HTML5 & CSS3

A chance to Do things Differently

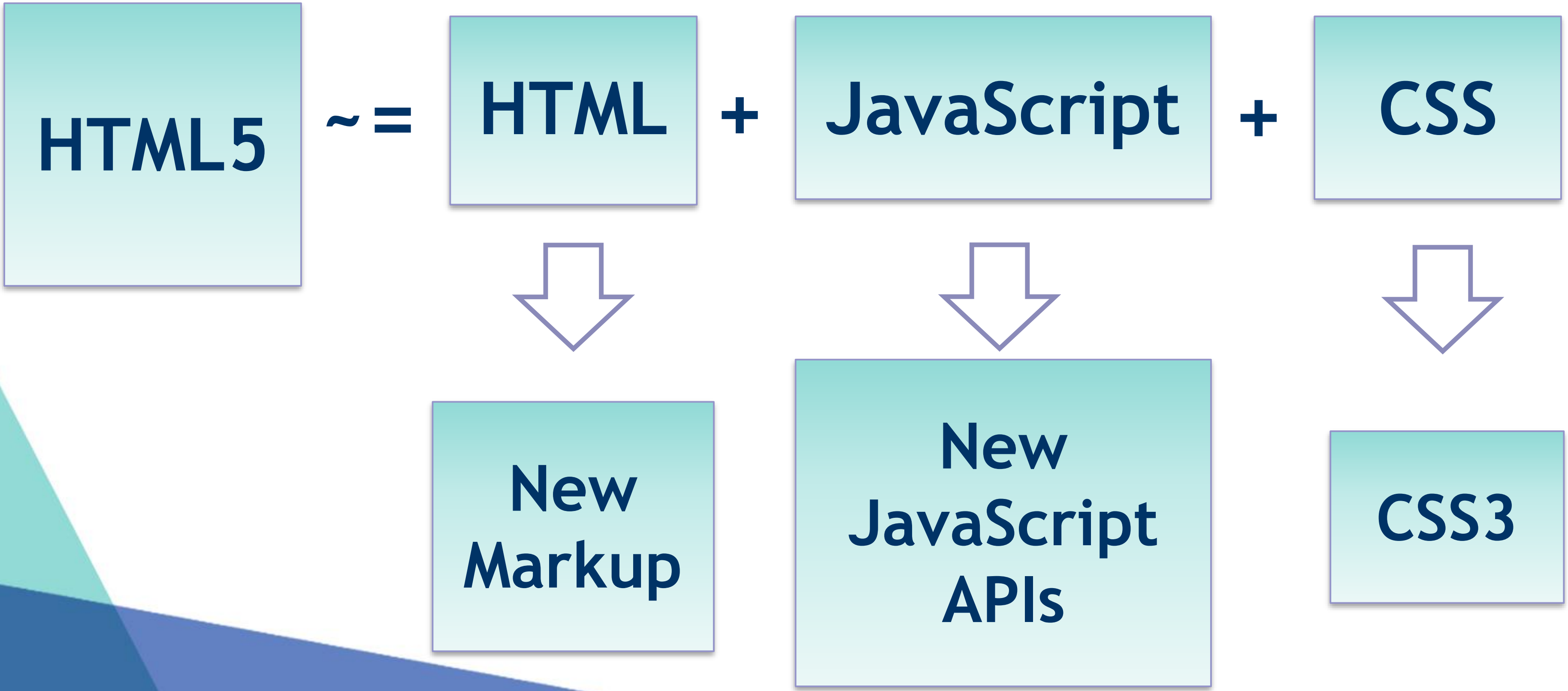
Eng. Niveen Nasr El-Den

iTi

Day 1

What is HTML5

HTML5 is a Constellation of technology



HTML5 ~= HTML + JavaScript + CSS

New Markup

New JavaScript APIs

CSS3

HTML5

A Record of Tomorrow

Overview of Enhancements

- Structure and Semantics
- Forms
- Microdata
- CSS
- Embedded Content and Multimedia
- DOM APIs drag and drop
- Web Storage
- Web worker
- …

HTML5
includes new elements for
better structure,
better form handling,
drawing, and
media content

