



UNIVERSITETI I PRISHTINËS "HASAN PRISHTINA"
FAKULTETI I INXHINIERISË ELEKTRIKE DHE KOMPJUTERIKE

Lënda: Programimi në Internet

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Ora: Grupi i I-rë – prej 17:00 deri në 18:30

Pjesëmarrja është OBLIGATIVE!



UNIVERSITETI I PRISHTINËS “HASAN PRISHTINA”

FAKULTETI I INXHINIERISË ELEKTRIKE DHE KOMPJUTERIKE

Java: I (e parë) - Ushtrime

Tema: HTML 5 – Hyper Text Markup Language

Përmbajtja

- HTML5 New Features
- HTML5 Canvas
- HTML5 SVG
- HTML5 Drag/Drop
- HTML5 Video/Audio
- HTML5 Form Elements/Attributes
- HTML5 Semantic/Web Storage/App Cache/Web Workers/SSE



What is HTML5?

- HTML5 is the new standard for HTML.
- HTML5 is designed to deliver almost everything you want to do online without requiring additional plugins. It does everything from animation to apps, music to movies, and can also be used to build complicated applications that run in your browser.
- The HTML 5 working group includes AOL, Apple, Google, IBM, Microsoft, Mozilla, Nokia, Opera, and hundreds of other vendors.
- HTML5 is still a work in progress. However, all major browsers support many of the new HTML5 elements and APIs.

What is HTML5?

- In HTML5 there is only one `<!doctype>` declaration, and it is very simple:

```
<!DOCTYPE html>
```

- A simple HTML5 document, with the minimum of required tags:

```
<!DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">
<title>Title of the document</title>
</head>

<body>
Content of the document.....
</body>

</html>
```

HTML5 – New Features

Some of the most interesting new features in HTML5:

- The <canvas> element for 2D drawing
- The <video> and <audio> elements for media playback
- Support for local storage
- New content-specific elements, like <article>, <footer>, <header>, <nav>, <section>
- New form controls, like calendar, date, time, email, url, search

Complete reference list of HTML5 tags/global attributes...

<http://www.w3schools.com/tags/default.asp>

HTML5 Canvas

- A canvas is a rectangular area on an HTML page, and it is specified with the `<canvas>` element.
- HTML5 `<canvas>` element is used to draw graphics, on the fly, via scripting (usually JavaScript).
- It is only a container for graphics. You must use a script to actually draw the graphics.
- The markup looks like this:

```
<canvas id="myCanvas" width="200" height="100"></canvas>
```

Note: Always specify an id attribute (to be referred to in a script), and a width and height attribute to define the size of the canvas.

Ushtrimi > (Canvas - Det 1).

HTML5 Canvas (2)

- **Canvas Coordinates**

2 dimensional grid, where the upper-left corner has the coordinate (0,0)

- **Canvas - Paths**

To draw straight lines we will use the following two methods: `moveTo(x,y)`, `lineTo(x,y)`. (Canvas - Det 2)

To draw a circle on a canvas, we will use the following method: `arc(x,y,r,start,stop)` (Canvas – Det 3)

- **Canvas – Text**

the most important property and methods are:

`font` - defines the font properties for text

`fillText(text,x,y)` - Draws "filled" text on the canvas
(Canvas – Det 4)

`strokeText(text,x,y)` - Draws text on the canvas (no fill)
(Canvas – Det 5)

HTML5 Canvas (3)

- **Canvas – Gradients**

two different types of gradients:

`createLinearGradient(x,y,x1,y1)`

`createRadialGradient(x,y,r,x1,y1,r1)` (Canvas – Det 6)

- **Canvas - Images**

To draw an image on a canvas, we will use the following method: `drawImage(image,x,y)` (Canvas – Det 7)

HTML SVG (Scalable Vector Graphics)

- SVG is used to define vector-based graphics for the Web
- SVG defines the graphics in XML format
- SVG graphics do NOT lose any quality if they are zoomed or resized
- Every element and every attribute in SVG files can be animated

Differences Between SVG and Canvas

- SVG is a language for describing 2D graphics in XML.
- Canvas draws 2D graphics, on the fly (with a JavaScript).
- In SVG, each drawn shape is remembered as an **object**. If attributes of an SVG object are changed, the browser can automatically re-render the shape.

