

setka

16.11.2016



# Обзор инструментов для фронтенд- разработки

Егор Яковишен  
frontend team lead  
[@yaplusplus](https://twitter.com/yaplusplus)

PostCSS

полифиллы

npm

Less

gulp

Pug (Jade)

git

grunt

webpack

autoprefixer

Babel

Sass

Chrome  
Developer  
Tools

Bower

Browserify

mocha

- Привет, как прошел хакатон?
- Нормально, настроили Webpack и Babel...

# ~10 лет назад

- HTML-страницы генерировались на сервере и отдавались в браузер
- «Ванильные» HTML и CSS
- Windows XP + IE 6
- ES3, Flash
- Отладка JavaScript при помощи alert

# Internet Explorer 6

**Wikipedia, the free encyclopedia - Microsoft Internet Explorer**

File Edit View Favorites Tools Help

Back Favorites Address [https://en.wikipedia.org/wiki/Main\\_Page?useskin=monobook](https://en.wikipedia.org/wiki/Main_Page?useskin=monobook) Go Links

create account log in

[main page](#) [talk](#) [view source](#) [history](#)

Welcome to Wikipedia,  
the free encyclopedia that anyone can edit.  
4,628,166 articles in English

**From today's featured article**

 The *Analytical Review* was a periodical established in London in 1788 by the publisher Joseph Johnson (pictured) and the writer Thomas Christie. Part of the Republic of Letters, it provided summaries and analyses of new publications and acted as a forum for radical political and religious ideas. Although it aimed at impartiality, its articles were often critical of the British government and supportive of the French revolutionaries. While the journal had low circulation numbers for its day, it still influenced popular opinion and was feared by

**In the news**

- **Comet Siding Spring** makes a very close approach to Mars (artist's rendering pictured) and is observed by means of surface rovers and satellites.
- At least 39 people are killed in Nepal's worst **snowstorm disaster** around the mountains of Annapurna and Dhaulagiri.
- **Jean Tirole** is awarded the Nobel Memorial Prize in Economic Sciences for his analysis of market power and

navigation

- Main page
- Contents
- Featured content
- Current events
- Random article
- Donate to Wikipedia
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search

