Client Side Technologies

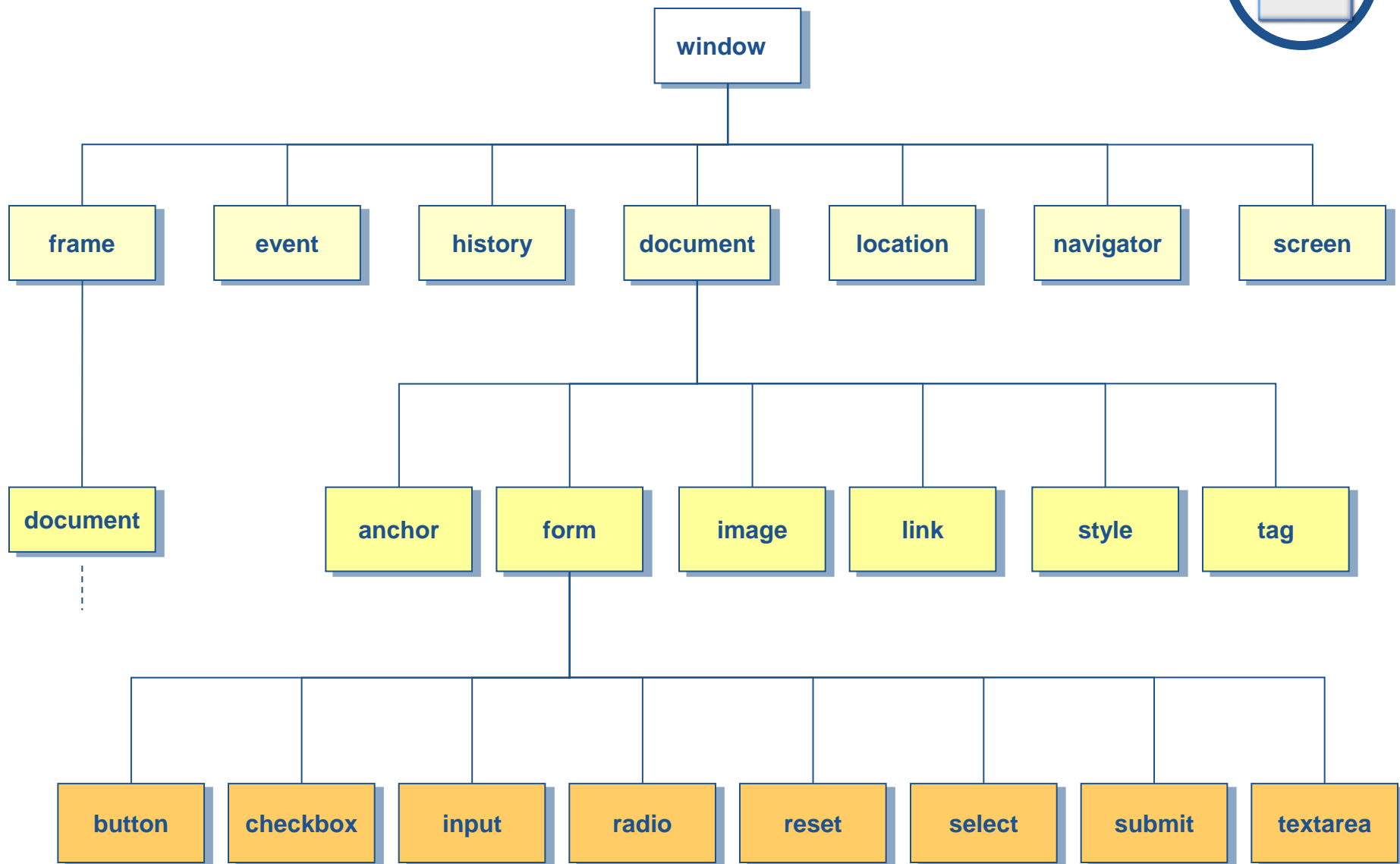# Document Object Model (DOM)

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What is DOM?

- ❑ **Stands for Document Object Model.**

- ❑ **W3C standard.**

- ❑ **Defines a standard way to access and manipulate HTML documents.**

- ❑ **Platform independent.**

- ❑ **Language independent**

DOM Model

```
                              window
                                 |
   ┌──────┬──────┬───────┬───────┴───────┬──────────┬──────────┐
 frame   event history  document      location  navigator  screen
   |                       |
document          ┌────┬───┴────┬──────┬──────┬──────┐
   ┆            anchor form   image   link  style   tag
   ┆                   |
              ┌────┬────┬────┬────┴────┬─────┬──────┬──────┐
           button checkbox input radio reset select submit textarea
```

DOM Model(Cont.)

