topicTwelve

JavaScript Essentials

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Learning Objectives

- At the end of this chapter the students should be able to:
  - Understand the difference between HTML and JavaScript
  - Understand how the browser recognize and handle JavaScript
  - Understand the basic syntax of JavaScript
  - Understand the different functions of JavaScript

Introduction

- JavaScript is a scripting language that was design to add programming functions into your standard HTML web pages.
- It can help you to collect information regarding web visitors, setting up page counter and much more.
- JavaScript is a client-side scripting.
- It can be written either internally or externally

Other functions of JavaScript are:

- **Browser Detection**
  - You can use JavaScript to detect the type of browser used by a visitor at your page. Some web pages work well under certain kind of browsers
- **Cookies**
  - Cookies are essential in any programming code because it can be used as an indicator for a certain record and to store information on the visitor's computer. The value of the cookies can be anything, from username to time, date, personal id and etc.
- **Control Browsers**
  - JavaScript can be used to open pages in customized windows, where you can specify if the browser's buttons, menu line, status line or whatever should be present.
- **Validate Forms**
  - Each form must be validate before it can be processed, in order to prevent visitors from entering empty or wrong character in the form. An example would be validating the entered email address to see if it has a @ in it, since if not, it's not a valid address.

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Using JavaScript

- JavaScript isn't a HTML file, so how does the browser recognize it?
- In order to process the JavaScript, you will need to let the browser know in advance when you enter JavaScript to an HTML page.
- This is done using the ***<script>*** tag.
- The browser will use the ***<script type="text/javascript">*** and ***</script>*** to tell where JavaScript starts and ends.

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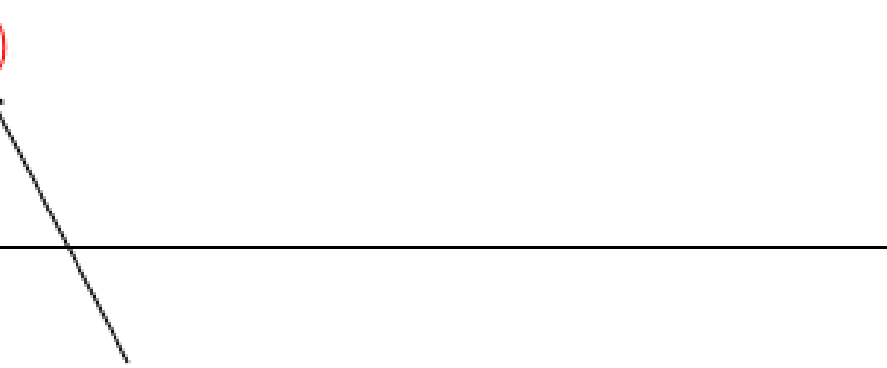
Basic Syntax

```
<script type="text/javascript">

statement/command;

</script>
```



Using JavaScript

- By entering the command/statement between the ***<script type="text/javascript">*** and ***</script>*** tags, it will help the browser to recognize it as a JavaScript command.
- If we had not entered the ***<script>*** tags, the browser would simply recognize it as pure text, and just write it on the screen.
- You are permitted to enter JavaScript in both the ***<head>*** and ***<body>*** sections of the document.
- However, it is advisable to keep as much as possible in the ***<head>*** section.
- Besides that, you could also use JavaScript in both (Head+body) and external JavaScript.

```
<html>

<head>

<title> Using JavaScript</title>

</head>

<body>

<script type="text/javascript">

document.write("This is a javascript statement");

</script>

</body>

</html>
```

JavaScript Rules

- **Must always end with semicolon.**
  - You may have noticed from the example on the previous page that JavaScript lines end with a semicolon. Failing to end it with semicolon will generate a script error and your JavaScript will not be functioning. You can write the code in a single line as long as it is separated by semicolon, but it's not advisable.
- **Always put the text within " ".**
  - When entering text to be handled by JavaScript, you should always put the text within " " bracket. Filing to do so will resulting JavaScript to interpret your text as being variables rather than text.
- **Case sensitive.**
  - JavaScript is case-sensitive programming language. You should always remember that capital letters are different from lowercase letters.