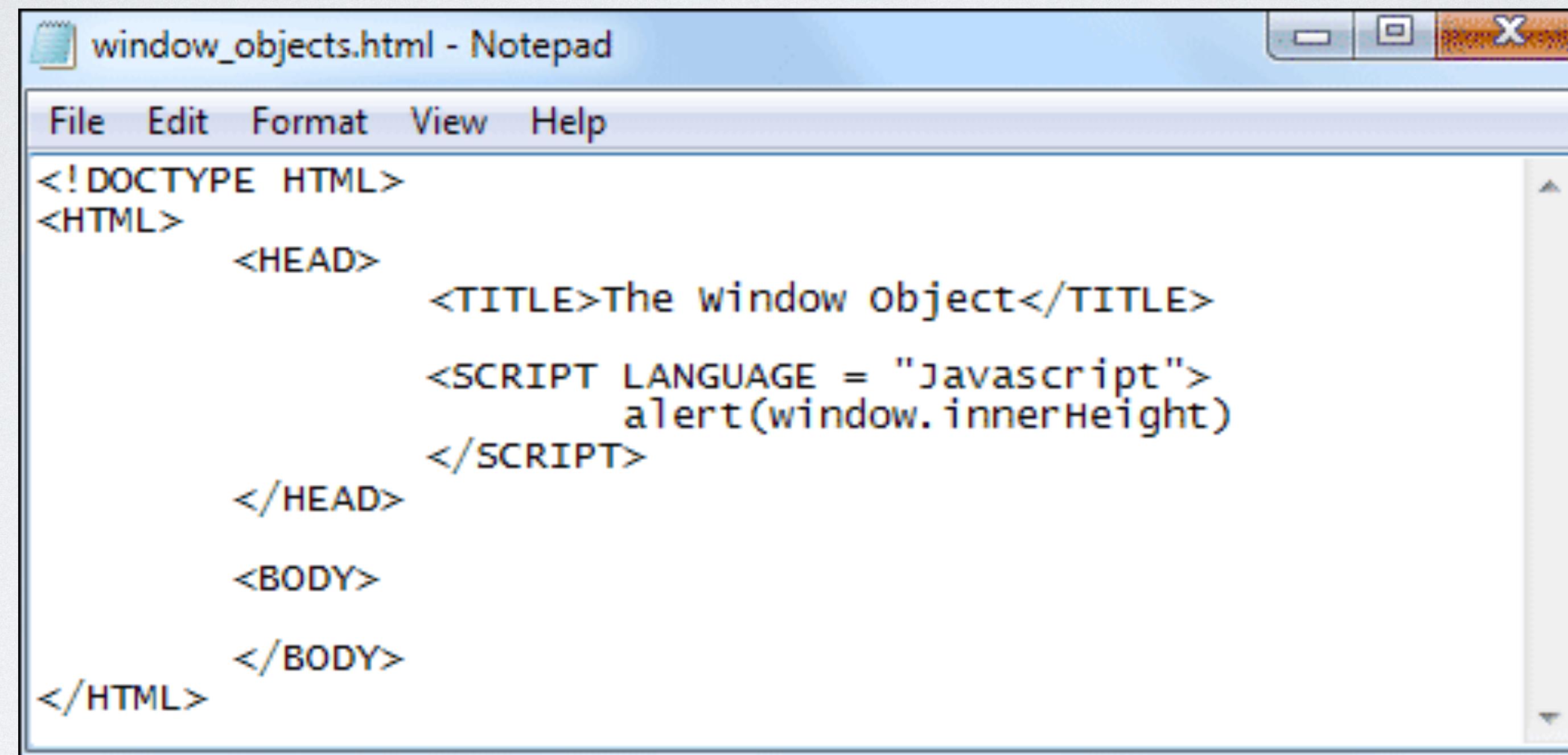
Go Search

interaction

- Help
- About Wikipedia

Internet

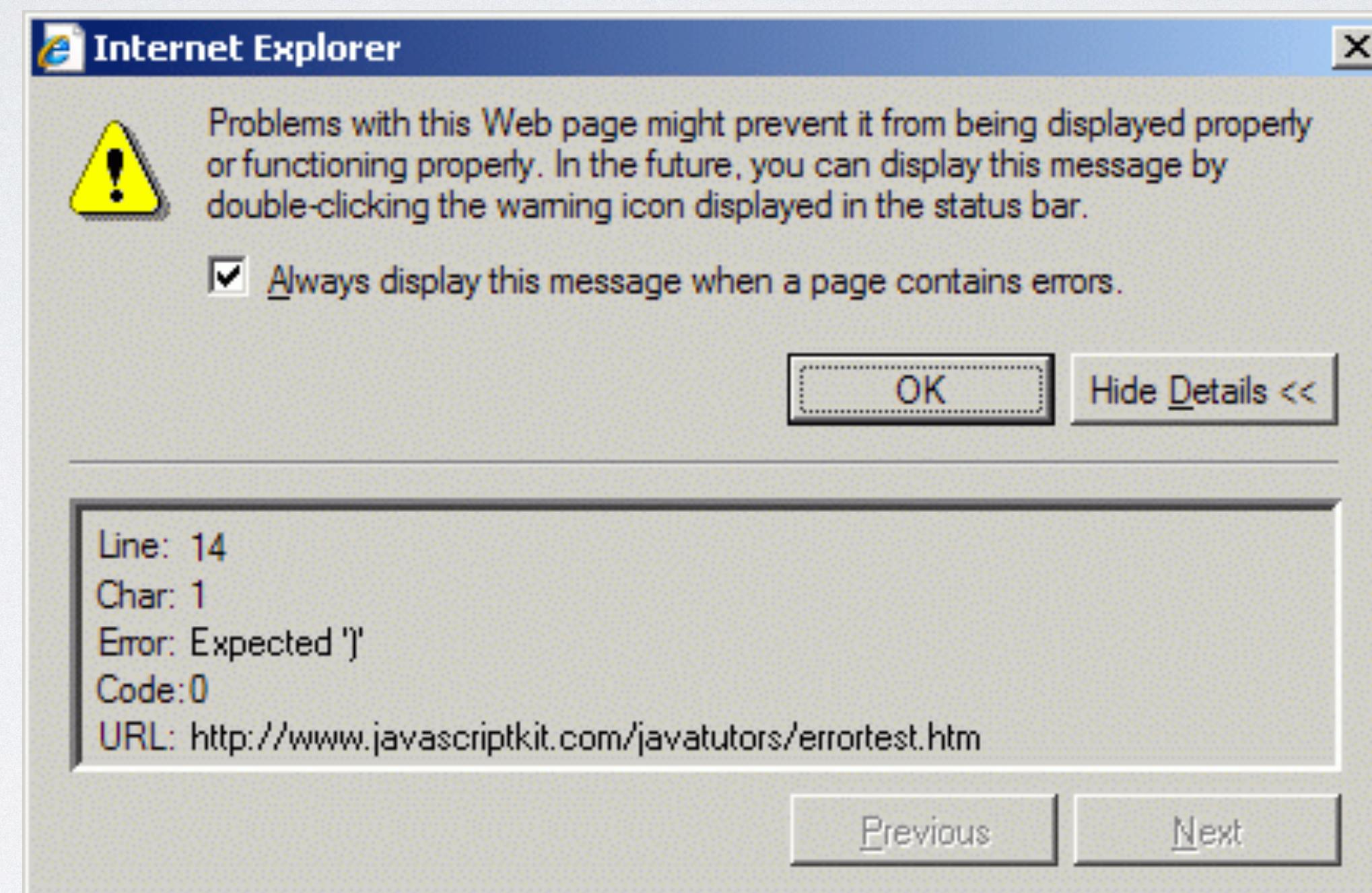
# Разработка в Блокноте



The screenshot shows a Microsoft Notepad window titled "window\_objects.html - Notepad". The window contains the following HTML code:

```
<!DOCTYPE HTML>
<HTML>
    <HEAD>
        <TITLE>The window object</TITLE>
        <SCRIPT LANGUAGE = "Javascript">
            alert(window.innerHeight)
        </SCRIPT>
    </HEAD>
    <BODY>
    </BODY>
</HTML>
```

# Отладка при помощи alert



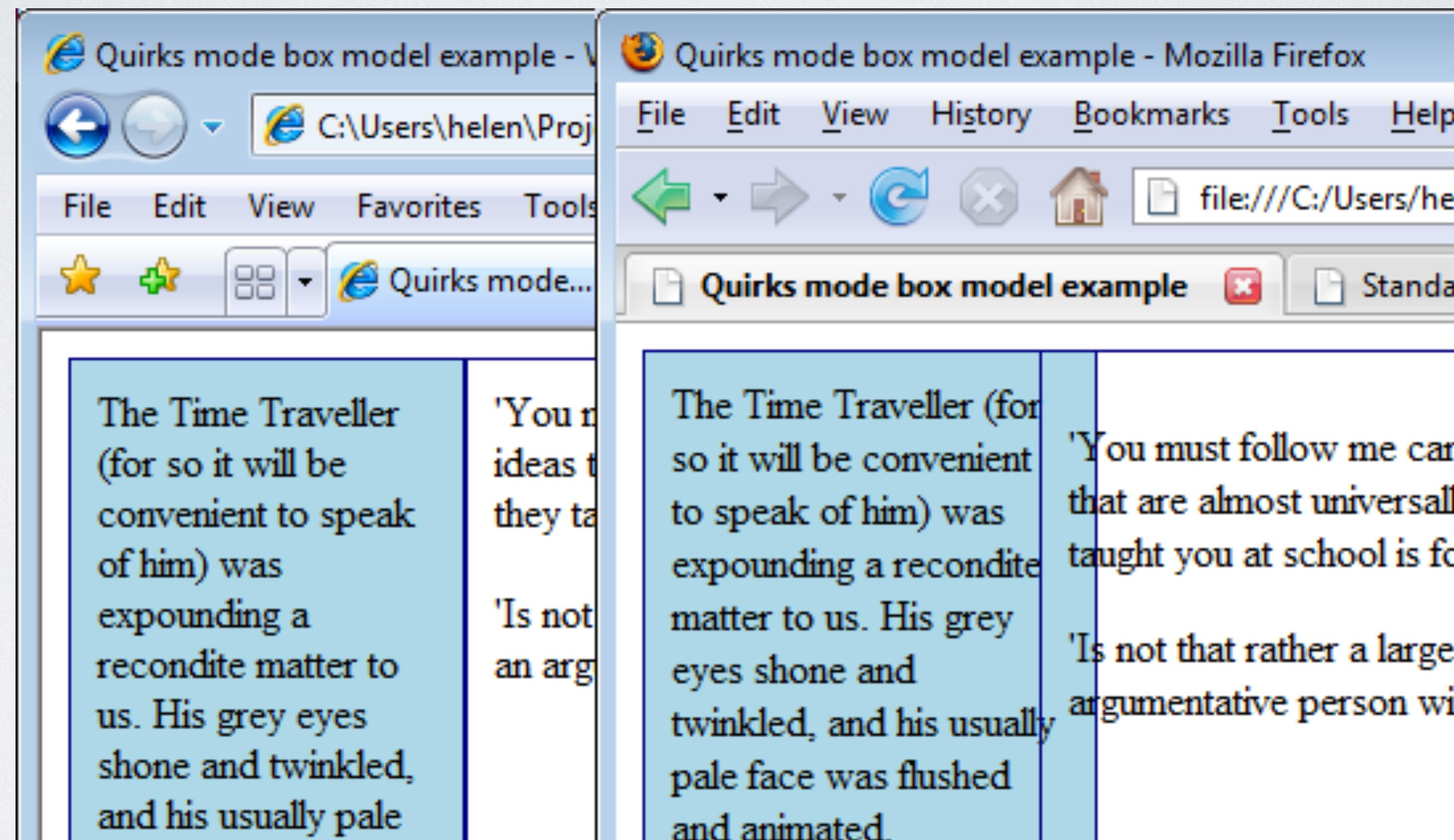
: - )



