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1-Introduction to client-side Applications

Course: Developing web-based applications

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Introduction

Advantages of web-based applications

- Web-based applications have many advantages over traditional applications:
  - Compatibility
    - Web-based applications run on the user's browser
    - HTML language ensures compatibility across platforms
  - Accessibility
    - Remote access is a design prerequisite
    - Mobile devices widely supported
    - There are many browser solutions for people with disabilities:
      - Automatic text readers
      - Different input devices
      - Font size and color adjustable

HTML Limitations

HTML was designed for:

- Maximizing browser compatibility
- Very efficient in the server-side (possibility to support many concurrent connections)
- Creating stunning content with dynamic features, but without compromising the previous two points.

HTML fails on the last point

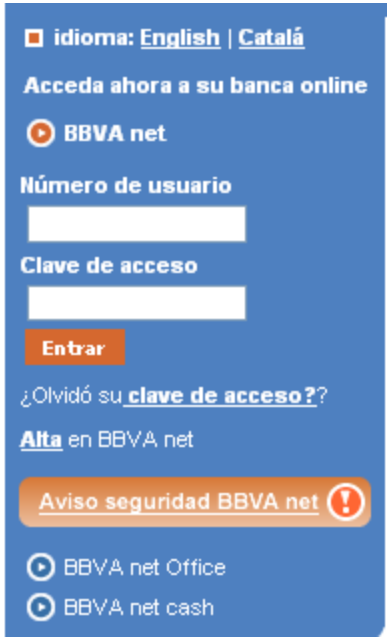
HTML Limitations

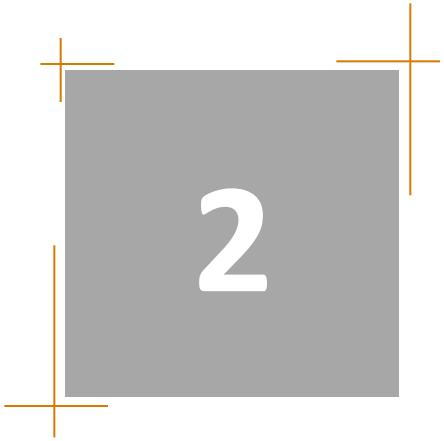
Some programming language is required to create small applications embedded in the web pages.

Examples:

- Shopping chart
- Counter of number of visits
- Webmail

- Login window

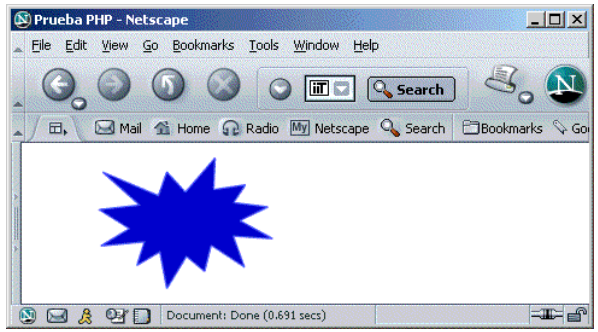




Client-side programming

Client-side

- The Browser downloads the code along with standard HTML
- Then the software runs in the browser



JavaScript

JavaScript example

- Syntax similar to Java (or similar to C)
- Integrated with standard HTML forms

```
<!doctype html public "-//w3c//dtd html 4.0 transitional//en">
<html>
<head>
  <title>JavaScript Example</title>
  <script language="JavaScript">
  <!-- Hide code if JavaScript is not supported

    ...JavaScript...

  //End of hidden code -->
  </script>
</head>
<body>
   ...HTML...
</body>
</html>
```

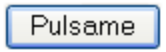
JavaScript utilities

- Using JavaScript it is possible to implement:
  - Form validation programs
  - Basic computation algorithms
  - Event handlers (ex. mouse hovering)
  - Calendars

VBScript example

- Similar to JavaScript, but smaller support
- Visual Basic Syntax

```
<HTML>
   <HEAD><TITLE>Prueba de VBScript</TITLE>
   <SCRIPT LANGUAGE="VBScript">
   <!--
   Sub Button1_OnClick
      MsgBox "Hola Mundo"
   End Sub
   -->
   </SCRIPT>
   </HEAD>
   <BODY>
   <FORM><INPUT NAME="Button1" TYPE="BUTTON" VALUE="Pulsame"></
     FORM>
   </BODY>
   </HTML>
```



Java Applets example

- An applet is a Java program designed to run inside the browser
- The applet is downloaded along with a web page and runs within a Java Virtual Machine to ensure security
  - Applet code:

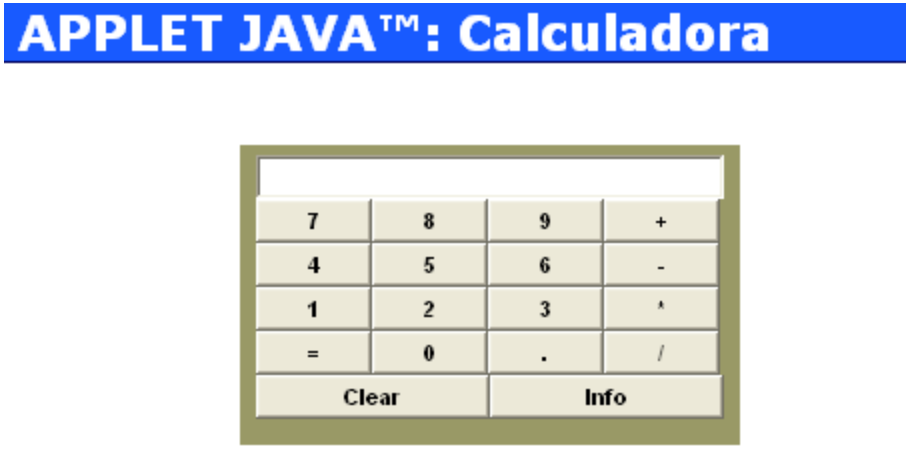
```
import java.awt.*;
import java.applet.*;
public class SimpleApplet extends Applet {
   public void paint (Graphics g){
                    g.drawString("Hola mundo",20,20);
   }
}
```

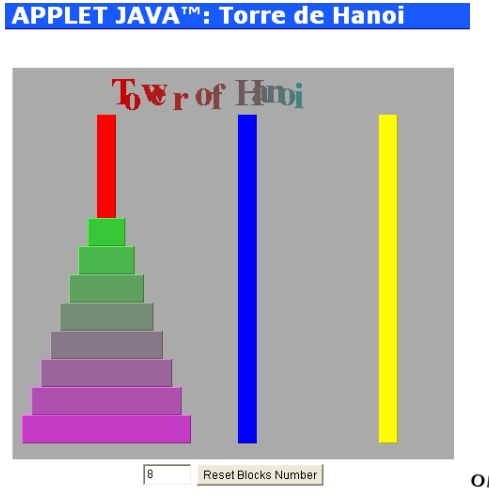
  - Inserting the applet inside HTML code:

```
<Applet code="SimpleApplet" width=200 height=60>
</applet>
```

Java Applets example 2

- Very extended support (multiplatform as Java)
- Good in security
- Procedure:
  - The browser downloads a web page from the server
  - The browser find the <applet> tag and requests the applet code
  - The applet code is run in a JVM (Java Virtual Machine)



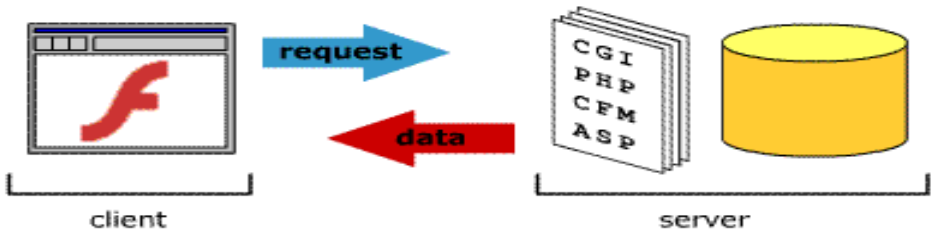


Active X example

- Similar to Java Applets
- Inserted in web pages with the tag <OBJECT>
- Important compatibility problems
- Important security threats

Adobe Flash

- Useful for animations, but also for developing applications.
- The latest versions include database modules
- Flash may interact with other technologies
- Security concerns increase as new features are added



