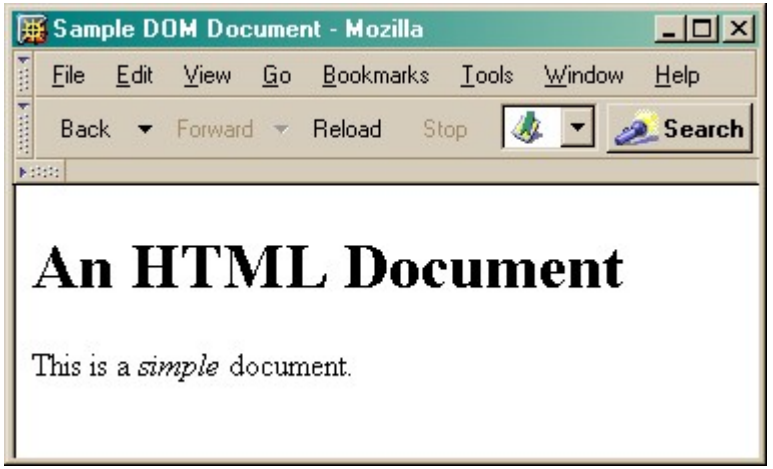
What is DOM?

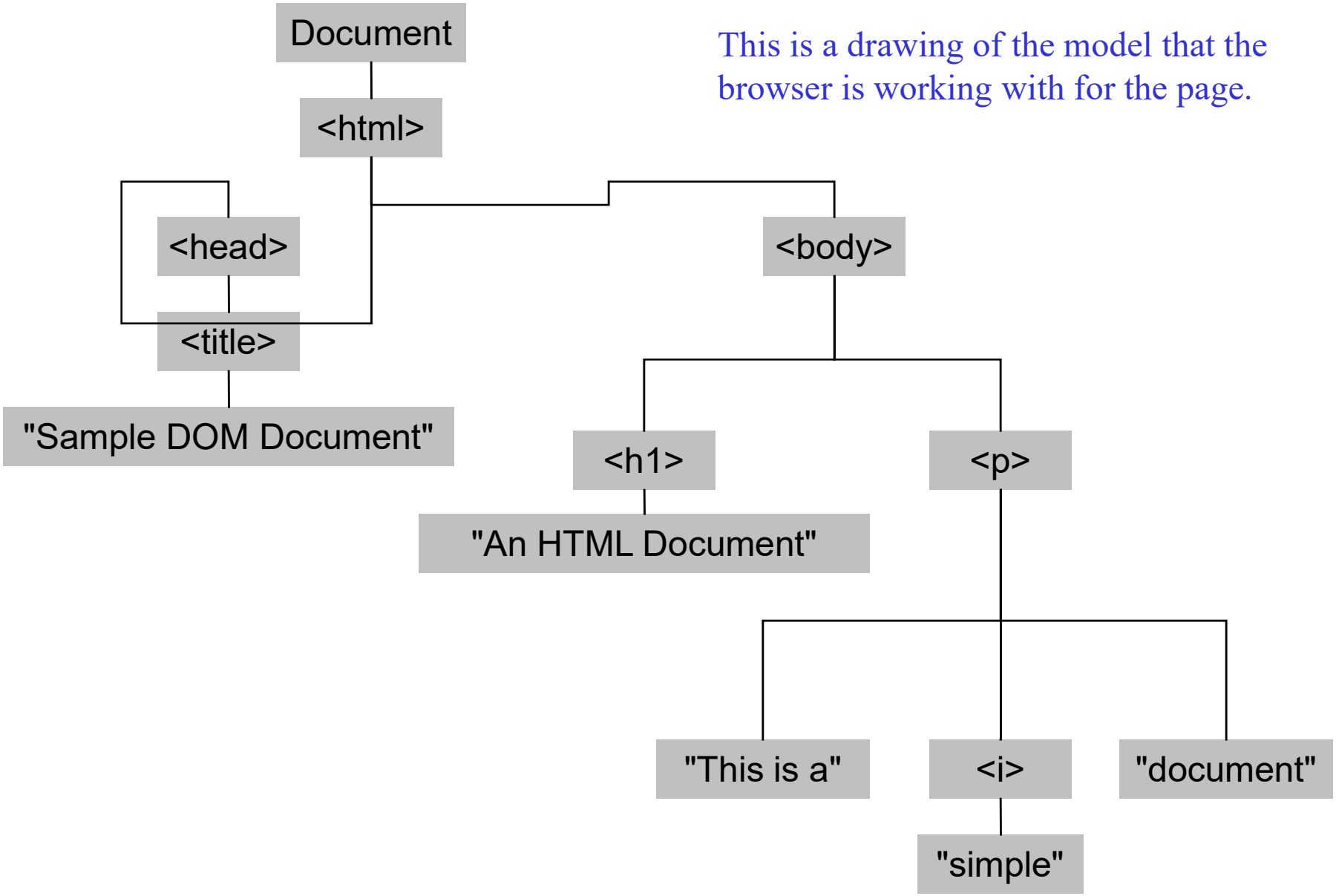
- Document Object Model
  - Your web browser builds a model of the web page (the document) that includes all the objects in the page (tags, text, etc)
  - All of the properties, methods, and events available to the web developer for manipulating and creating web pages are organized into objects
  - Those objects are accessible via scripting languages in modern web browsers