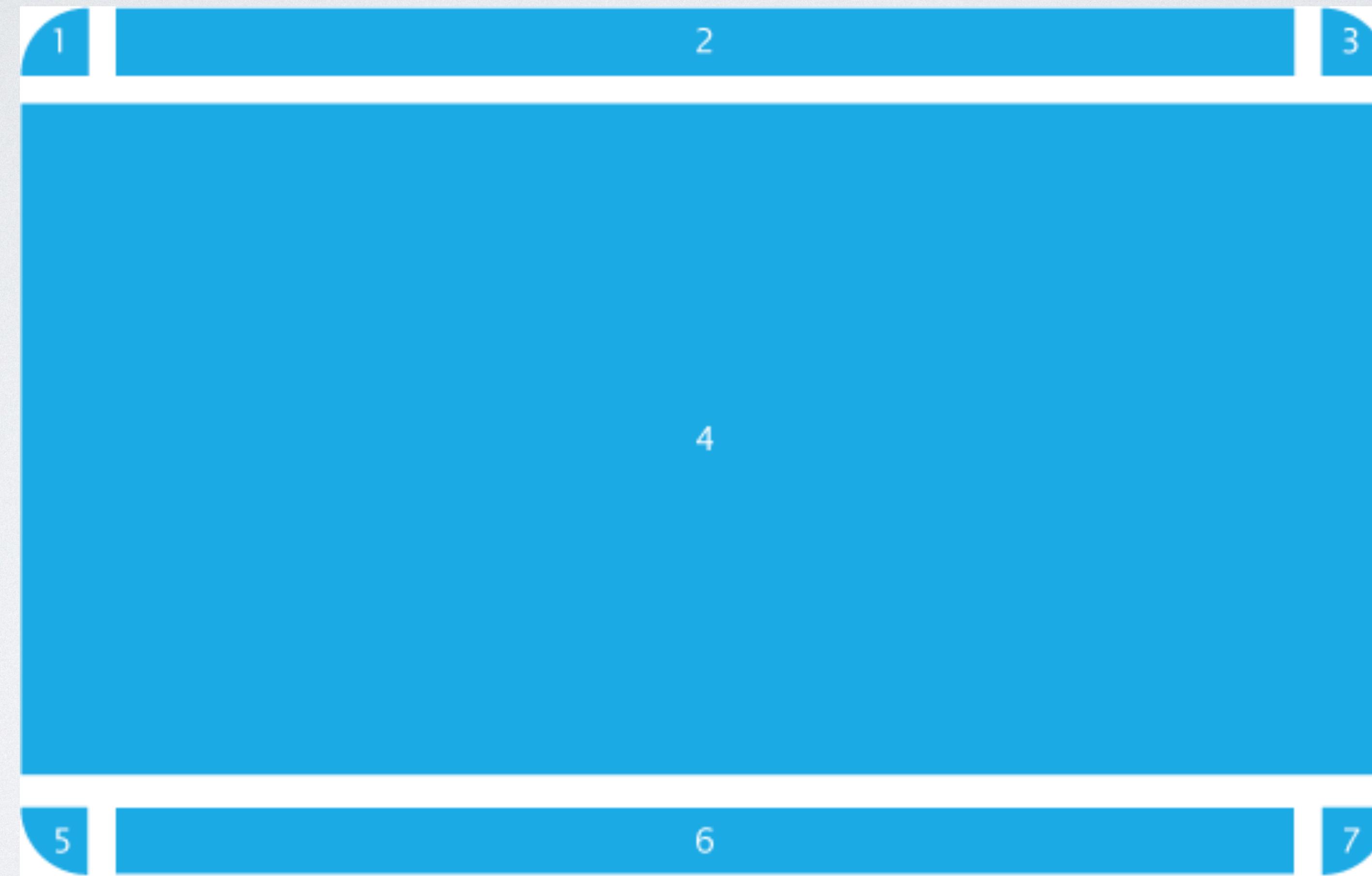
# Проблемы

- Различия между браузерами
- Несоответствие стандартам W3C
- Ограниченные возможности CSS
- Тесная связка фронтенда и бэкенда
- Отсутствие культуры коллективной работы