Adobe Flash examples

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JavaScript easy program

JavaScript fundamentals

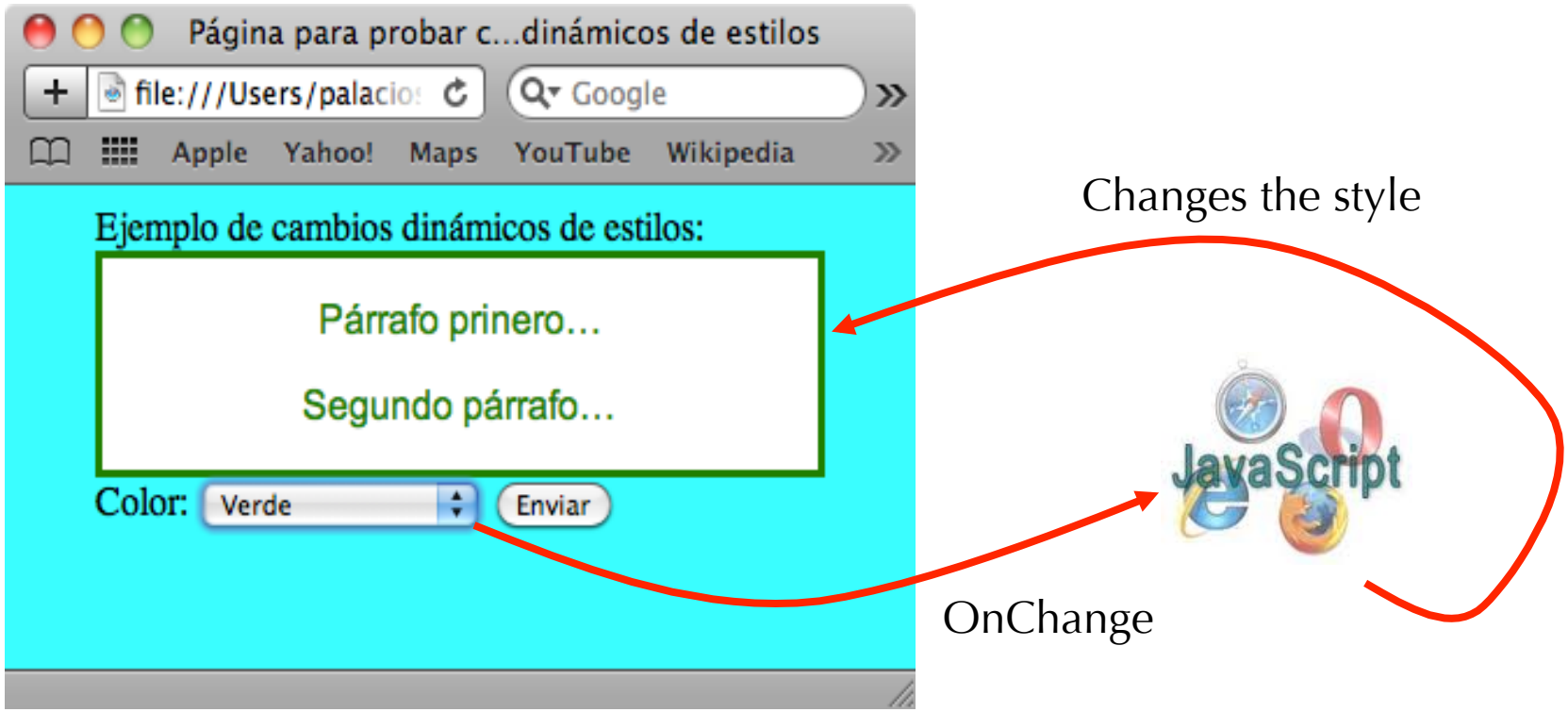
1. JavaScript code is written in the <head> section of the HTML page

2. JavaScript functions respond to objects events. Examples:
   - OnChange
   - OnSubmit

3. JavaScript functions are able to modify any object property. Examples:
   - Text color
   - Background color
   - Text content (the text itself)

Dynamic Styles

- A web site can behave as an application if CSS styles are linked to forms and JavaScript functions.