HTML SVG (2)

- In HTML5, you can embed SVG elements directly into your HTML page:
- Use SVG tag.

```
<html>
<body>

<svg width="300" height="200">
  <polygon points="100,10 40,180 190,60 10,60 160,180"
    style="fill:lime;stroke:purple;stroke-width:5;fill-rule:evenodd;" />
</svg>

</body>
</html>
```

HTML Drag and Drop

- In HTML5, drag and drop is part of the standard, and any element can be draggable.
- To make an element draggable, set the draggable attribute to true:

```
<img draggable="true">
```
- Specify what should happen when element is Dragged
 - *ondragstart* attribute specifies what function to call when an element is dragged.
 - *dataTransfer.setData* set the data type and the id of the dragged data (element).
- Specify where the data can be dropped
 - ondragover* event specifies where the dragged data can be dropped.
- Finally, drop the element.
 - ondrop* attribute specifies what function to call when the data is dropped.

HTML Video

- Until now, there has not been a standard for showing a video/movie on a web page.
- HTML5 defines a new element which specifies a standard way to embed a video/movie on a web page: the <video> element.

To show a video in HTML5, all you need is:

```
<video width="320" height="240" controls>  
  <source src="movie.mp4" type="video/mp4">  
  <source src="movie.ogv" type="video/ogg">  
Your browser does not support the video tag.  
</video>
```

HTML Video

- Video Formats and Browser Support

Browser	MP4	WebM	Ogg
Internet Explorer	YES	NO	NO
Chrome	YES	YES	YES
Firefox	NO Update: Firefox 21 running on Windows 7, Windows 8, Windows Vista, and Android now supports MP4	YES	YES
Safari	YES	NO	NO
Opera	NO	YES	YES

- Create simple play/pause + resize controls for a video:
- Ushtrime> [Video.html](#)

HTML Audio

- Until now there has not been a standard for playing audio files on a web page.
- HTML5 defines a new element which specifies a standard way to embed an audio file on a web page: the `<audio>` element.

To play an audio in HTML5, all you need is:

```
<audio controls>  
  <source src="horse.ogg" type="audio/ogg">  
  <source src="horse.mp3" type="audio/mpeg">  
  Your browser does not support the audio element.  
</audio>
```

HTML Audio

- Audio Formats and Browser Support

Browser	MP3	Wav	Ogg
Internet Explorer	YES	NO	NO
Chrome	YES	YES	YES
Firefox	NO Update: Firefox 21 running on Windows 7, Windows 8, Windows Vista, and Android now supports MP3	YES	YES
Safari	YES	YES	NO
Opera	NO	YES	YES

- Create an audio control:
- Ushtrime> [Audio.html](#)

HTML5 Input Types

- HTML5 has several new input types for forms. These new features allow better input control and validation.

Some of them are:

- color
- date
- datetime
- datetime-local
- email
- month
- number
- range
- search
- tel
- time
- url
- week

HTML5 Form Elements

- HTML5 has the following new form elements:

`<datalist>`, `<keygen>`, `<output>`

The `<datalist>` element specifies a list of pre-defined options for an `<input>` element.

The `<datalist>` element is used to provide an "autocomplete" feature on `<input>` elements. Users will see a drop-down list of pre-defined options as they input data.

(Ushtrime> New Form Element - Detyra 1)

The `<keygen>` element is to provide a secure way to authenticate users.

The `<keygen>` tag specifies a key-pair generator field in a form. The private key is stored locally, and the public key is sent to the server.

When the form is submitted, two keys are generated, one private and one public. The public key could be used to generate a client certificate to authenticate the user in the future.