# Различия в box model



# Закругленные уголки



# Переломный момент

- От сайтов к веб-приложениям
- 2004 – Gmail, 2005 – Google Maps
- AJAX и SPA
- Браузер – основная среда выполнения
- JavaScript отвечает за логику приложения

# Gmail (2004)

The screenshot shows the original Gmail interface from 2004. At the top, there's a navigation bar with links for @gmail.com, New Features!, Settings, Help, and Sign out. Below the bar, the Gmail logo and BETA status are visible. A search bar and search buttons for Mail and the Web are present. On the left, a sidebar includes links for Compose Mail, Archive, Report Spam, More Actions ..., Refresh, and a list of inbox categories: Starred (1), Sent Mail, Drafts, All Mail, Spam (15), Trash, and Contacts (New!). A 'Labels' section lists Blog Posts (66), Cool Stuff, Family Stuff, Stuff to read, Website, and Edit labels. The main area displays an inbox with 50 messages. The first message is from 'blo.gs' with the subject 'updated weblogs from blo.gs - change your settings: http://blo.gs/settings.php here is your list of updated weblog...'. Other messages include emails from Dell Small Business, palmOne, Inc., What's New Now Specia., PC Magazine, Deals on The Web, G4TechTV Newsletter, Inside PC Magazine, Mac Design Staff, PC Magazine TrendWatch, eDiets Extra, G4TechTV Week, and Brad, me (14). The interface uses a light blue and white color scheme with a vertical sidebar on the right.

From	Subject	Date
blo.gs	updated weblogs from blo.gs - change your settings: http://blo.gs/settings.php here is your list of updated weblog...	6:50am
Dell Small Business	Only you hold the key to great Dell savings! - Make sure you receive your e-mail from Dell Small Business. Add subscri...	6:35am
palmOne, Inc.	Announcing the New palmOne Tungsten T5 handheld - The content of this message is based on your palmOne Newsl...	Oct 4
What's New Now Specia.	Exclusive savings on Dell desktops for our subscribers. - Visit Dell.com Save with Special Offers From Dell FREE Flat ...	Oct 4
PC Magazine Tip of th.	Today's Tip: Excel Fails to Store Credit Card Numbers - PCMag.com HOME   REVIEWS   DOWNLOADS   SOLUTIONS   NE...	Oct 4
Deals on The Web	DOW Daily - Win a 128MB USB Memory Watch - Deals at Deals On The Web for Monday, October 04, 2004 <http://ww...	Oct 4
PC Magazine ProductWi...	First Looks: Video Editing For Non-Pros; 3D Display For T... - PCMag.com HOME   REVIEWS   DOWNLOADS   SOLUTION...	Oct 4
G4TechTV Newsletter	The Screen Savers Today - A pretty image is supposed to go here instead of this text. If you're seeing this text, your ...	Oct 4
Inside PC Magazine On...	CD and DVD Burners and Card Readers in Harmony; This Week... - PCMag.com HOME   REVIEWS   DOWNLOADS   SO...	Oct 4
Mac Design Staff	Mac Design Tip of the Day 10.4.04 - photoshop illustrator flash dreamweaver indesign golve after effects quarkxpres...	Oct 4
PC Magazine TrendWatch	Athlon 64 Gets on the PCI Express Bus; Inside the JPEG Vi... - PCMag.com HOME   REVIEWS   DOWNLOADS   SOLUTIO...	Oct 4
blo.gs	updated weblogs from blo.gs - change your settings: http://blo.gs/settings.php here is your list of updated weblogs. O...	Oct 4
G4TechTV Newsletter	G4techTV Week - A pretty image is supposed to go here instead of this text. If you're seeing this text, your ...	Oct 4
eDiets Extra	How I Lost 79lbs, 7 Sizes (great photos) - Feeling Fat? Depressed About Your Weight? Click Here my diet   success st...	Oct 4
blo.gs	updated weblogs from blo.gs - change your settings: http://blo.gs/settings.php here is your list of updated weblogs. O...	Oct 3
Brad, me (14)	GLite - curl - You can power it on my installation of GMailer. Would that work? On Sat, 2 Oct 2004 14:10:14 ...	Oct 2
Audible Recommends	Bush vs. Kerry: First Presidential Debate Is Yours, Compl... - Dear Sam, The first presidential debate between George ...	Oct 2
blogdex-verify	blogdex verification for http://www.theplaceforitall.com/... - thank you for registering with blogdex to complete your re...	Oct 2

# Google Maps (2005)

Google Maps – from: 602 townsend street, san francisco, ca to: 345 park avenue, san jose, ca  
<http://maps.google.com/>

**Maps Local Search Directions**

602 townsend street, san francisco, ca → 345 park avenue, san jose, ca

Start address End address

**Maps**

Map - Satellite [New!](#)

[Print](#) [Email](#) [Link to this page](#)