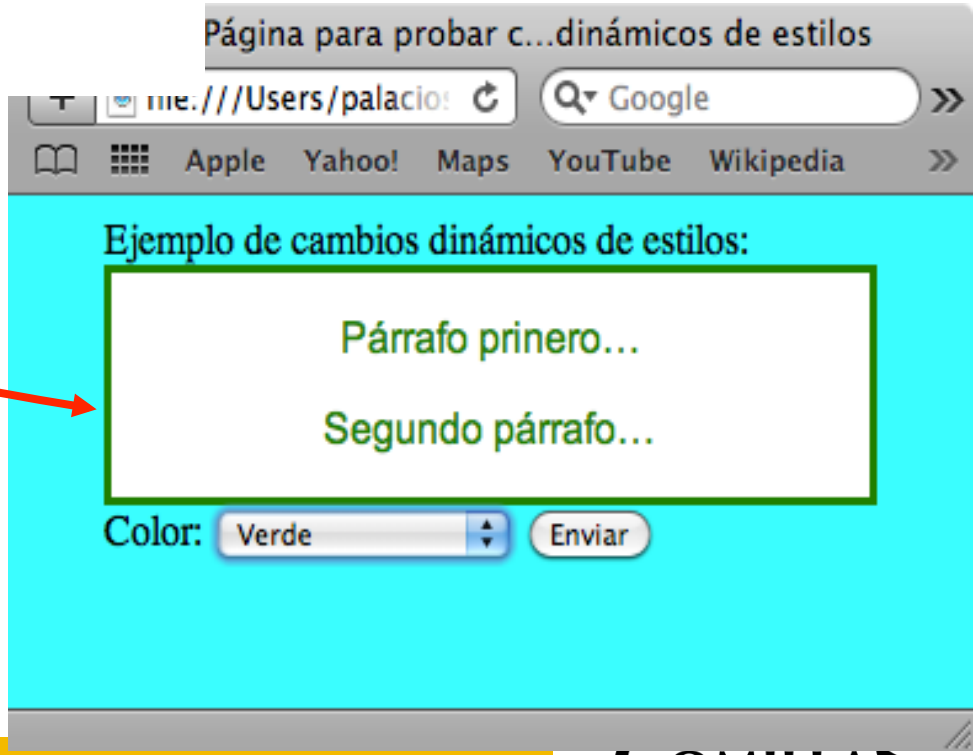
Dynamic Styles

- div object with style type “cuadro” named “id_cuadro1”

```
<DIV class="cuadro" id="id_cuadro1">
<p>Párrafoprinero…</P>
<p>Segundo párrafo…</p>
</DIV>
```

mis_estilos.css

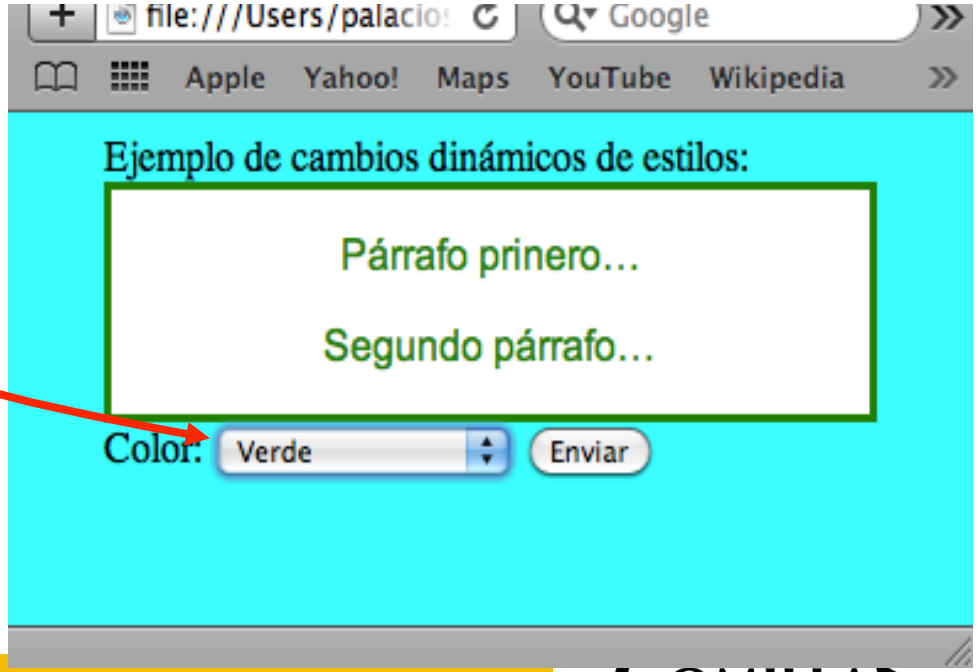
```
div.cuadro {
   font-family:arial,helvetica,sans-
serif;
color:black;
   background: white;
   text-align:center;
   border-style:solid;
}
```



Dynamic Styles

- <select> object to call a JavaScript for events type "OnChange"

```
<SELECT NAME="colores" OnChange="CambiarColor(this.value,'id_cuadro1');">
<OPTION VALUE="">--Elegir color--</OPTION>
<OPTION VALUE="r">Rojo</OPTION>
<OPTION VALUE="g">Verde</OPTION>
<OPTION VALUE="b">Azul</OPTION>
</SELECT>
```



Dynamic Styles

- Form code

```
<FORM ACTION="http://www.iit.upcomillas.es/cgi-bin/test-cgi" METHOD="POST">
Color:
<SELECT NAME="colores" OnChange="CambiarColor(this.value,'id_cuadro1');">
   <OPTION VALUE="">--Elegir color--</OPTION>
   <OPTION VALUE="r">Rojo</OPTION>
   <OPTION VALUE="g">Verde</OPTION>
   <OPTION VALUE="b">Azul</OPTION>
</SELECT>
<INPUT TYPE="submit" VALUE="Enviar">
</FORM>
```

Dynamic Styles

- JavaScript function defined on <HEAD>

```
<HEAD>
    <TITLE>Página para probar cambios dinámicos de estilos</TITLE>
    <LINK href="mis_estilos.css" type="text/css" rel="stylesheet">

    <SCRIPT type="text/javascript">
        function CambiarColor(color,nombre_objeto)
        {
            var objeto=document.getElementById(nombre_objeto);
            if (color=="r") objeto.style.color="red";
            if (color=="g") objeto.style.color="green";
            if (color=="b") objeto.style.color="blue";
        }
    </SCRIPT>
</HEAD>
```

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