Variables

- A variable is simply a place in the computer's memory to store information.
- All variables are referred to by the unique name you assigned to them.
- Variables can be compared to a classroom full with students.
- Let's say that we have four (4) classrooms, each classroom comprises of 25 students. We can summarize that:

Variable	Class, a place where students are located
Variable Name	Name for each class. For example: A101, A102, A103 and A104
Content/ Value of variable	Number of students in each classes

Assigning value to variable

- The most common way to assign a value to a variable is using the equals sign.
- Variable is a case sensitive.
- For example, **myVar** is different with **MyVar**.
- Even though the mistake is minimal, the JavaScript will consider that it's a different kind of variables

Some of the way to assigning values is:

Value Assignment	Result (as printed in web pages)
MyVar= 100;	100
MyVar=100; MyVar++;	101
MyVar=100; MyVar--;	99
MyVar=5; a=MyVar-5;	0
MyVar=5; a=MyVar+5;	10
Name1= “Malik”;	Malik
Name2= “Aziz”;	Aziz
Name3=Name1+“ “+Name2;	Malik Aziz
a=4*3;	12
d=12/4;	3
e=(1+3)*4;	16

Basic Operator	
Addition	+
Subtraction	-
Multiplication	*
Division	/
++	Increment
- -	Decrement

Example 1	Example 2
<html><head> <title> Using JavaScript</title></head> <body> *<script type="text/javascript">* *myVar=3;* *MyVar=5;* *result=myVar+MyVar;* *document.write(result);* *</script* </body></html>	<html><head> <title> Using JavaScript</title></head> <body> *<script type="text/javascript">* *myVar=3;* *MyVar=5;* *result=MyVar+MyVar;* *document.write(result);* *</script* </body></html>

Choosing Right Syntax

- The best advice is to use the same syntax on all variables.
- Either write all variables in small letters, start with one capital letter or write all variables in capitals.
- Which syntax you chose is not important - as long as you chose just one.
- For example, you could capitalize each of the variables or using a particular jargon to representing each element, such as *int for Integer, txt for text and etc.*

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Concatenation

- The + operator can be used to add string variables or text values together. For example:

```
varFname= “Rahimi”;
varLName= “Rosman”;
varFullName= varFname + varLName;
```

Comparison Operator

- Comparison operator is used in logical statement to determine equality or difference between variables or values.

Operator	Description	Example
==	is equal to	x==8 is false
===	is exactly equal to (value and type)	x===5 is true x==="5" is false
!=	is not equal	x!=8 is true
>	is greater than	x>8 is false
<	is less than	x<8 is true
>=	is greater than or equal to	x>=8 is false
<=	is less than or equal to	x<=8 is true

For example:

```
Var age=18;

If (age<21) document.write("Your age is under 21 years old");
```


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Logical Operator

- Logical operator is used to determine the logic between values and variables.

Operator	Description
&&	and
||	or
!	not

For example, let say x=3 and y=6:

1. (x<3 || y>3) will produced true
2. (x<3 || y<3) will produced false
3. (x<1 && y>3) will produced true
4. (x!=2) will produced true

EXERCISE

If x equal to 6 and y equal to 10, provide the answer for the following statement:

a. x++
b. x+=y
c. y--
d. y%x
e. ((x--)+y)/ 5
f. (x*2)/12

Conditional statement

- Conditional statement is used to perform a different action for a different decision. There are three types of conditional statement:
  - If statement – execute some code if condition is true
  - If..else statement - execute some code if condition is true and another if condition is false
  - If…else if…else statement – used this statement to select one of many code to be executed
  - Switch statement - used this statement to select one of many code to be executed

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If Statement

```
Var Result=78;

If (Result<80) document.write("Harap  Maaf, anda tidak Berjaya");
```