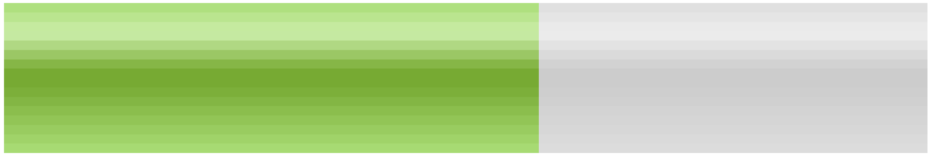
New Elements

<meter>

- Representing scalar measurements or fractional values
- Meter is also known as a gauge
- It should not be used to indicate progress
- Attributes:
  - **value**
  - **min**
  - **max**
  - **high**
  - **low**
  - **optimum**

Using <meter>

```
<meter value="0.6“
               min=“”
               max=“”
               optimum =" “
               low=" “
               high ="0.6“ >
               Medium
</meter>
```



https://css-tricks.com/html5-meter-element/

<progress>

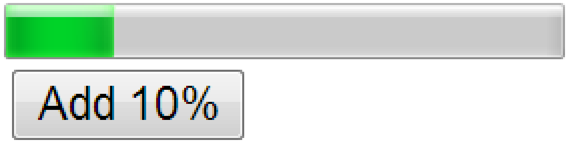
- Show completion progress of a task
- Progress bars are widely used in other applications
- Works with scripted applications

- Attributes
  - value : Specifies how much of the task has been completed
  - max : Specifies how much work the task requires in total

- Useful for:
  - Indicate loading progress of an AJAX application
  - Show user progress through a series of forms
  - Making impatient users wait

Using <progress>

```
<progress max=“20”>
        Step 3 of 6
</progress>
```



```
<progress value="0.5“ >
  Half way!
</progress>
```

```
<progress id=“pBar" max="100" value="0">
  Nothing...
</progress>
```

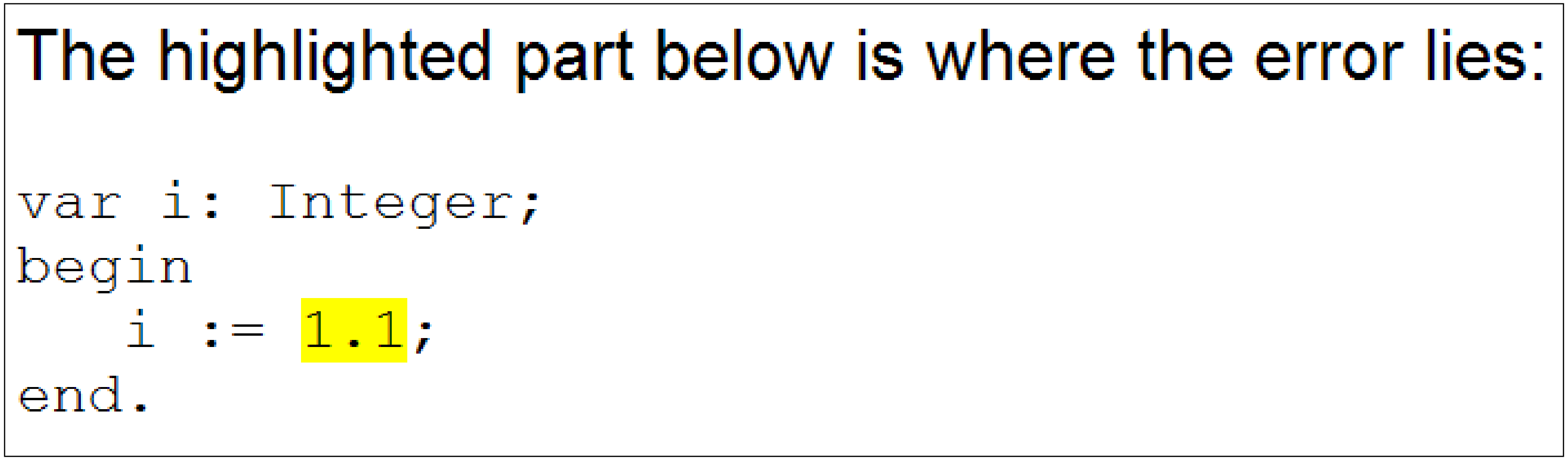
<mark>

- Marked or Highlighted text

- Indicates point of interest or relevance

- Useful for:
  - Highlighting relevant code in a code sample
  - Highlighting search keywords in a document