Document

❑ **The document object represents the entire HTML document and can be used to access all elements in a page.**

❑ **A page is what appears within the browser window.**

❑ **So, every window is associated with a document object.**

❑ **Document Object has its own set of Properties, Collections, Methods & Event handlers.**

Document(Cont.)

❑ Properties:

Property	Description
bgColor	A string that specifies the background color.
fgColor	A string that specifies the text color.
linkColor	The color of text for a link that the user has not yet visited (read/write).
vlinkColor	The color of text for a link that the user has already visited (read/write).
alinkColor	The color of text for a link that the user clicks (read/write).
title	A string that specifies the contents of the TITLE tag.

Document(Cont.)

❑ **Methods:**

Method	Description
write()	Writes one or more HTML expressions to a document in the specified window.
writeln()	Writes one or more HTML expressions to a document in the specified window and follows them with a new line character.

Document(Cont.)

❑ **Methods:**

    o for accessing document elements.

Method	Description
getElementById("ID")	For accessing any element on the page via its ID attribute
getElementsByName("NAME")	Returns a collection of objects with the specified name
getElementsByTagName("TAGNAME")	Returns a collection of objects with the specified tag name
document.getElementsByClassName("ClassName")	Returns a collection of objects with the specified class name

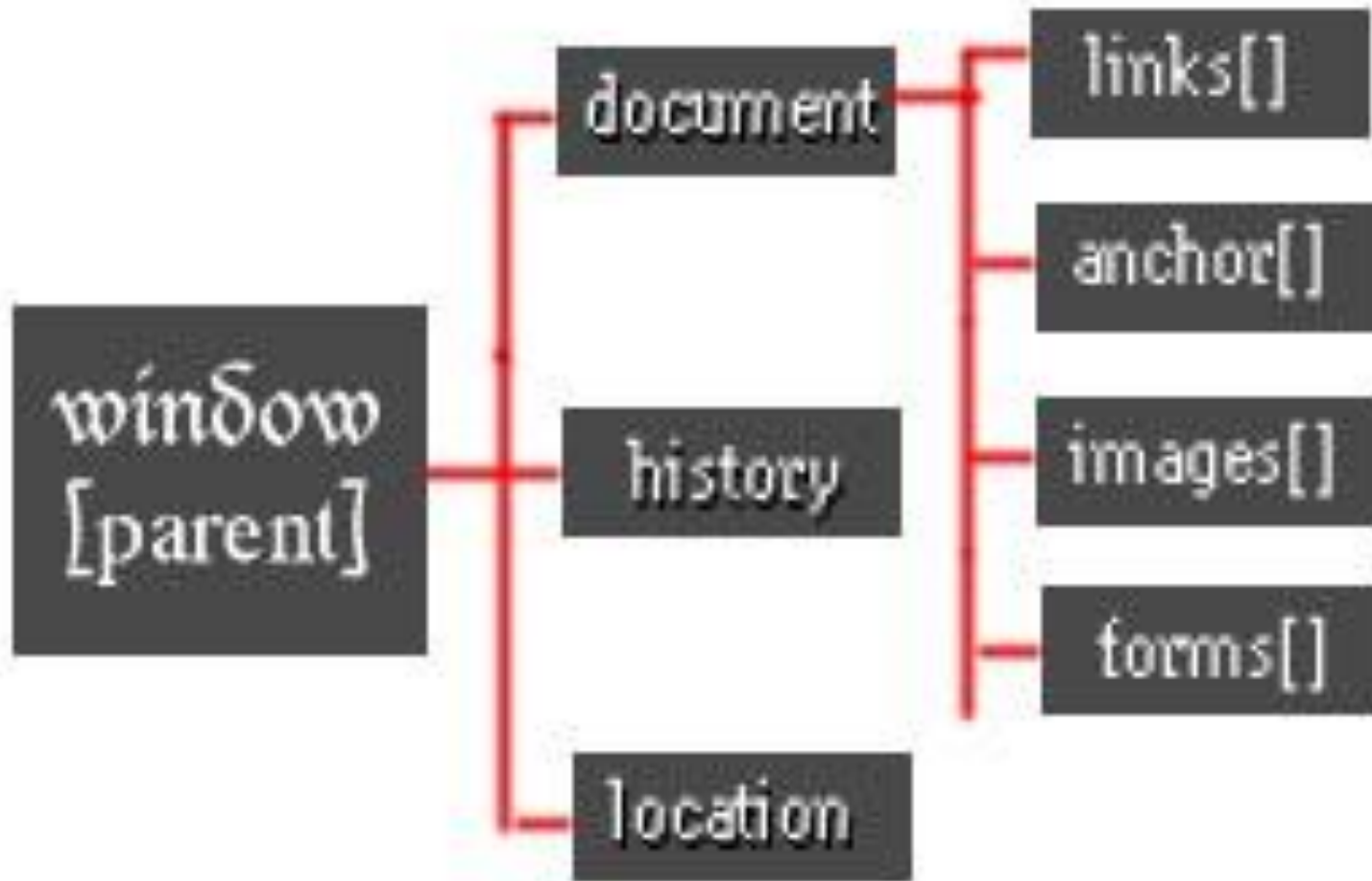# Document(Cont.)