If…else Statement

```
Var Result=78;

If (Result<80)

{document.write("Harap Maaf, anda tidak Berjaya");}

else

{document.write("Anda mendapat  A untuk subjek ini");}
```

If…else if…else Statement

```
var Result=78;

if (Result<80)

{document.write("Tahniah.  Anda Lulus");}

else if (Result<50)

{document.write("Harap maaf, anda gagal");}

else

{document.write("Anda mendapat A untuk subjek ini");}
```

Switch Statement

```
    var Result=78;

switch(Result)
{
case 78;
document.write("Anda Lulus");
break;
case 80;
document.write("Tahniah, anda mendapat gred A");
break;
case 49;
document.write("Harap Maaf, anda gagal");
break;
}
```


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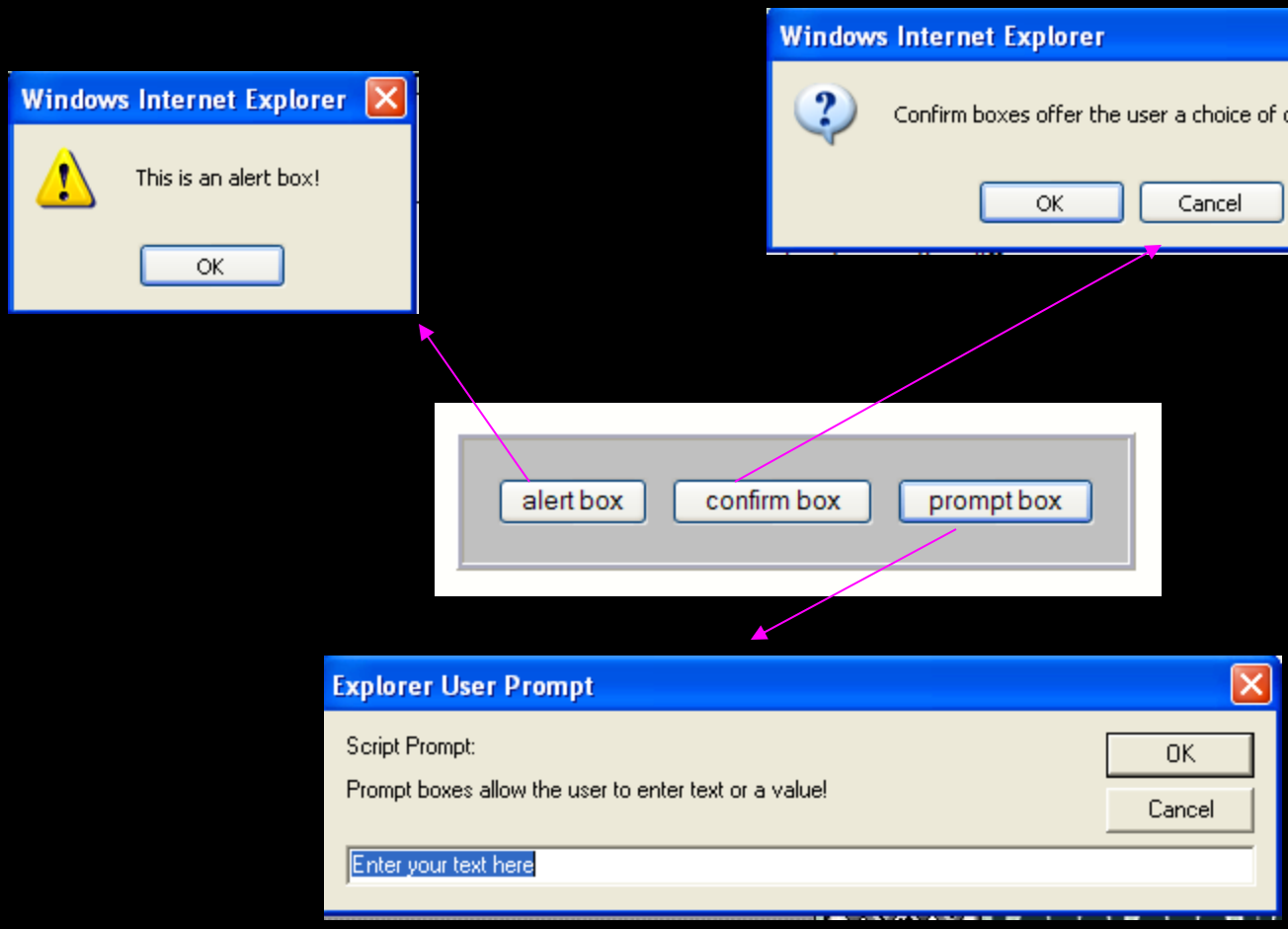
JavaScript: Pop Up Boxes