**Start address:** 602 Townsend St  
San Francisco, CA 94103,  
USA

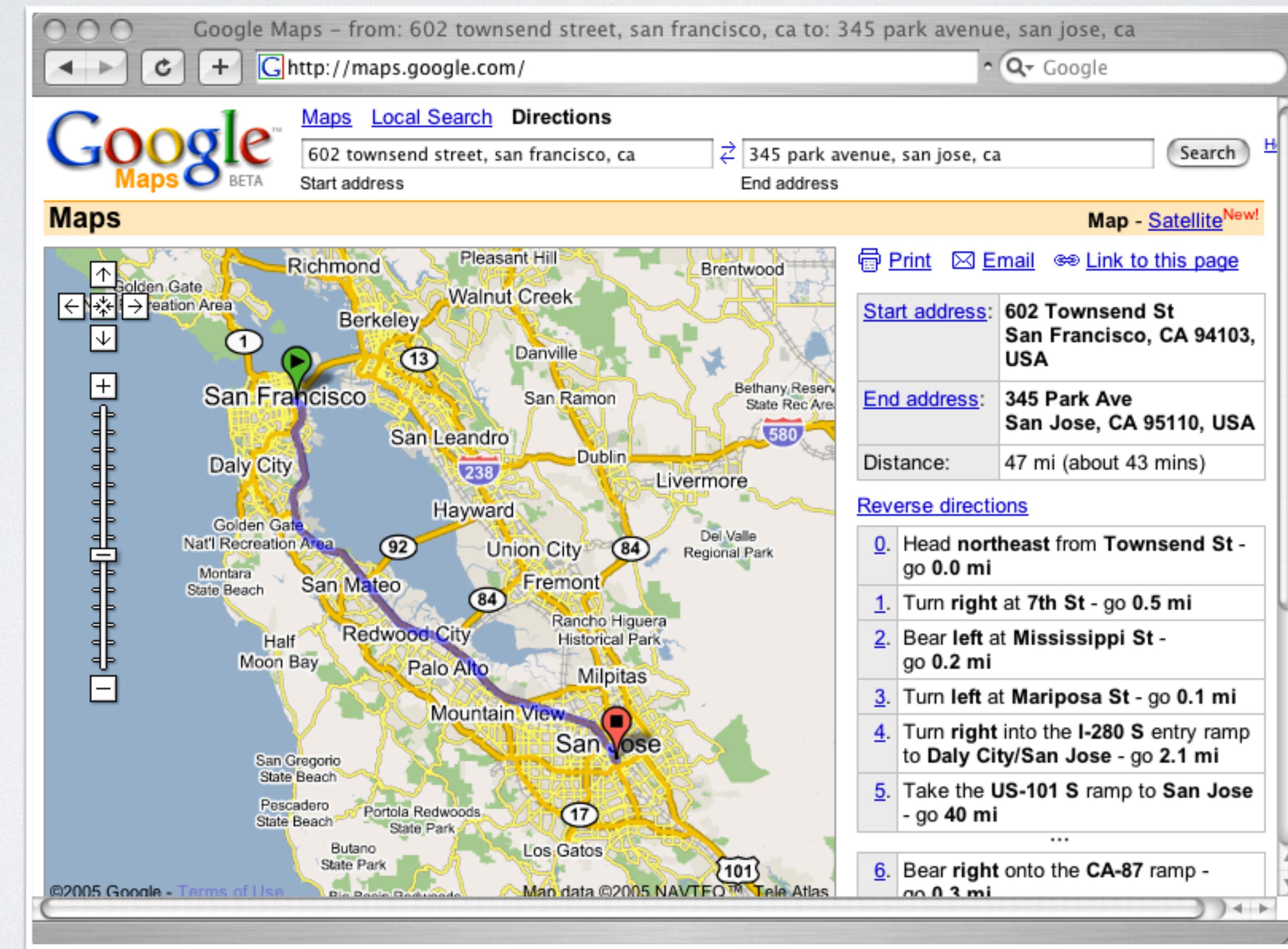
**End address:** 345 Park Ave  
San Jose, CA 95110, USA

**Distance:** 47 mi (about 43 mins)

**Reverse directions**

0. Head **northeast** from **Townsend St** - go 0.0 mi
1. Turn **right** at **7th St** - go 0.5 mi
2. Bear **left** at **Mississippi St** - go 0.2 mi
3. Turn **left** at **Mariposa St** - go 0.1 mi
4. Turn **right** into the **I-280 S** entry ramp to **Daly City/San Jose** - go 2.1 mi
5. Take the **US-101 S** ramp to **San Jose** - go 40 mi
- ...
6. Bear **right** onto the **CA-87** ramp - go 0.3 mi

©2005 Google - [Terms of Use](#) Map data ©2005 NAVTEQ™ Tele Atlas



# Facebook (2006)

facebook

Matt Cahill's Profile (This is you)

home search browse share invite help logout

Facebook



**Matt Cahill**  
Facebook  
Iowa State Alum  
Silicon Valley, CA

Email: mcahill@facebook.com  
AIM Screenname: lacuna arcana  
Mobile: 319.378.1965  
Sex: Male  
Interested In: Women

► Mini-feed

▼ Personal Info [edit](#)

Political Views: Moderate  
Interests: Web Design, Photography, Almost All Music, Tennis, Nintendo DS Lite  
Favorite Music: Zero 7, Air, Beatles, Imogen Heap, Acceptance, Coldplay, Massive Attack, Belle & Sebastian, Jurassic 5, Blackalicious, Björk, Scissor Sisters, Daft Punk, Theivery Corporation, BT, Beck, Wilco, Deathcab for Cutie, Utada Hikaru, Way Out West, Radiohead, The Streets, Cake, Chemical Brothers, Moby, Fischerspooner, High and Mighty Color  
Favorite TV Shows: Lost, Family Guy, Firefly, Bleach, Battlestar Galactica  
Favorite Movies: Harold and Kumar Go to White Castle, The Incredibles, Zoolander, Kill Bill, Ferris Bueller's Day Off, Fight Club, Boondock Saints, Office Space, American Beauty, Stargate, Dogma, Super Troopers, Wayne's World, Ocean's Eleven, Primer  
Favorite Quotes: "Drama is life with the dull bits cut out." - Alfred Hitchcock

[View More Photos of Me \(143\)](#)  
[Read Notes about Me \(1\)](#)  
[Edit My Profile](#)  
[Edit My Picture](#)  
[Edit My Privacy](#)  
[Create a Profile Badge](#)

Status [edit](#)

# jQuery (2006)



# Чего мы хотим?

- Больше удобства при написании и отладке HTML и CSS
- Работа с большими объёмами JavaScript-кода
- Улучшение JS как языка
- Автоматизация рутинных задач
- Тестирование фронтенд-кода
- Защита кода на стороне клиента
- Частые релизы

# Firebug

The screenshot shows a Mozilla Firefox window with the title "Welcome to Gmail - Mozilla Firefox". The address bar displays the URL <https://www.google.com/accounts/ServiceLogin?service=mail&passive=true>. The main content area shows the "Welcome to Gmail" page with various features listed: "A Google approach to email.", "Fast search", "Lots of space", "Chat right inside Gmail", and "Mobile access". To the right of the main content is a "Sign in to Gmail with your Google Account" form. The Firebug developer tool is open at the bottom of the screen, with the "HTML" tab selected. The "Elements" panel shows the HTML structure of the "Email" input field, which is highlighted with a yellow selection box. The "Styles" panel on the right shows the CSS rule ".gaia.le.val { font-family: Arial,Helvetica,sans-serif; font-size: smaller; }" with a status bar indicating "ServiceLogin (line 302)". The "Script" tab in Firebug is also visible.

