

JavaScript

(a minimal introduction)

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History

- Began as LiveScript in 1995 (Netscape)
- Renamed early to ride on Java popularity
- Not Java, nor reduced scripting form of Java
- Microsoft: JScript, VBScript
- Standard: ECMAScript

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JavaScript vs. Java Applets

- Both execute on client
- JavaScript interpreted, Java compiled
- JavaScript embedded in html page, applet is separate download
- JavaScript simpler than Java
- JavaScript specific to web pages, Java general purpose

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Warnings

- Can do lots of bad things, e.g.,
 - bells and whistles that distract
 - create browser dependence
- Can't protect your code
- People can and do turn javascript off

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Basics

- Code looks a little Java-like (semicolons optional but encouraged)
- Similarities
 - `obj.method()`, imperative control flow, primitive/reference variables, comments `//`, `/**/`
- Differences
 - (procedural), no (static) types, no data abstraction

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Basics cont.

- Put code in web page inside tags:
`<script type="javascript">...</script>`
- Executed by browser when it reads html
- Output is html embedded inline with document
 - produce html text
 - respond to user events
 - display alerts and open new windows
 - validate input

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Language: Data Structures

- **Variables:** `var varName = value;`
 - no explicit types
 - local to function or global to whole page
- **Arrays:** `var A = new Array(3);`
 - accessor `A[1]`, `A.length` property
 - methods, e.g., `A.concat()`, `A.join()`, `A.sort()`
- **Date object:** `var D = new Date();`
 - `D.getTime()`
- **Math object**
 - `Math.PI`, `Math.random()`, `Math.floor()`, `Math.sin()`,...

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Language: Flow Control

- **Function declarations (must come before use)**
 - typically in the `<head>` `</head>` of document
 - `function f(a,b) { ... return x; }`
- **Conditionals**
 - `if () { } else { }`
 - `switch ()`
- **Iteration**
 - `for (i=1; i<10; i++) { }`
 - `while () { }`
 - `do { } while ()`

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Browser Object Model (BOM)

- window
 - document
 - anchors[]
 - forms[]
 - elements[]
 - links[]
 - frames[]
 - navigator
 - history
 - location

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Document Object Model (DOM)

- DOM provides API that exposes a web page to a programming language
- HTML document is represented as a tree following the structure of the HTML doc
 - html
 - head
 - title
 - body
 - h1
 - hr
 - p

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Events

- Not inside `<script> </script>`
- `onMouseOver`
`link`
- `onClick`, `onFocus`, `onSubmit`,...
 - often used for validating form data
- `onLoad`, `onUnload`
 - appear in `<body>` tag
- Usually call function (defined in `<head>`)