JavaScript: Alert Box

- The syntax for an alert box is: **alert("yourtext");**
- The user will need to click "OK" to proceed.
- Typical use is when you want to make sure information comes through to the user.
- Examples could be warnings of any kind. (Typical examples are "Adult Content", or technical matters like "This site requires Shockwave Flash plug-in").

JavaScript: Confirm Box

- The syntax for a confirm box is: **confirm("yourtext");**
- The user needs to click either "OK" or "Cancel" to proceed.
- Typical use is when you want the user to verify or accept something.
- Examples could be age verification like "Confirm that you are at least 57 years old" or technical matters like "Do you have a plug-in for Shockwave Flash?“
  - If the user clicks "OK", the box returns the value **true**.
  - If the user clicks "Cancel", the box returns the value **false**

```
if (confirm("Do you agree")) {alert("You agree")}
else{alert ("You do not agree")};
```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JavaScript: Prompt Box

- The prompt box syntax is: **prompt("yourtext","defaultvalue");**
- The user must click either "OK" or "Cancel" to proceed after entering the text.
- Typical use is when the user should input a value before entering the page.
- Examples could be entering user's name to be stored in a cookie or entering a password or code of some kind.
  - If the user clicks "OK" the prompt box returns the entry.
  - If the user clicks "Cancel" the prompt box returns **null**.
- Since you usually want to use the input from the prompt box for some purpose it is normal to store the input in a variable:

```
username=prompt("Please enter your name","Enter your name here");
```


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JavaScript: Example 1 (alert)

```
<html>
<head><title>Alert Box</title>
<script type="text/javascript">
alert("Selamat datang ke website saya");
</script>
</head>
<body>
</body>
</html>
```


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JavaScript: Example 2 (prompt)

```
<html>
<head><title>Prompt Box</title>
<script type="text/javascript">
pengguna=prompt("Masukan Nama Anda","Nama Anda");
</script></head>
<body>
Selamat datang ke website ini,
<script type="text/javascript">
document.write (pengguna);
</script><br>
Umur anda: <br>
Tarikh Lahir:<br>
email:<br>
</body>
</html>
```


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JavaScript: Example 3(Confirm)

```
<html>
<head><title>Confirm Box</title></head>
<body>

<script type="text/javascript">
pengguna=confirm("Adakah anda Mahasiswa/i IS110?");

if (pengguna==true)
{
document.write ("Selamat datang ke Website <a href='http://is110.official.ws'>Image</a>");
}
else
{
document.write ("Maaf, website ini hanya untuk student IS110 sahaja");
}

</script>
</body>
</html>
```


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A Taste Of Javascript

- Many of the most popular effects created on Web pages these days have little or nothing to do with HTML and everything to do with *JavaScript*, a scripting language originally developed by Netscape Communications and now supported by all major browsers.
- This topic will discuss a sampler of very simple scripts.
- Hopefully, they will give you the beginning of an idea of what you can do with JavaScript

Adding the Current Date and Time

- Nothing makes your page seem more current than adding the date and the time.
- While they're a bit more complicated to format in a particular way, just adding them is not difficult at all.
- To add the current date and time to your page:

```
<html>

<head>

<title>Current Date</title>

</head>

<body>

<script type="text/javascript">

document.write("Current  Date is <b>"+ Date() + "</b>");

</script>

</body>

</html>
```

Setting a New Window's Size

- Previously you have learned how to open a link in a new window.
- JavaScript lets you control how big that window should be.