This is what the browser reads

```
<html>
  <head>
    <title>Sample DOM Document</title>
  </head>
  <body>
    <h1>An HTML Document</h1>
    <p>This is a <i>simple</i> document.
  </body>
</html>
```

This is what the browser displays on screen.





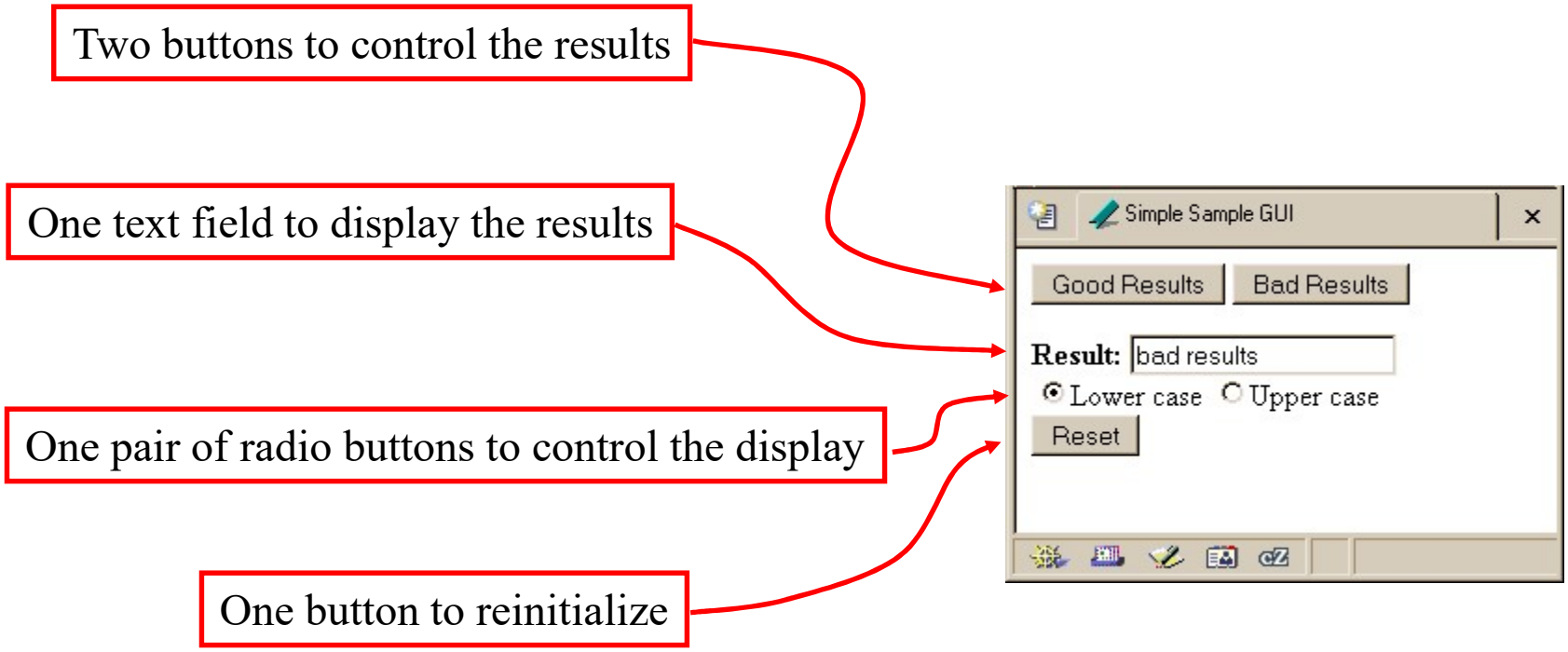
This is a drawing of the model that the browser is working with for the page.

