.createElement("p");  
var node = document.createTextNode("This is new.");  
para.appendChild(node);
```

```
var element = document.getElementById("div1");  
element.appendChild(para);  
</script>
```


Deleting and replacing elements

- `parent.removeChild(child);`
- `parent.replaceChild(para,child);`
 - `<div id="div1">`
 `<p id="p1">This is a paragraph.</p>`
 `<p id="p2">This is another paragraph.</p>`
 `</div>`
 `<script>`
 `var para = document.createElement("p");`
 `var node = document.createTextNode("This is new.");`
 `para.appendChild(node);`
 `var parent = document.getElementById("div1");`
 `var child = document.getElementById("p1");`
 `parent.replaceChild(para,child);`
 `child = document.getElementById("p2");`
 `parent.removeChild(child);`
 `</script>`

Example 1

```
<html>
  <head>
    <script>
      // run this function when the document is loaded
      window.onload = function() {

        // create a couple of elements in an otherwise empty HTML page
        var heading = document.createElement("h1");
        var heading_text = document.createTextNode("Big Head!");
        heading.appendChild(heading_text);
        document.body.appendChild(heading);
      }
    </script>
  </head>
  <body>
  </body>
</html>
```

Big Head!

Example 2

```
<html>
  <head>
    <title>DOM Tests</title>
    <script type="application/javascript">
      function setBodyAttr(attr, value){
        if (document.body) eval('document.body.'+attr+'="'+value+'");
        else notSupported();
      }
    </script>
  </head>
  <body><div style="margin: .5in; height: 400px;"><form>
    <p><b><tt>text</tt>color</b></p>
    <select onChange="setBodyAttr('text', this.options[this.selectedIndex].value);">
      <option value="black">black
      <option value="darkblue">darkblue
    </select>
    <p><b><tt>bgColor</tt></b></p>
    <select onChange="setBodyAttr('bgColor', this.options[this.selectedIndex].value);">
      <option value="white">white
      <option value="lightgrey">gray
    </select>
    <p><b><tt>link</tt></b></p>
    <select onChange="setBodyAttr('link', this.options[this.selectedIndex].value);">
      <option value="blue">blue
      <option value="green">green
    </select>
    <small><a href="http://www.google.com" id="sample">(sample link)</a></small><br>
  </form>
</div>
</body>
</html>
```

textcolor

black ▼

bgColor

white ▼

link

blue ▼ (sample link)

Example 3

```
<html>
  <head>
    <title>DOM Tests</title>
  </head>
  <body>
    <table id="myTable">
      <tr>
        <td>Your age:</td>
        <td>
          <label><input type="radio" name="age" value="young" checked/> under 18 </label>
<label><input type="radio" name="age" value="mature"/> from 18 to 50</label>
          <label><input type="radio" name="age" value="senior"/> older than 60</label>
        </td>
      </tr>
    </table>
    <input type="button" value="Display" name="btn" onclick="display()"></input>
    <script>
      function display()
      {
        var elements = document.getElementsByTagName('input')
        for(var i=0; i<elements.length; i++) {
          var input = elements[i]
          alert(input.value+' : '+input.checked)
        }
      }
    </script>
  </body>
</html>
```

Your age: ☐ under 18 ☐ from 18 to 50 ☒ older than 60

Display

Example 4

```
<ol id="people">  
  <li>John</li>  
  <li>Rodger</li>  
  <li>Hugo</li>  
</ol>
```