Welcome to Gmail - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Getting Started Latest BBC Headlines the zen machine

Gmail by Google BETA Welcome to Gmail

A Google approach to email.

Gmail is a new kind of webmail, built on the idea that email can be more intuitive, efficient, and useful. And maybe even fun. After all, Gmail has:

**Fast search**  
Use Google search to **find the exact message** you want, no matter when it was sent or received.

**Lots of space**  
Over 4838.493593 megabytes (and counting) of free storage so you'll never need to delete another message.

**Chat right inside Gmail**  
It's just one click to chat with the people you already email. You can even save your chats in your Gmail account. [Learn more](#)

**Mobile access**  
Read Gmail on your mobile phone by pointing your phone's web browser to <http://mail.google.com>. [Learn more](#)

Sign in to Gmail with your Google Account

Username:

Password:

Remember me on this computer.

[I cannot access my account](#)

Sign up for Gmail

Inspect Edit | Input#Email.gaea

Console HTML CSS Script DOM Net Options

.gaia.le.val { font-family: Arial,Helvetica,sans-serif; font-size: smaller; }

Inherited from td

body, td, div, p, a, ServiceLogin (line 7)

Done www.google.com

# Chrome Developer Tools

The screenshot shows the Chrome Developer Tools interface with the following details:

- Elements Panel:** Shows the DOM tree of the page. The `<body>` node is selected. The page content includes an `<h1 id="hello">Hello!`, several `<p>` elements, and two `<a>` links.
- Styles Panel:** Shows the computed styles for the selected element. The `body` element has the following styles:
  - position: relative;
  - font-family: 'Roboto Condensed', 'Helvetica', 'Arial', sans-serif;
  - font-weight: 300;
  - background-color: #EAEAEA;
  - box-sizing: border-box;
  - min-height: 100%
- Color Picker:** A color picker is open, showing a gradient from black to red. It includes a color wheel, a vertical color bar, and a hex code field containing `#EAEAEA`.
- Source:** The styles are defined in `main.css:1`. The CSS code is:

```
html, body { width: 100%; height: 100%; margin: 0; padding: 0; } body { font-size: 16px; line-height: 1; color: #404040; }
```
- Find in Styles:** A search bar at the bottom of the Styles panel allows for searching through the applied styles.

# Инструменты разработчика в браузере

- Firebug, Chrome Developer Tools, Opera Dragonfly
- Возможности:
  - Просмотр и изменение DOM
  - Работа с CSS
  - Отладка, профилирование и выполнение JS
  - Мониторинг загрузки и рендеринга страницы

# Препроцессинг CSS



# Переменные

```
$blue: #3bbfce;  
$margin: 16px;  
  
.content-navigation {  
    border-color: $blue;  
    color:  
        darken($blue, 9%);  
}  
  
.border {  
    padding: $margin / 2;  
    margin: $margin / 2;  
    border-color: $blue;  
}
```



```
/* CSS */  
  
.content-navigation {  
    border-color: #3bbfce;  
    color: #2b9eab;  
}  
  
.border {  
    padding: 8px;  
    margin: 8px;  
    border-color: #3bbfce;  
}
```

# Вложенность

.scss .sass

```
table.hl {  
    margin: 2em 0;  
    td.ln {  
        text-align: right;  
    }  
}  
  
li {  
    font: {  
        family: serif;  
        weight: bold;  
        size: 1.2em;  
    }  
}
```

```
/* CSS */  
  
table.hl {  
    margin: 2em 0;  
}  
table.hl td.ln {  
    text-align: right;  
}  
  
li {  
    font-family: serif;  
    font-weight: bold;  
    font-size: 1.2em;  
}
```

# Миксины

.scss    .sass

```
@mixin table-base {
  th {
    text-align: center;
    font-weight: bold;
  }
  td, th {padding: 2px}
}

@mixin left($dist) {
  float: left;
  margin-left: $dist;
}

#data {
  @include left(10px);
  @include table-base;
}
```

```
/* CSS */

#data {
  float: left;
  margin-left: 10px;
}

#data th {
  text-align: center;
  font-weight: bold;
}

#data td, #data th {
  padding: 2px;
}
```

# Операторы

## While loop example

```
$i: 1;

.link {
    background: #333;

    @while $i < 4 {
        &.link-#{$i} {
            margin-right: $i * 20px;
        }
        $i: $i + 1;
    }
}

.link {
    background: #333;
}
.link.link-1 {
    margin-right: 20px;
}
.link.link-2 {
    margin-right: 40px;
}
.link.link-3 {
    margin-right: 60px;
}
.link.link-4 {
    margin-right: 80px;
}
```

SCSS

CSS

# PostCSS



-A-

# Синтаксический сахар

HTML



CSS

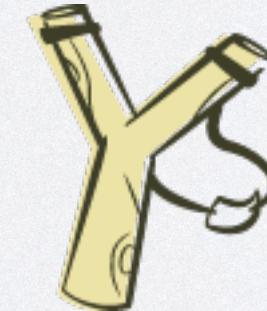


JS



Pug

Haml



# CoffeeScript

```
# Assignment:  
number: 42  
opposite_day: true  
  
# Conditions:  
number: -42 if opposite_day  
  
# Functions:  
square: x => x * x.  
  
# Arrays:  
list: [1, 2, 3, 4, 5]  
  
# Objects:  
math: {  
  root: Math.sqrt  
  square: square  
  cube: x => x * square(x).  
}  
  
# Array comprehensions:  
cubed_list: math.cube(num) for num in list.
```

```
var __a, __b, __c, __d, cubed_list, list, math, num,  
number, opposite_day, square;  
// Assignment:  
number = 42;  
opposite_day = true;  
// Conditions:  
if (opposite_day) {  
  number = -42;  
}  
// Functions:  
square = function(x) {  
  return x * x;  
};  
// Arrays:  
list = [1, 2, 3, 4, 5];  
// Objects:  
math = {  
  root: Math.sqrt,  
  square: square,  
  cube: function(x) {  
    return x * square(x);  
  }  
};  
// Array comprehensions:  
__a = list;  
__d = [];  
for (__b=0, __c=__a.length; __b<__c; __b++) {  
  num = __a[__b];  
  __d[__b] = math(cube)(num);  
}  
cubed_list = __d;
```