Why is this useful?

- Because we can access the model too!
  - » the model is made available to scripts running in the browser, not just the browser itself
    - A script can find things out about the state of the page
    - A script can change things in response to events, including user requests
  - » We have already used this capability in the GUI programming that we've done

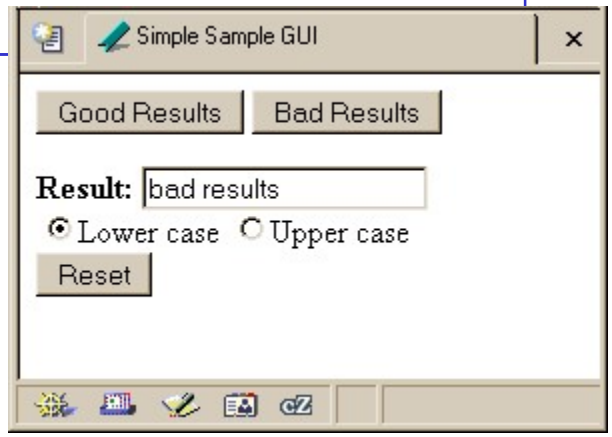
Recall our simple GUI example

This GUI has several simple controls.



setResults(resultString)

```
<script type="text/javascript">
function setResults(resultString) {
  var tempString = resultString;
  if (document.getElementById("radioLC").checked) {
    tempString = tempString.toLowerCase();
  } else if (document.getElementById("radioUC").checked) {
    tempString = tempString.toUpperCase();
  }
  document.getElementById("resultField").value = tempString;
}
</script>
```



the highlighted script above makes reference to several objects in the document object model

`document.getElementById("radioLC").checked`

- Reference to several nodes in the model of the page that the browser constructed
- **`document`**
  - » The root of the tree is an object of type `HTMLDocument`
  - » Using the global variable `document`, we can access all the nodes in the tree, as well as useful functions and other global information
    - title, referrer, domain, URL, body, images, links, forms, ...
    - open, write, close, getElementById, ...

Some information from a document

```
<html>
  <head>
    <title>DOM Sample 1</title>
  </head>
  <body>
    Information about this document.<br>
    <script type="text/javascript">
    document.write("<br>Title: ",document.title);
    document.write("<br>Referrer: ",document.referrer);
    document.write("<br>Domain: ",document.domain);
    document.write("<br>URL: ",document.URL);
    </script>
  </body>
</html>
```

