Ajax · HTML5 · Cookies

Sessions 1A and 1B

JavaScript

- Popular scripting language:
  - Dynamic and **loosely typed** variables.
  - **Functions** are now first-class citizens.
  - Supports **OOP**.

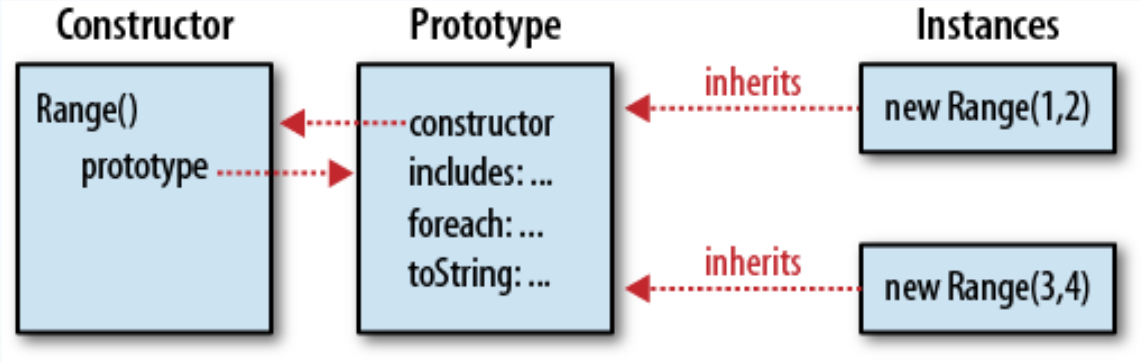
```
var simple = 2;                                  // Simple variables.
simple = "I'm text now!";                        // Changing type.

var array = new Array( 1, 2, "hey" );            // Associative array
array[3] = new Array( "a", "b" );                // with more complex content.

var obj = { "some-text": "This is a point" };    // An object
obj.x = -1.2;                                    // and its members.
obj.y = +3.4;
```

- What does the following function do?

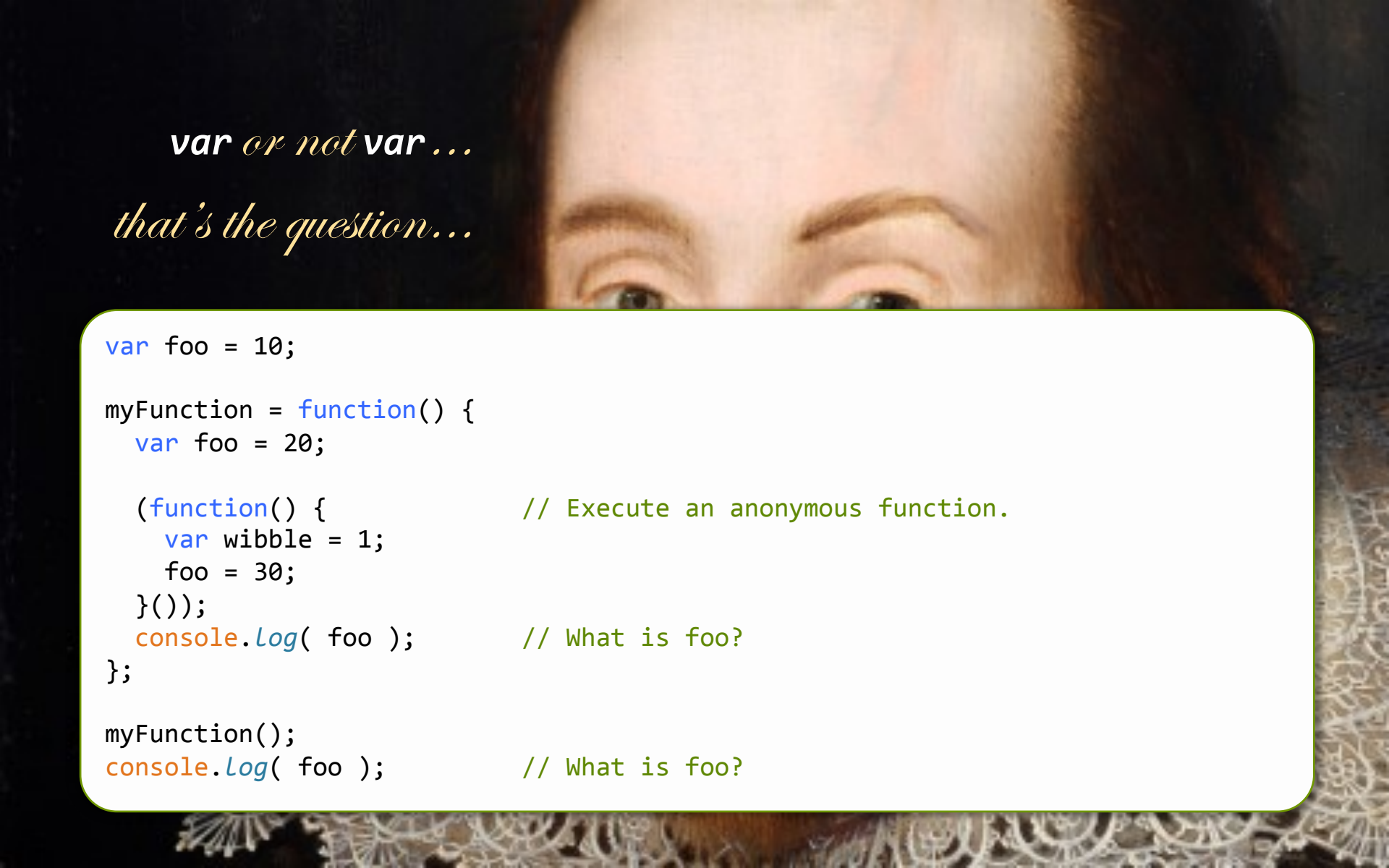
```
function whatDoIDo( x )
{
        // If the input argument is invalid, throw an exception!
        if (x < 0) throw new Error( "x must not be negative” );

        // Otherwise, compute a value and return normally.
        for( var f = 1; x > 1; f *= x, x-- ) /* empty */ ;
        return f;
}
```