Using <mark>



The highlighted part below is where the error lies:

```
var i: Integer;
begin
   i := 1.1;
end.
```

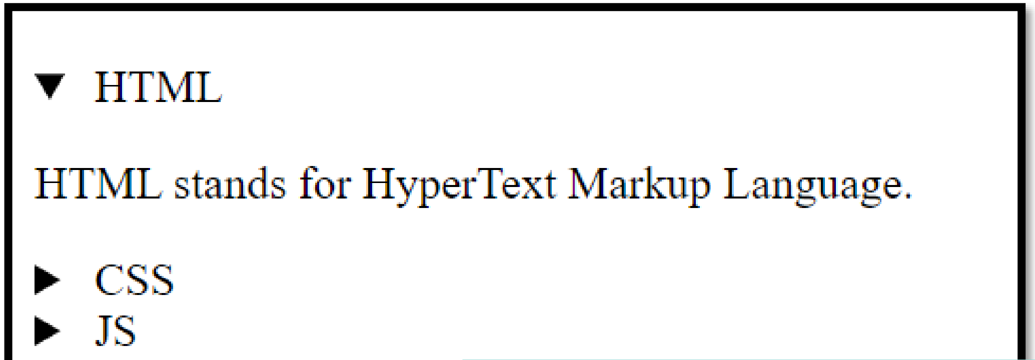
```
<p>The highlighted part below is
   where the error lies:</p>
<pre><code>var<var> i</var>: Integer;
begin
   i := <mark>1.1</mark>;
end.</code></pre>
```

is used for computer code

is used to indicate a variable within code.

Using <details> & <summary>

is used for additional details which can be hidden or revealed.



▼ HTML

HTML stands for HyperText Markup Language.

▶ CSS
▶ JS

Note:
details has "toggle“ event and “open” property set to true when it is opened

```
<details>
   <summary> HTML </summary>
   <p>HyperText Markup Language.</p>
</details>
```

is used in conjunction with the <details> tag for specifying a summary.

Forms

Other Form's Controls

- HTML 4 controls are too limited
- Several new types added
- New Input type:

http://www.coreservlets.com/html5-tutorial/input-types.html

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

https://www.wufoo.com/html5/

Other Form's Controls

- <input type="tel">
- <input type="time">
- <input type="color">
- <input type="month">
- <input type="search">
- <input type="number">

- <input type="email">
- <input type="range">
- <input type="date">
- <input type="time">
- <input type="url">
- …

Other Form’s Controls

```
<form oninput="res.value =
                   parseInt(p1.value)+parseInt(p2.value)" >
    <input type="" id="p1">
    <input type="" id="p2">
    <output name="res" for="p1 p2">
</form>
```

is a container used to inject the results of an output calculation due to user action

Note:
The <output> "value", "name" attributes, and "content" are not sent during form submission

Other Form’s Controls

```
<input type="" list="d1">
<datalist id="d1">
    <option label="item#1" value="n1"></option>
    <option value="v1">item</option>
    <option value="n2"></option>
    <option value="n3"></option>
</datalist>
```

https://developer.mozilla.org/en-US/docs/Web/HTML/Element/datalist

<datalist> vs <select>

- <datalist> is used for suggesting the possible values from the large array of values relevant to that text filed.

- <select> won’t allow users to have privilege to input their own value.

Form Validation

New attributes
to describe validity constraints
for the expected input
required,
pattern,
min, max etc.

Form’s new Attributes

- <input type=“” required>
  - ▻ Required: We also have required attribute to mark this field as mandatory.
- <input type=“” autocomplete="off">
  - ▻ Autocomplete: tells the browser whether or not the value of this input should be saved for future, should be used to protect sensitive user data
- <input type=“” pattern=“[0-9][A-Z]{3}”>
  - ▻ Pattern: custom validate, A part number is a digit followed by three uppercase letters.
- input type=“” placeholder=“”>
  - ▻ Placeholder: add a hint inside the text-field, but where the hint automatically disappears when clicking inside it.