# Сладко?

.styl

```
p  
  font-size 10px  
  font-weight bold
```

.sass

```
p  
  font:  
    size: 10px  
    weight: bold
```

.css

```
p {  
  font-size: 10px;  
  font-weight: bold;  
}
```

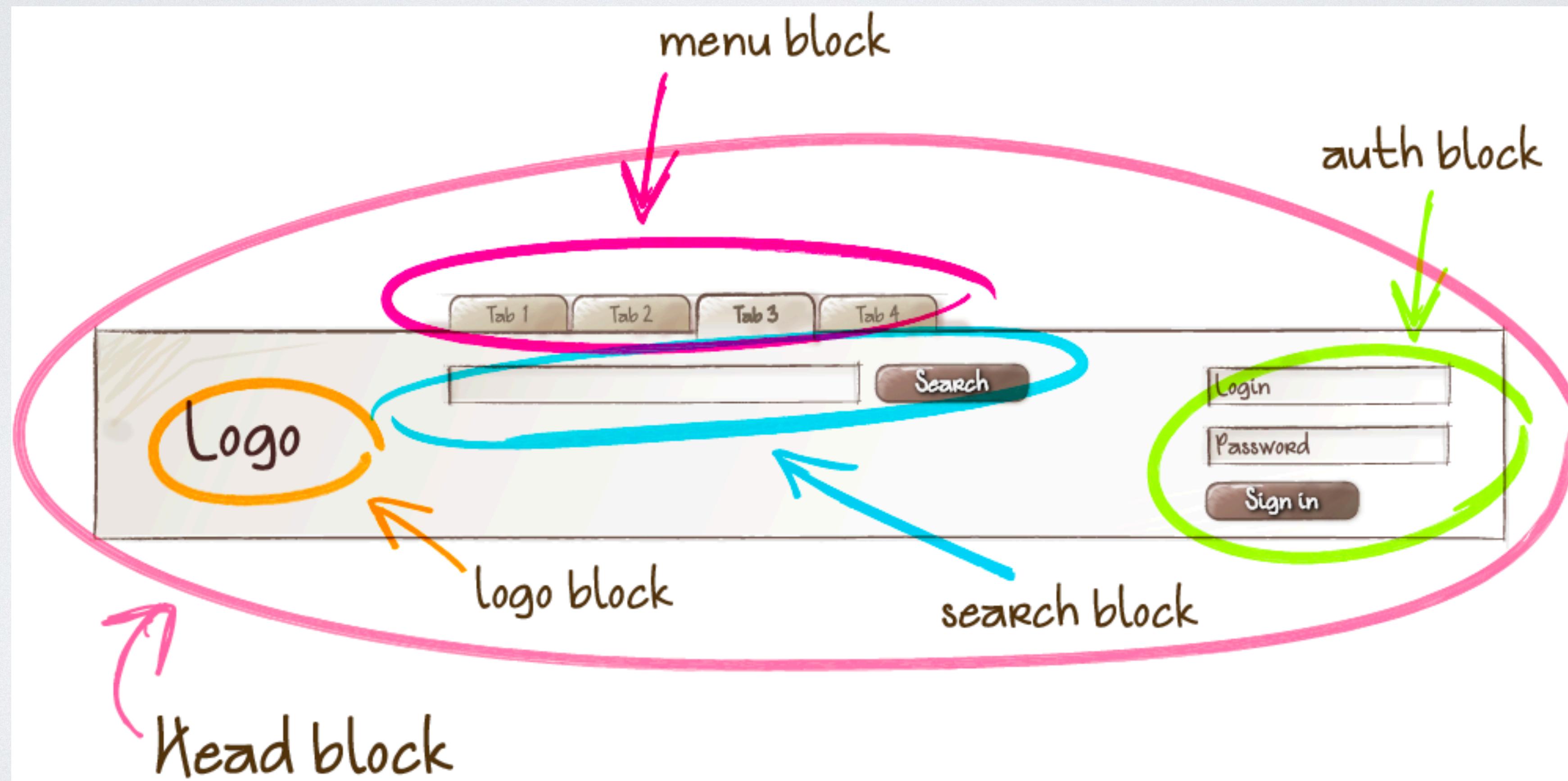
# Развитие JS

- ES5, ES6, ES...
- Расширение синтаксиса и новые парадигмы:  
JSX, TypeScript, ClojureScript, Elm
- Необходимость поддержки старых браузеров
- Полифиллы
- Транспиляция

# Модульность в CSS

- Родовая проблема CSS: глобальная зона видимости
- БЭМ, SMACSS и др.
- CSS Modules

# Модульность в CSS



# БЭМ

```
1 <body>
2   <header class="header">
3     <div class="header__logoContainer">
4       
5     </div>
6     <nav class="header__nav">
7       <ul>
8         <li class="nav__item nav__item--selected">home</li>
9         <li class="nav__item">about me</li>
10        <li class="nav__item">skills</li>
11        <li class="nav__item">portfolio</li>
12        <li class="nav__item">contact me</li>
13      </ul>
14    </nav>
15  </header>
```

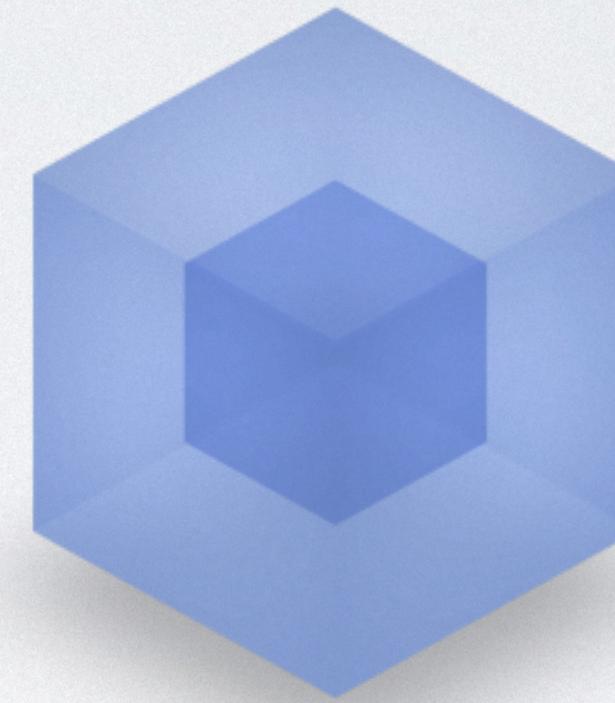
# CSS modules

Demo	
	<button>Click Me</button>
Widget1.css	Widget1.js
.button { border-radius: 4px; background- color: LightCyan; }	import React from 'react'; import styles from './Widget1.css'; // styles == { //   button: "Widget1_button_1FUOU" // }  class Widget1 extends React.Component { render() { return ( <button className={styles.button}> Click Me </button> ); } } export default Widget1;
Generated CSS	.Widget1_button_1FUOU { border-radius: 4px; background- color: LightCyan; }