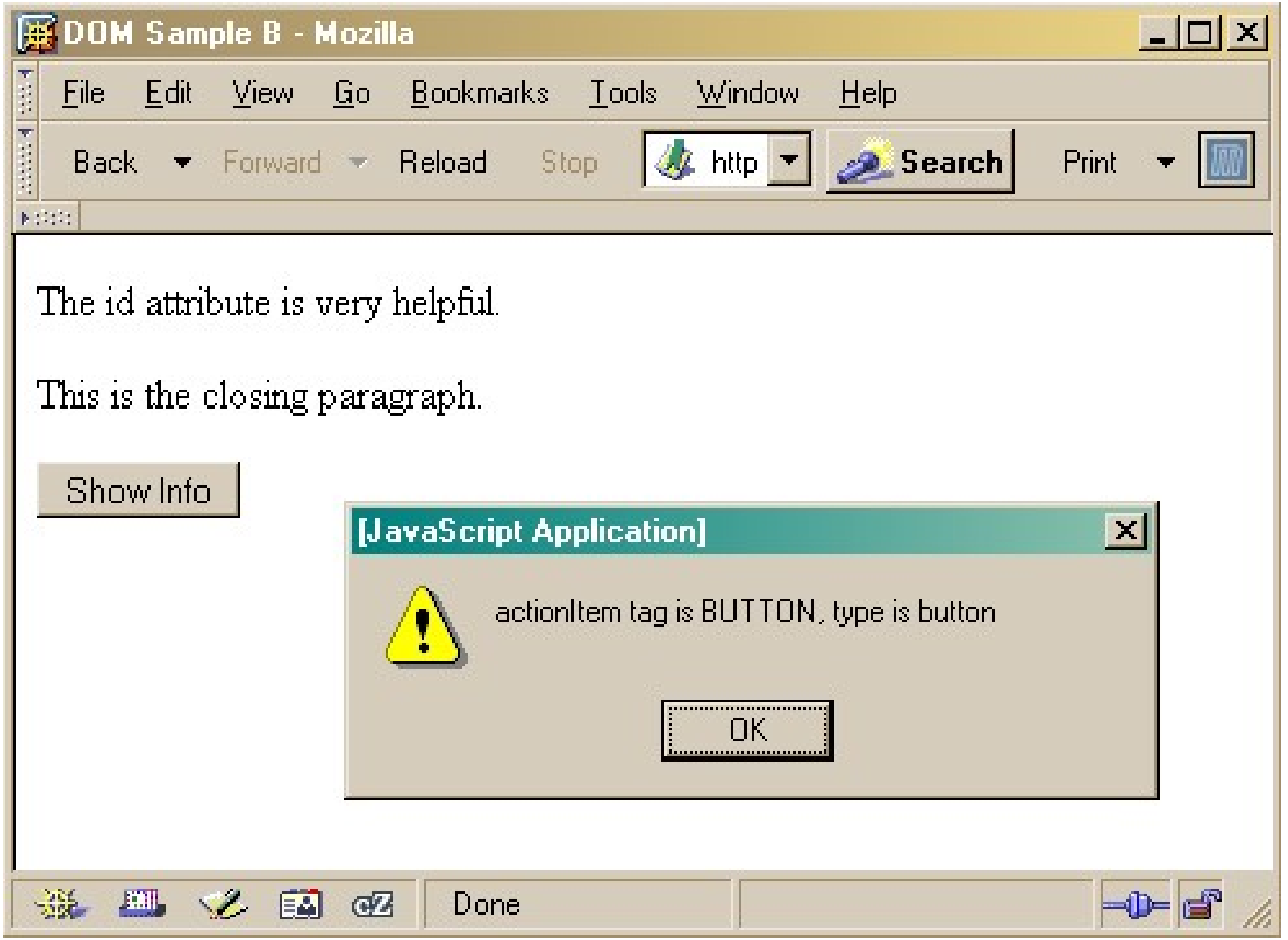
QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

```
document.getElementById("radioLC").checked
```

- **`getElementById("radioLC")`**
  - » This is a predefined function that makes use of the `id` that can be defined for any element in the page
  - » An `id` must be unique in the page, so only one element is ever returned by this function
  - » The argument to `getElementById` specifies which element is being requested

Some information about elements

```
<html>
  <head>
    <title>DOM Sample B</title>
    <script type="text/javascript">
    function showInfo() {
      var element = document.getElementById("opener");
      var buffer = element.id + " tag is " + element.tagName;
      alert(buffer);
      element = document.getElementById("actionItem");
      buffer = element.id + " tag is " + element.tagName;
      buffer += ", type is "+element.type;
      alert(buffer);
    }
    </script>
  </head>
  <body>
    <p id="opener">The id attribute is very helpful.</p>
    <p id="closer">This is the closing paragraph.</p>
    <form>
    <button id="actionItem" type="button" onclick="showInfo()">Show Info</button>
    </form>
  </body>
</html>
```