❑ **Methods:**

    o for accessing document elements.

Method	Description
document.querySelector(css rule)	Returns the first element that matches a specified CSS selector(s) in the document.
document.querySelectorAll(css rule)	Returns a NodeList containing all elements that matches a specified CSS selector(s) in the document.

Document(Cont.)

Document(Cont.)

❑ **Collections :**

Collection	Description
forms	An array containing an entry for each form in the document
images	An array containing an entry for each image in the document
anchors	An array containing an entry for each anchor in the document.
links	An array containing an entry for each link in the document.

Document(Cont.)

☐ **Event Handler:**

onClick
onDblClick
onKeyDown
onKeyPress
onKeyUp
onMouseDown
onMouseUp

Image

❑ **The Image object is an image on an HTML form, created by using the HTML 'IMG' tag.**

❑ **Any images created in a document are then stored in an array in the document.images property.**

❑ **Image Object has its own set of Properties, Collections, Methods & Event handlers.**

Image(Cont.)

❑ **Object Model Reference:**

[window.]document.imageName
[window.]document.imageID
[window.]document.images[i]
[window.]document.images["ImgID"]
[window.]document.getElementById("ImageID")

**document.img1.src="img1.jpg"
document.images[0].src="img1.jpg"**

**document.img2.src="img2.jpg"
document.images[1].src="img2.jpg"**

```
<html>
    <body>
            .....
            <img name="img1" src="img1.jpg">
            <img name="img2" src="img2.jpg">
            …
        </body>
</html>
```

Image(Cont.)

❑ **Properties:**

name	id	src	height	width

❑ **Event handlers**

onmouseout	onmouseover	onmousemove	onclick	ondblclick

Form

❑ By using the form you have at your disposal information about the elements in a form and their values.

❑ A separate instance of the form object is created for each form in a document.

❑ Objects within a form can be referred to by a numeric index or be referred to by name.

❑ Object Model Reference:

[window.]document.formname
[window.]document.forms[i]
[window.]document.forms["formNAME"]
[window.]document.forms["formID"]

❑ HTML:

<FORM>
    [NAME="formName"]
    [TARGET="frameName or windowName"]
    [onSubmit="handlerText Or Function"]
    [onReset="handlerText Or Function"]>
</FORM>

Properties

Events

Form(Cont.)

❑ Properties:

Property	Description
elements[]	An array containing all of the elements of the form. Use it to loop through form easily.
length	The number of elements in the form.
name	The name of the form.
id	The id of the form.
target	The name of the target window form is to be submitted to.

Form(Cont.)

❑ Methods :