Form Validation

- We can present Form Validation using
  - ▻ JavaScript Custom Validation
  - ▻ HTML Built-in Form Validation
  - ▻ CSS rule Validation

Semantics & Structured Data

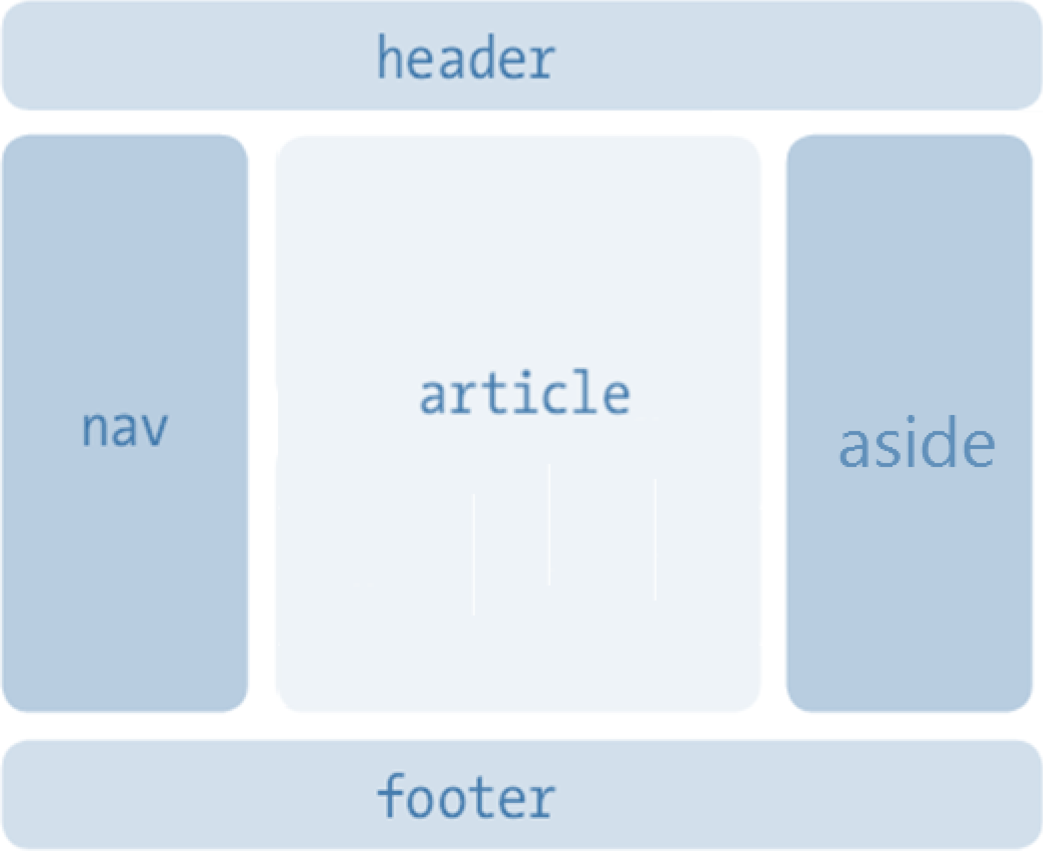
Semantic HTML

- Semantic HTML is the idea of using HTML elements for what they are rather than how they may appear in the browser by default.
- It is HTML that introduces meaning to the web page rather than just presentation.
- Semantic tags make it clear to the browser what the meaning of a page and its content is.

Elements clearly describes its meaning to both browser & developer

New Semantic Elements

- Markups that describe its content without presenting it e.g.
  - ▻ <header>
  - ▻ <hgroup>
  - ▻ <nav>
  - ▻ <section>
  - ▻ <article>
  - ▻ <aside>
  - ▻ <footer>
  - ▻ etc.



Structured Data

- Structured data is a standardized format for providing information about a page and classifying the page content

- It helps understanding more about the web page and show better headline text, images etc..

https://developers.google.com/search/docs/guides/intro-structured-data?visit_id=636758461413700902-4066872858&rd=1

- Search engines use structured data to
  - ▻ understand the content of the page
  - ▻ gather information about the web and the world in general.
  - ▻ enable special search result features and enhancements like appear in a graphical search result.