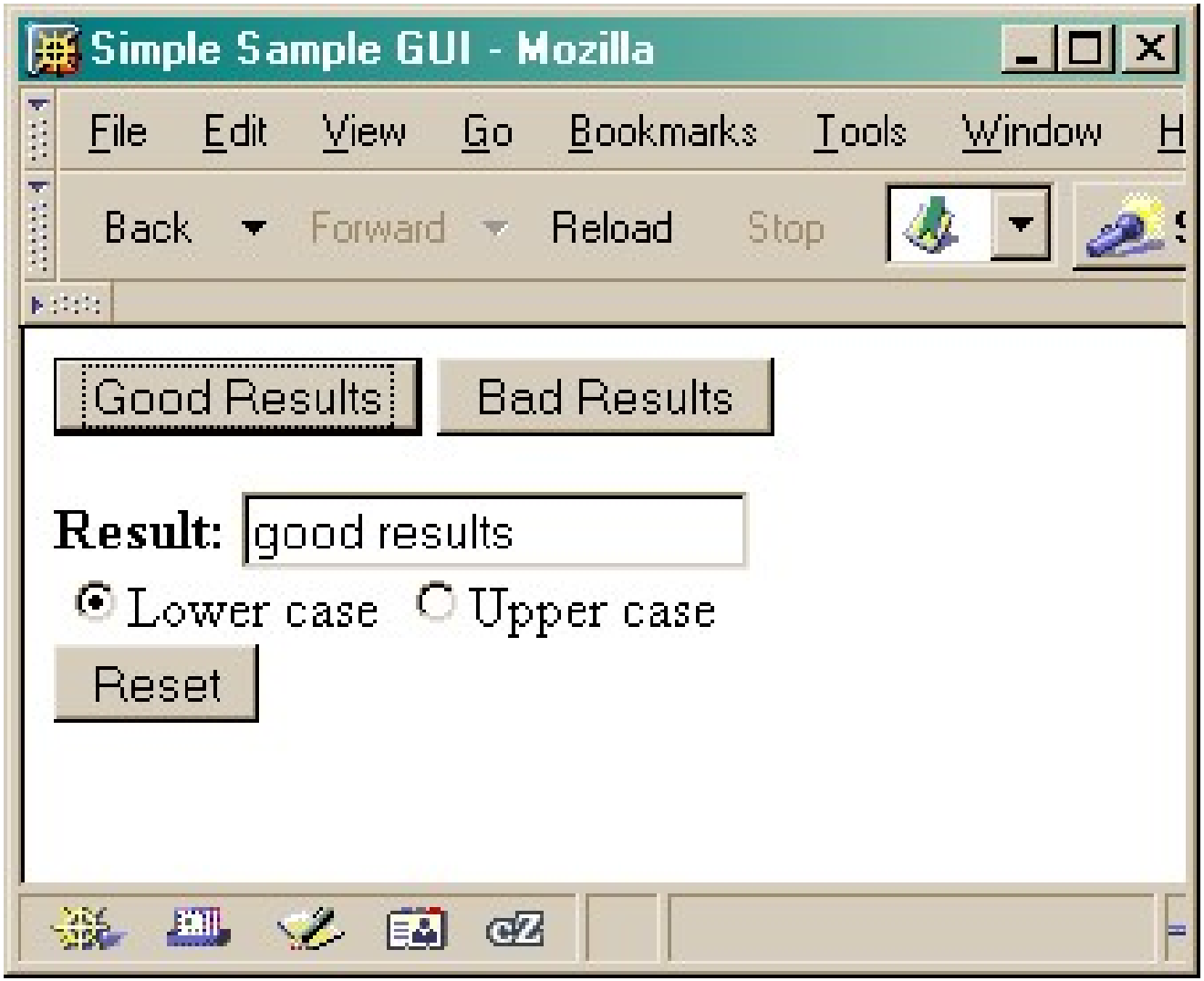

DOM Sample B - Mozilla
File Edit View Go Bookmarks Tools Window Help
Back Forward Reload Stop http Search Print
The id attribute is very helpful.
This is the closing paragraph.
Show Info
[JavaScript Application]
actionItem tag is BUTTON, type is button
OK
Done

```
document.getElementById("radioLC").checked
```

- **`checked`**
  - » This is a particular property of the node we are looking at, in this case, a radio button
  - » Each type of node has its own set of properties
    - for radio button: `checked, name, ...`
    - refer to the HTML DOM for specifics for each element type
  - » Some properties can be both read and set

Some specific properties

```
<head>
<title>Simple Sample GUI</title>
<script type="text/javascript">
function setResults(resultString) {
  var tempString = resultString;
  if (document.getElementById("radioLC").checked) {
    tempString = tempString.toLowerCase();
  } else if (document.getElementById("radioUC").checked) {
    tempString = tempString.toUpperCase();
  }
  document.getElementById("resultField").value = tempString;
}
</script>
</head>
```


Simple Sample GUI - Mozilla
File Edit View Go Bookmarks Tools Window H
Back Forward Reload Stop
Good Results
Bad Results
Result:
good results
Lower case
Upper case
Reset

Getting vs. Setting

```
var oldvalue = document.getElementById("resultField").value;

document.getElementById("resultField").value = "new value";
```

Just the tip of the DOM

- The HTML Document Object Model is a standard for structuring data on a web page
  - » The field is advancing rapidly as people recognize the benefits of standardized structure and access
  - » The DOM is steadily improving to cover general purpose data structuring requirements
- XML (Extendible Markup Language) also uses the Core DOM to specify its structured data
  - » similar to HTML but more carefully defined