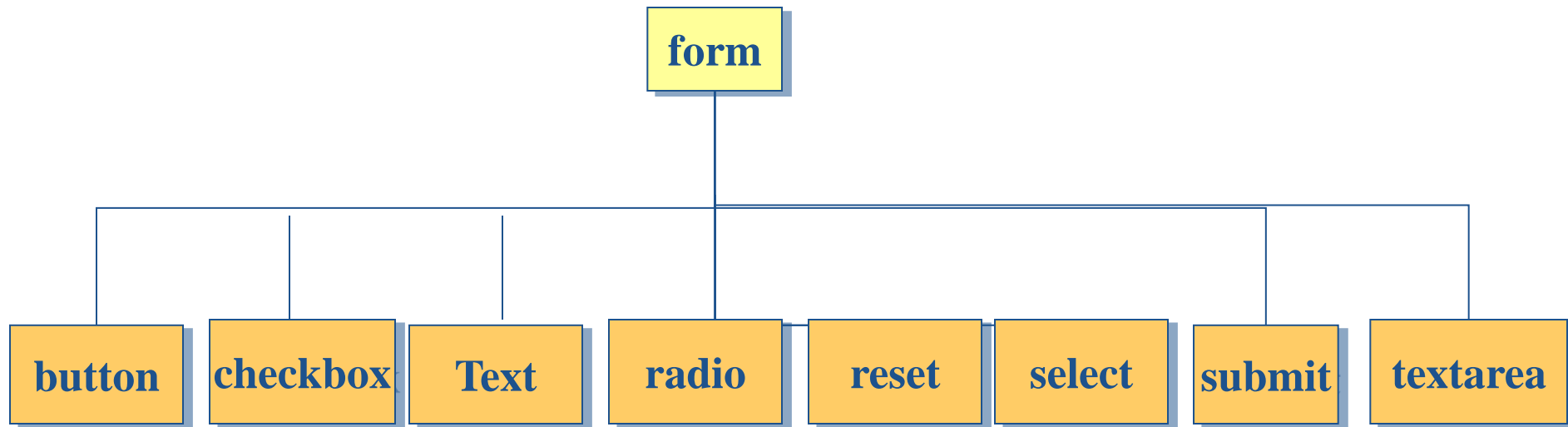| Method	Description
reset()	Resets the form. Clicking the reset button clears all contents that the user has made.
submit()	Submits a form. Clicking the submit button submits the content of the form to the server

Form(Cont.)

❑ Event handlers:

Event	Description
onReset	Code is executed when the form is reset (by clicking on "reset" button)
onSubmit	Code is executed when form is submitted

Form(Cont.)

```
                    ┌──────┐
                    │ form │
                    └──┬───┘
   ┌────────┬──────────┼──────────┬──────────┬──────────┬──────────┐
┌──────┐ ┌────────┐ ┌──────┐ ┌──────┐ ┌──────┐ ┌──────┐ ┌────────┐ ┌──────────┐
│button│ │checkbox│ │ Text │ │radio │ │reset │ │select│ │submit  │ │textarea  │
└──────┘ └────────┘ └──────┘ └──────┘ └──────┘ └──────┘ └────────┘ └──────────┘
```

Text

❑ HTML:

```
<input type="text"
        id="id"
         value="string"
        maxlength="n"
        size="x"
/>
```

Text (Cont.)

❑ Properties:

properties	Description
value	Sets or returns the value of the value attribute of a text field.
readOnly	Sets or returns whether or not a text field should be read-only.
disabled	Sets or returns whether or not a text field should be disabled

Text (Cont.)

❑ Methods

Method	Description
blur()	Removes focus from the field.
focus()	Assigns focus to the field; places the cursor in the control.
select()	Selects, or highlights, the content of the control.

Text (Cont.)

❑ Event Handlers:

Event Handler	Description
onfocus	The field gains focus when the user tabs into or clicks inside the control.
onblur	The field loses focus when the user tabs from or clicks outside the control.
Onchange	The field loses focus after the contents of the control have changed.

Drop down list

☐ HTML:

```
<select id="id" multiple size="n">
        <option value="string" selected >
                label
        </option>
        ...
</select
```

Drop down list(Cont.)

❑ Properties for Select:

Property	Description
length	The number of options in the list.
selectedIndex	The index number, beginning with 0, of the selected option.
options[]	An array of the options in the list. Used to reference properties associated with the options; e.g., options[1].value or options[2].text.
value	Sets or returns the value of the selected option in a drop-down list.
text	The text label associated with an option.
multiple	Sets or returns whether or not multiple items can be selected

❑ https://www.w3schools.com/jsref/dom_obj_select.asp

❑ https://www.w3schools.com/jsref/coll_select_options.asp

Drop down list(Cont.)

❑ Properties for Option:

Property	Description
selected	A true or false value indicating whether an option is chosen.
value	The value associated with an option.
text	The text label associated with an option.
index	Sets or returns the index position of an option in a drop-down list

Drop Down(Cont.)

❑ Methods

Method	Description
add()	Adds an option to a dropdown list
remove()	Removes an option from a dropdown list
focus()	Assigns focus to the field; places the cursor in the control.
blur()	Removes focus from a dropdown list

Drop down list(Cont.)

❑ Event Handlers:

Event Handler	Description
onfocus	The control gains focus.
onblur	The control loses focus.
onchange	A different option from the one currently displayed is chosen.

Radio button

❑ HTML:

```
<input type="radio"
        id="id"
        name="name"
        value="string"
        checked
/>
```

Radio button(Cont.)