To set the size of a new window:

1. Type **<a href="javascript:location='current.html';**, where *current.html* is the URL of the page that contains the link.
2. Type **window.open('nextpage.html'**, where *nextpage.html* is the URL of the page to be opened in the new window.
3. Type **'label'**, where *label* is the name of the new window.
4. Type **'height=h,width=w**, where *h* and *w* are the desired height and width for the new window. (No spaces!)
5. If desired, type **,chrome=yes**, where *chrome* is scrollbars, toolbar, status, menubar, location, or resizable.
6. If desired, type a, (comma) and repeat step 5 as desired. Each window part should be separated from the previous one with a comma but no spaces.
7. Type ' (a straight apostrophe)whether or not you've set the window parts.
8. Type **)"** to finish the JavaScript code.
9. Type **>clickable text**.

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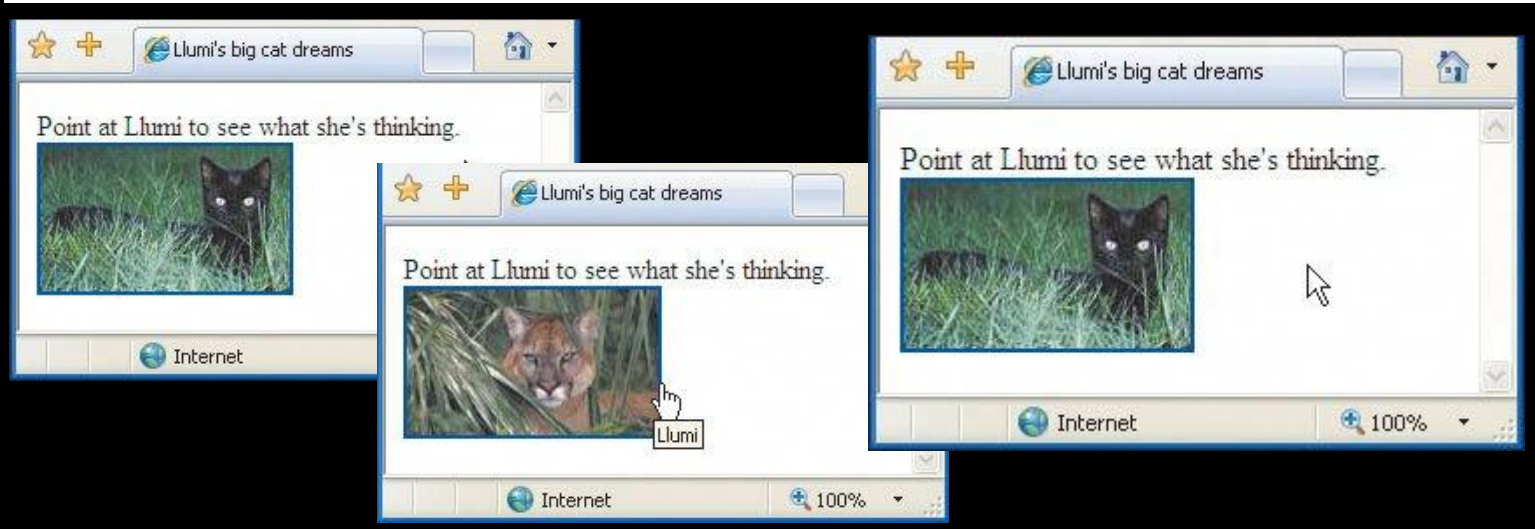
```
<html>

<head>

<title>New Windows</title>

</head>

<body>

<a
href="javascript:location='test.html';window.open('test2.html','character','height
=150,width=150,scrollbars=yes')">Open  in New Windows</a>

</body>

</html>
```