The `<output>` element represents the result of a calculation (like one performed by a script). *(Ushtrime> New Form Element – Detyra 2)*

HTML5 New Form Attributes

New attributes for <form>:

-autocomplete (*Ushtrime*> *8- New Form Attribute - Detyra 1*)

-novalidate (*Ushtrime*> *8- New Form Attribute - Detyra 2*)

New attributes for <input>:

autocomplete

autofocus

formmethod

form

formaction

formenctype

formnovalidate

formtarget

height and width

list

min and max

multiple

pattern (regexp)

placeholder

required

Step

(*Ushtrime*> *W3Schools*)

HTML Semantics (2)

Tag	Description
<code><article></code>	Defines an article
<code><aside></code>	Defines content aside from the page content
<code><figcaption></code>	Defines a caption for a <code><figure></code> element
<code><figure></code>	Specifies self-contained content, like illustrations, diagrams, photos, code listings, etc.
<code><footer></code>	Defines a footer for a document or section
<code><header></code>	Specifies a header for a document or section
<code><mark></code>	Defines marked/highlighted text
<code><nav></code>	Defines navigation links
<code><section></code>	Defines a section in a document
<code><time></code>	Defines a date/time

HTML5 +

- Web Storage
- App Cache
- Web Workers
- SSE

HTML5 + (2)

What is HTML5 Web Storage?

- With HTML5, web pages can store data locally within the user's browser.
- Earlier, this was done with cookies. However, Web Storage is more secure and faster. The data is not included with every server request, but used ONLY when asked for. It is also possible to store large amounts of data, without affecting the website's performance.
- The data is stored in key/value pairs, and a web page can only access data stored by itself.

HTML5 + (3)

localStorage and sessionStorage

- There are two new objects for storing data on the client:

localStorage - stores data with no expiration date

sessionStorage - stores data for one session

HTML5 + (4)

The localStorage Object

- The localStorage object stores the data with no expiration date. The data will not be deleted when the browser is closed, and will be available the next day, week, or year.

Example

```
localStorage.lastname="Smith";  
document.getElementById("result").innerHTML="Last name: "  
+ localStorage.lastname;
```

Example explained:

Create a localStorage key/value pair with key="lastname" and value="Smith"

Retrieve the value of the "lastname" key and insert it into the element with id="result"

HTML5 + (5)

The sessionStorage Object

- The sessionStorage object is equal to the localStorage object, **except** that it stores the data for only one session. The data is deleted when the user closes the browser window.

Example

```
if (sessionStorage.clickcount)
{
    sessionStorage.clickcount=Number(sessionStorage.clickcount)+1;
}
else
{
    sessionStorage.clickcount=1;
}
document.getElementById("result").innerHTML="You have clicked the
button " + sessionStorage.clickcount + " time(s) in this session.";
```

HTML5 + (6)

What is Application Cache?

- HTML5 introduces application cache, which means that a web application is cached, and accessible without an internet connection.
- Application cache gives an application three advantages:
 - Offline browsing - users can use the application when they're offline
 - Speed - cached resources load faster
 - Reduced server load - the browser will only download updated/changed resources from the server

HTML5 + (7)

What is Application Cache?

- The example below shows an HTML document with a cache manifest (for offline browsing):

Example

```
<!DOCTYPE HTML>
```

```
<html manifest="demo.appcache">
```

```
<body>
```

```
The content of the document.....
```

```
</body>
```

```
</html>
```

CACHE MANIFEST

/theme.css

/logo.gif

/main.js

HTML5 + (8)

What is a Web Worker?

- When executing scripts in an HTML page, the page becomes unresponsive until the script is finished.
- A web worker is a JavaScript that runs in the background, independently of other scripts, without affecting the performance of the page. You can continue to do whatever you want: clicking, selecting things, etc., while the web worker runs in the background.

Server-Sent Events - One Way Messaging

- A server-sent event is when a web page automatically gets updates from a server.
- This was also possible before, but the web page would have to ask if any updates were available. With server-sent events, the updates come automatically.
- Examples: Facebook/Twitter updates, stock price updates, news feeds, sport results, etc.