# Модульность в JS

- Большие приложения складываются из множества маленьких кусочков
- Необходимость явного указания зависимостей
- RequireJS
- CommonJS
- ES6 modules

# Модульные приложения



**webpack**  
MODULE BUNDLER

# Подготовка кода к продакшну

- Минификация (сжатие)
- Аглификация (защита)
- Source maps

# Автоматизация

- Старые инструменты:
  - сложность использования
  - проблемы с кроссплатформенностью
  - сложность расширения

# node.js

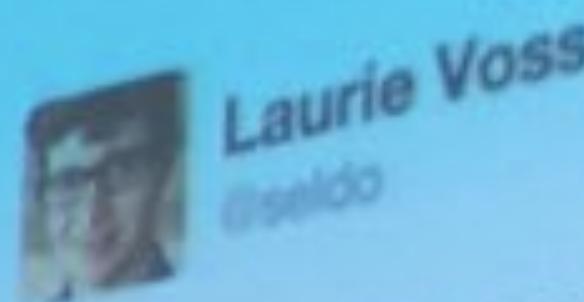
- JavaScript теперь не только в браузере
- Возможность писать изоморфные приложения
- Толчок к развитию инструментов

# NPM

- Крупнейший репозиторий пакетов
- Управление зависимостями
- Быстрая установка
- npm-таски



 Follow



Laurie Voss  
@seldo

So this happened. npm now has over  
200,000 packages, with 1,239,730 versions,  
or about 6 versions each.



200,327  
total packages

RETWEETS  
51

FAVORITES  
43



2:03 PM · 30 Oct 2015

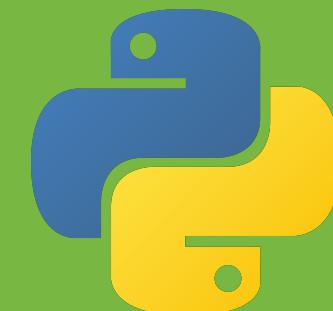
···

# 20万 packages!



353 943

~460 модулей в день



92 758

PyPi



117 123

Packagist



125 494

RubyGems



164 656

Maven Central

# Автоматизация



**GRUNT**



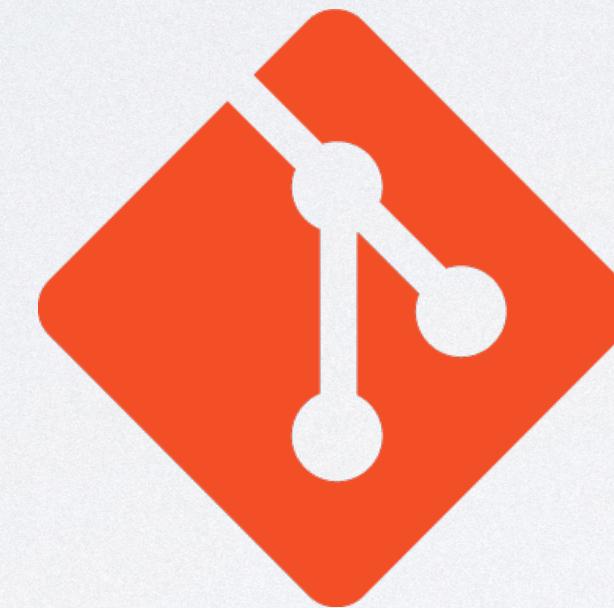
# Автоматизация

- **Grunt**
  - конфигурационный файл
  - работа с файловой системой
- **Gulp**
  - больше кода
  - использование node-потоков

# Тестирование

- Линтеры CSS и JS
- Типизация: Flow
- Тест-фреймворки: Jasmine, Mocha, Tape, Jest...
- Автоматическое тестирование в разных браузерах: Selenium и др.

# Системы контроля версий



git



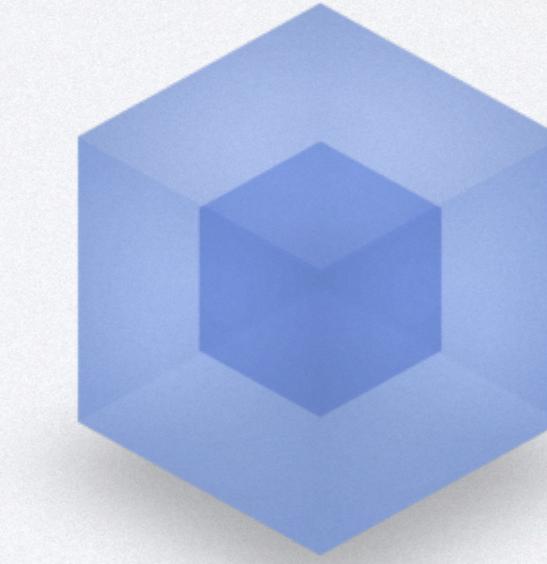
# Репозитории кода



# Деплой

- Continuous Integration & Delivery
- PaaS
- Heroku и др.

# Джентльменский набор



*BABEL*

**webpack**  
MODULE BUNDLER



# setka

Егор Яковишен  
FRONT-END TEAM LEAD

[yegor.yakovishen@me.com](mailto:yegor.yakovishen@me.com)  
[@yaplusplus](https://twitter.com/yaplusplus)  
FB: Yegor Yakovishen