❑ Properties

Properties	Description
length	The number of radio buttons with the same name.
checked	A true or false value indicating whether a button is checked.
value	Sets or returns the value of the value attribute of the radio button

Radio button(Cont.)

❑ Methods:

Method	Description
blur()	Removes focus from the field.
focus()	Assigns focus to the field; places the cursor in the control.
click()	Simulates a mouse-click on a radio button

Radio button(Cont.)

❑ Event Handlers:

Event Handler	Description
onfocus	The control gains focus.
onblur	The control loses focus.
onclick	The button is clicked.

Check Box

❑ HTML:

```
<input type="checkbox"
        id="id"
        name="name"
        value="string"
        checked
/>
```

❑ Properties:

Property	Description
checked	A true or false value indicating whether a button is checked.
value	Sets or returns the value of the value attribute of the check box

Check Box(Cont.)

❑ Methods:

Method	Description
blur()	Removes focus from the field.
focus()	Assigns focus to the field; places the cursor in the control.
click()	Simulates a mouse-click on a radio button

Check Box(Cont.)

❑ Event Handlers:

Event Handler	Description
onfocus	The control gains focus.
onblur	The control loses focus.
onclick	The button is clicked.

Button

❑ HTML:

```
<input type="button"
        id="id"
        value="string"
/>
```

Button(Cont.)

❑ Methods:

Method	Description
blur()	Removes focus from the field.
focus()	Assigns focus to the field; places the cursor in the control.
click()	Simulates a mouse-click on a button

Button (Cont.)

❑ Properties:

properties	Description
value	Sets or returns the text that is displayed on the button
disabled	Sets or returns whether or not a button should be disabled

Button(Cont.)

❑ Event Handlers:

Event Handler	Event
onclick	The mouse is clicked and released with the cursor positioned over the button.
ondblclick	The mouse is double-clicked with the cursor positioned over the button.
onmousedown	The mouse is pressed down with the cursor positioned over the button.
onmouseout	The mouse cursor is moved off the button.
onmouseover	The mouse cursor is moved on top of the button.
onmouseup	The mouse button is released with the cursor positioned over the button.

DOM HTML objects reference

- **DOM HTML objects reference**
  - http://www.w3schools.com/jsref/default.asp

Introducing SPAN & DIV

❑ Used to add text or HTML elements to the page without removing the page contents on the run time.

❑ HTML:

```
<span  id="s1">
          Hello There!
</ span>
```

```
<div id="d1">
          Hello There!
</div>
```

Introducing SPAN & DIV (Cont.)

❑ Properties (work with content elements):

properties	Description
innerText	Sets or returns the text that the control contains. "innerText is aware of the rendered appearance of text, while textContent is not." https://developer.mozilla.org/en-US/docs/Web/API/HTMLElement/innerText
textContent	Sets or returns the text that the control contains, and execute the HTML tags in the text. Differences from innerText: https://developer.mozilla.org/en-US/docs/Web/API/Node/textContent
innerHTML	Sets or returns the HTML text code that the control contains, and execute the HTML tags in the text.

Introducing SPAN & DIV (Cont.)

❑ Properties:

```
<script>
        document.getElementById("d1").innerText ="<b>new text</b>";
        ///<b>new text</b>
        document.getElementById("d1").textContent="<b>new text</b>";
        //<b>new text</b>
        document.getElementById("d1").innerHTML="<b>new text</b>";
        //new text
</script>
```

Variety of DOM References

❑ **Finding HTML Elements:**

- o Finding HTML elements by id
- o Finding HTML elements by tag name
- o Finding HTML elements by class name
- o Finding HTML elements by CSS selectors
- o Finding HTML elements by HTML object collections

This object

❑ Use this keyword to refer to the current object.

❑ Self reference to the object is used :

<input type="text" onFocus = "this.value='You are in!'"/>

This object (Cont.)

❑ Passing current Object as a function parameter:

```
function myFunction(myObject)
{
        myObject.value = "In the function!!"
}


        <input type="text" onClick="myFunction(this)"/>
```
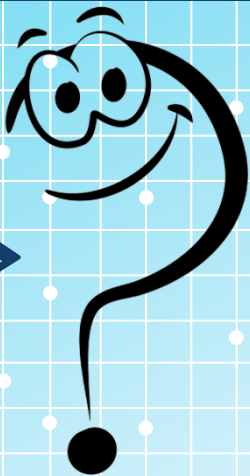
<SCRIPT > </SCRIPT>

<script>document.writeln("Thank You!")</script>