```
<script>
```

```
var elem = document.getElementById('people')
```

```
var list = elem.getElementsByTagName('li')
```

```
alert(list[0].innerHTML)
```

```
</script>
```

Example 5

```
<div class="a b c">Yep</div>
```

```
<script>
```

```
alert( document.getElementsByClassName('a')[0].innerHTML )
```

```
</script>
```

Example 6

```
<ul>
```

```
  <li>The</li>
```

```
  <li>Test</li>
```

```
</ul>
```

```
<ul>
```

```
  <li>Is</li>
```

```
  <li>Passed</li>
```

```
</ul>
```

```
<script>
```

```
  var elements = document.querySelectorAll('UL > LI:last-child')
```

```
  for (var i = 0; i < elements.length; i++) {
```

```
    alert(elements[i].innerHTML)
```

```
  }
```

```
</script>
```

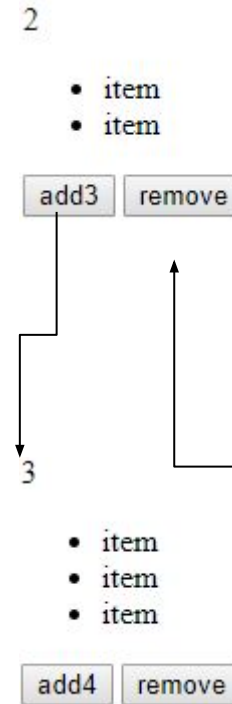
- The
- Test
- Is
- Passed

Example 7

```

<html>
  <title>DOM Tests</title>
</head>
<body>
  <label>2</label>
  <ul id="list">
    <li>item</li>
    <li>item</li></ul>
  <input type="button" id="add" value="add3" onclick="add()" />
  <input type="button" id="add" value="remove" onclick="remove()" />
  <script>
    var noli = 1;
    function add() {
      document.getElementById('list').insertAdjacentHTML('beforeend', '<li>item</li>');
      update(true);
      document.getElementById('add').value = 'add' + (noli + 1);
    }
    function remove() {
      console.log(document.getElementById('list').lastChild)
      document.getElementById('list').removeChild(document.getElementById('list').lastChild);
      update();
      document.getElementById('add').value = 'add' + (noli + 1);
    }
    function update(inc) {
      inc ? document.getElementsByTagName("label")[0].innerHTML = ++noli : document.getElementsByTagName("label")[0].innerHTML = --noli;
    }
    update(true);
  </script>
</body>
</html>

```



Example 8

```
<html>
```

```
<body>
```

```
  <p id="p2">Hello World!</p>
```

```
    <script>
```

```
      document.getElementById("p2").style.color = "blue";
```

```
    </script>
```

```
    <p>The paragraph above was changed by a script.</p>
```

```
</body>
```

```
</html>
```

Hello World!

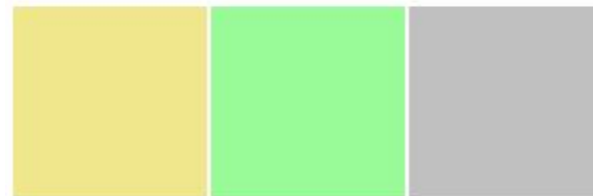
The paragraph above was changed by a script.

Example 9

```
<html>
<head>
  <script>
    function bgChange(bg) {
      document.body.style.background = bg;
    }
  </script>
</head>
<body>
  <h2>Change background color</h2><p>Mouse over the squares!</p>
  <table style="width:300px;height:100px">
    <tr>
      <td onmouseover="bgChange(this.style.backgroundColor)"
        onmouseout="bgChange('transparent')"
        style="background-color:Khaki">
      </td>
      <td onmouseover="bgChange(this.style.backgroundColor)"
        onmouseout="bgChange('transparent')"
        style="background-color:PaleGreen">
      </td>
      <td onmouseover="bgChange(this.style.backgroundColor)"
        onmouseout="bgChange('transparent')"
        style="background-color:Silver">
      </td>
    </tr>
  </table>
</body>
</html>
```

Change background color

Mouse over the squares!



Example 10

```
<script>
var bg=0;

function changeColor() {
    console.log(bg.toString(16));
    document.body.style.background = "#"+(bg+=100).toString(16);
}

setInterval(changeColor, 500);
</script>
```

Example 11

```
<html>
<head>
</head>
<body>
  <p id="myAnimation" style="position: absolute;">Animation!</p>
</body>
<script>

  elem = document.getElementById("myAnimation");
  pos = 0;
  id = setInterval(frame, 10);

  function frame() {
    if (pos > 350) {
      clearInterval(id);
    } else {
      pos++;
      elem.style.top = pos + 'px';
      elem.style.left = pos + 'px';
    }
  }

</script>
</html>
```