EECS 1012: Introduction to Computer Science

October 3, 2016

Notes

- This week's lab is a 'search and rescue lab'

  - It has a pre-lab quiz

- Next week is a practice lab test

  - No pre-lab quiz

  - Your lab on Monday? You will have to do it on your own.

Objects in JavaScript

- Objects are (among other things) containers that can hold other things, properties and methods

- Given an object instance o, you

  - reference one of its properties p as o.p

  - reference one of its methods m() as o.m()

Some examples

- var x = document.getElementById("foo")

  - is an invocation of the getElementById() method on the object instance document

- x.innerHTML = "hello"

  - sets the property innerHTML of the object instance x to the value "hello"

Examples for strings

- var s = "hello";

  - s.length - the length of the string

  - s.charAt(n) - the character at position n

  - s.indexOf("el") - the position of "el" in s

DOM

- Document object model

- The entire document is an object

  - You can manipulate the entire document (even creating parts on the fly) using its methods and properties

  - We will return to this in a later class

An example

- Goal here is to understand the code (not necessarily to be able to write this from scratch)

Canvas

```
<DOCTYPE! html>
<html>
<head>
<script type="text/javascript" src="canvas.js"></script>
</head>
<body>
<canvas width="640" height="480" id="mycanvas"> </canvas>
</body>
</html>
```

Canvas

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<head>
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```

The HTML <canvas> element is used to draw graphics on a web page.

The graphic to the left is created with <canvas>. It shows four elements: a red rectangle, a gradient rectangle, a multicolor rectangle, and a multicolor text.

Smile!

```
function drawCanvas() {
    alert("drawCanvas called");
    var id = document.getElementById("mycanvas");
    var cx = id.getContext("2d");
    cx.beginPath();
    cx.moveTo(0,0);
    cx.lineTo(639,479);
    cx.closePath();
    cx.stroke();
}

window.onload = drawCanvas;
```

Syntax

```
1  window.onload = funcRef;
```

• funcRef is the handler function to be called when the window's load event fires.

```
function drawCanvas() {
    alert("drawCanvas called");
    var id = document.getElementById("mycanvas");
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    cx.beginPath();
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window.onload = drawCanvas;
```

invoke the method getElementById() on the document object

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    alert("drawCanvas called");
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}

window.onload = drawCanvas;
```

invoke the getContext method on the canvas element
This is a drawing context

Slide 1

```
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    var id = document.getElementById("mycanvas");
    var cx = id.getContext("2d");
    cx.beginPath();
    cx.moveTo(0,0);
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    cx.stroke();
}

window.onload = drawCanvas;
```

Large number of drawing context methods that 'draw' on the canvas

Slide 2

Lets do another example

```
West of House                                              Score: 0  Turns: 0
Copyright (c) 1981, 1982, 1983 Infocom, Inc. All rights reserved.
ZORK is a registered trademark of Infocom, Inc.
Revision 88 / Serial number 840726

West of House
You are standing in an open field west of a white house, with a boarded front
door.
There is a small mailbox here.

>n
North of House
You are facing the north side of a white house. There is no door here, and all
the windows are boarded up. To the north a narrow path winds through the
trees.

>s
The windows are all boarded.

>e
Behind House
You are behind the white house. A path leads into the forest to the east. In
one corner of the house there is a small window which is slightly ajar.

>
```
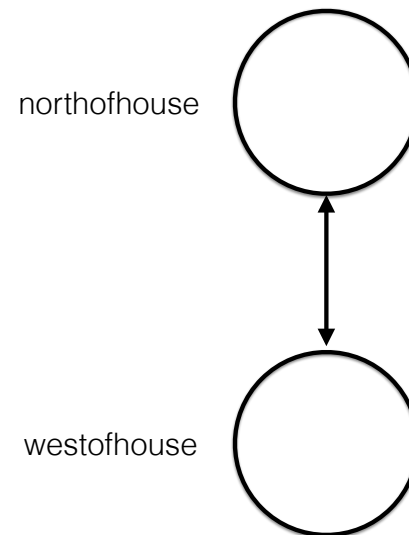
Slide 3

Some simplifications

- You are in a place

- Can go N, S, E, W (others left as an exercise for the student)

- Cannot manipulate things

Slide 4

northofhouse

westofhouse

```html
1    <!DOCTYPEhtml>
2    <html>
3    <head>
4    <script src="adventure.js" type="text/javascript"> </script>
5    </head>
6    <body>
7       <div id="description">Description</div>
8       <button onclick="north()">North</button>
9       <button onclick="south()">South</button>
10      <div id="debug"> Debugging Statements<br> </div>
11   </body>
12   </html>
13
```

```javascript
var westofhouse = {desc : "West of White House. This is an open field west of a white house"};
var northofhouse = {desc : "North of House. You are facing the north side of a white house."}
var current;
function initialize() {
  debug("initialized");
  westofhouse.north = northofhouse;
  northofhouse.south = westofhouse;
  current = westofhouse;
  description("");
}

function north() {
  if(current.north == undefined) {
    description("You cannot go that way.<br>")
  } else {
    current = current.north;
    description("");
  }
}
```