- What about OOP in JavaScript?

```
// Store the start and end points (state) of this new range object.
function Range( from, to ) {
  this.from = from;
  this.to = to;
}

// All Range objects inherit from this object.
// Note that the property name must be "prototype" for this to work.
Range.prototype = {
    constructor: Range,     // Explicitly set the constructor back-reference.

    // Return true if x is in the range, false otherwise.
    includes: function( x ) {
        return this.from <= x && x <= this.to;
    },

    // Return a string representation of the range
    toString: function() {
        return "(" + this.from + "..." + this.to + ")";
    }
  };
```




```
> var r = new Range( 1, 3 );

> r.includes( 2 )
true

> console.log( r.toString() )
(1...3)
```



var *or not* var…

that's the question…

```
var foo = 10;

myFunction = function() {
  var foo = 20;

  (function() {             // Execute an anonymous function.
    var wibble = 1;
    foo = 30;
  }());
  console.log( foo );       // What is foo?
};

myFunction();
console.log( foo );         // What is foo?
```

- How to include JavaScript in a webpage?
  - Inline, between a pair of `<script>` and `</script>` tags.
  - From an external `*.js` file specified by the `src` attribute of a `<script>` tag.
  - In an HTML event handler attribute, such as `onclick` or `onmouseover`.
  - In a URL that uses the special `javascript:` protocol.

```
<a href="javascript:alert( new Date().toLocaleTimeString() );”>
        Check the time!
</a>
```

- **A**synchronous **J**avascript **A**nd **X**ML.
  - An architecture for web applications that features scripted HTTP.
  - Avoids page reloads.
  - Makes web applications look and feel like desktop applications.
- The `XMLHttpRequest` object defines the API for scripted HTTP.
  - We have to use it in the same order as the HTTP requests parts:
    - HTTP method and URL – `request.open( "GET", "/your/url" );`
    - Optional headers - `request.setRequestHeader( "Content-Type", "text/plain" );`
    - Optional request body – `request.send( optionalBody );`

- What does this function do? Is anything missing?

```
function postMessage( msg )
{
   var request = new XMLHttpRequest(); // New request.
   request.open( "POST", "/log.php” ); // POST to a server script.

   // Send the message, in plain-text, as the request body.
   request.setRequestHeader( "Content-Type",
     "text/plain;charset=UTF-8” );

   request.send( msg );
}
```

- Retrieving the server's response (from GET request)

```
function getText( url, callback )
{
   var request = new XMLHttpRequest();   // Create new request.
   request.open( "GET", url );           // Specify url to fetch.
   request.onreadystatechange = function()
      {
         // If the request is complete and was successful.
         if( request.readyState === 4 && request.status === 200 )
         {
            var type = request.getResponseHeader( "Content-Type" );
            if( type.match( /^text/ ) )  // Is response text?
               callback(request.responseText); // Pass it to callback
         }
      };
   request.send( null );                 // Why null here?
}
```

- Retrieving the server's response (from POST request)

```
function postData( url, data, callback )
{
   var request = new XMLHttpRequest();
   request.open( "POST", url );

   request.onreadystatechange = function()
      {
         if( request.readyState === 4 && callback )
            callback( request );
      };
   request.setRequestHeader( "Content-Type",      // Set content type.
      “application/x-www-form-urlencoded” );

   request.send( encodeFormData( data ) );        // Send form-encoded
}                                                 // data.
```

- **J**ava**S**cript **O**bject **N**otation

```
o = {x:1, y:{z:[false,null,""]}};      // Define a test object.

s = JSON.stringify(o);     // s = '{"x":1,"y":{"z":[false,null,""]}}'.

p = JSON.parse(s);         // p is a deep copy of o.
```

- How do we use `eval()` instead of `parse()`?

HTML5

- The new <canvas> tag:
  - Works with JavaScript to generate computer graphics in your browser.

```
...
<body>
<canvas id="myCanvas" width="800" height="600"></canvas>
        <script>
        var canvas = document.getElementById( 'myCanvas' );
        var context = canvas.getContext( '2d' );

        context.font = '40pt Calibri’;
        context.fillStyle = '#ffffff’;
        context.fillText( 'Hello World!', 150, 100 );
...
```


http://www.html5canvastutorials.com/
http://www.effectgames.com/demos/canvascycle/

Cookies

- A small amount of named data stored by the web browser, and associated with a particular website.

Cookies

- Cookies are strings containing
  - **name** = *value*;
  - **path** = *path*;
  - **domain** = *domain*;
  - **max-age** = *seconds*;
  - **secure**;
- To delete them we set their **max-age to zero** and their **value to “”** by using the same *name*, *path*, and *domain*.

- In a Java Servlet

```
Cookie c = new Cookie( "color",
  "#abcdef" );

c.setPath( "/" );

c.setMaxAge( 24*60*60 );

response.addCookie( c );
```

- In JavaScript

```
document.cookie = "color=red;
    domain=localhost;
    path=/;
    max-age=1000”;
```