Changing an Image When a Visitor Points

- You can make an image change when the visitor points at it.
- This is commonly called a "rollover". To change an image when the visitor points at it:

```
<html>

<head>

<title>Rollover Images</title>

</head>

<body>

<a href="test.html" onmouseover="document.pic.src='a.gif'"
onmouseout="document.pic.src='b.jpg'"><img src='a.gif' name='pic'></a>

</body>

</html>
```



Changing a Link's Status Label

```
<html><head>
<title>Link Status</title>
</head>
<body>
<img src="a.gif" alt="Big Bang Theory" align="left"
    width="384" height="256" border="0"
    hspace="5" vspace="0"
    onmouseover="window.status='Sun to earth';
    return true"
    onmouseout="window.status='Testing'; return
    true" />
</body>
</html>
```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Changing Multiple Frames with One Link

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
   "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="content-type" content="text/html; charset=iso-8859-
     1" />
<meta http-equiv="Content-Script-Type" content="text/javascript" />
<title>Table of Contents</title>
</head>
<body>
<h1>Wild Animals</h1>

<br />
<a
href="javascript:location='toc.html';parent.topright.location='birdbuttons.
     html';parent.bottomright.location='parrots.html'">
Birds</a> <br />
</body></html>
```

Loading Images into Cache

- You can use JavaScript to load all of the images into your browser's cache as the page is initially displayed on the screen.
- One benefit is that rollovers are instantaneous

To load images into cache:

1. In a separate text document, on the first line, type **label=**, where *label* is a word that identifies the image.
2. Type **new Image(h,w)**, where *h* and *w* are the image's height and width, in pixels.
3. On the next line, type **label**, where *label* matches the label used in step 1.
4. Directly following the name in step 3 (i.e., with no extra spaces), type **.src="image.url"**, where *image.url* is the location of the image on the server.
5. Repeat steps 1-4 for each image you wish to load into cache
6. Save the script in text-only format and call it *loadimages.js*.
7. In the head section of the (X)HTML document that uses the images, type **<script type="text/javascript" language="javascript" src="loadimages.js"> </script>**, where *loadimages.js* is the name of the file you saved in step 6.
8. When you refer to the images in other scripts, use **label.src** (without quotes), where *label* is the word you used to describe the images in step 1

```
littlecat = new Image(143,83)
littlecat.src = "real.jpg"
bigcat = new Image(143,83)
bigcat.src = "dream.jpg"
```

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML
1.0 Transitional//EN"
   "http://www.w3.org/TR/xhtml1/DTD/xhtml1-
transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="content-type"
content="text/html; charset=iso-8859-1" />
<meta http-equiv="Content-Script-Type"
content="text/javascript" />
<title>Llumi's big cat dreams</title>
<script type="text/javascript" language=
"javascript" src="loadimages.js"></script>
</head>
<body>
Point at Llumi to see what she's thinking. <a
href="llumipage.html"
onmouseover="document.catpic.src=bigcat.src"
onmouseout="document.catpic.src=littlecat.src"><i
mg src="real.jpg"
name="catpic" width="143" height="83"
alt="Llumi"/></a>
</body>
</html>
```

Exercise

- Create a simple JavaScript statement that request a number from visitors. The script should check whether the number is an odd or even number. The result will be display in an alert box.

Exercise

GRED	MARKS
A+	90-100
A	80-89
A-	75-79
B+	60-64
B	65-69
B-	60-64
C+	55-59
C	50-54
C-	47-49
D	44-46

- Convert the following table into a JavaScript statement by using if functions.
- The student marks will be inputted using the prompt box and the result will be displayed in the body of the documents.
- Alert box will appear if the input greater than 100

Exercise

- Create a script that request ***initial loan***, ***interest***, ***payback period***, and display the data in the document alongside expected ***monthly payment***.

Exercise

- Create a JavaScript statement that request 2 input from user (page title and background color/picture) and display it on the screen.