Structured Data Supported formats

- JSON-LD (https://json-ld.org/)
  - ▻ JavaScript Object Notation for Linked Data
  - ▻ JSON-LD uses a JavaScript object in your HTML page to define data.
  - ▻ JavaScript notation embedded in a <script> tag in the page head or body.
- Microdata
  - ▻ Microdata uses HTML tags and attributes to define data like RDFa.
  - ▻ It nests the structured data within HTML content
  - ▻ It is typically used in the page body, but can be used in the head.
- RDFa (http://rdfa.info/)
  - ▻ Resource Description Framework in Attributes
  - ▻ Commonly used in both the head and body sections of the HTML page.

https://developers.google.com/search/docs/guides/sd-policies

https://developer.mozilla.org/en-US/docs/Web/HTML/Microdata

Microdata

- Microdata a new lightweight semantic meta-syntax.

https://www.w3.org/TR/microdata/

- Microdata defines five HTML attributes that can be applied to any HTML5 tag.

- It helps search engines and other applications better understand our content and display it in a useful, relevant way.

- It gives us a whole new way to *add extra semantic information and extend HTML5*.

- It provides a meaning of an Item.

Microdata

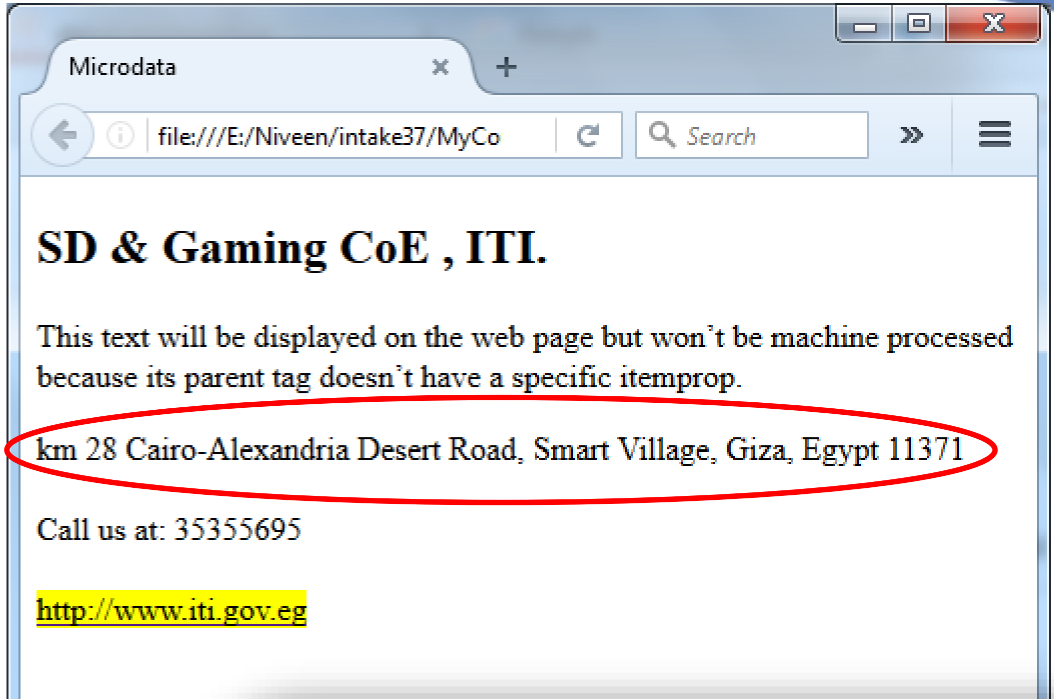
- Instead of elements, these name-value pairs are defined via attributes:
  - **itemscope**
    - Indicates the element is a microdata element and its child elements are part of its microdata format.
  - **itemprop**="property-name"
    - An individual data element that adds a *property* to a microdata item
  - **itemtype="**URL"
    - Defines the vocabulary to be used by the microdata format.

http://schema.org/docs/gs.html

~~http://data-vocabulary.org/~~

Schema.org

(often called Schema) is a semantic vocabulary of tags (or microdata) that you can add to your HTML to improve the way search engines read and represent your page in SERPs



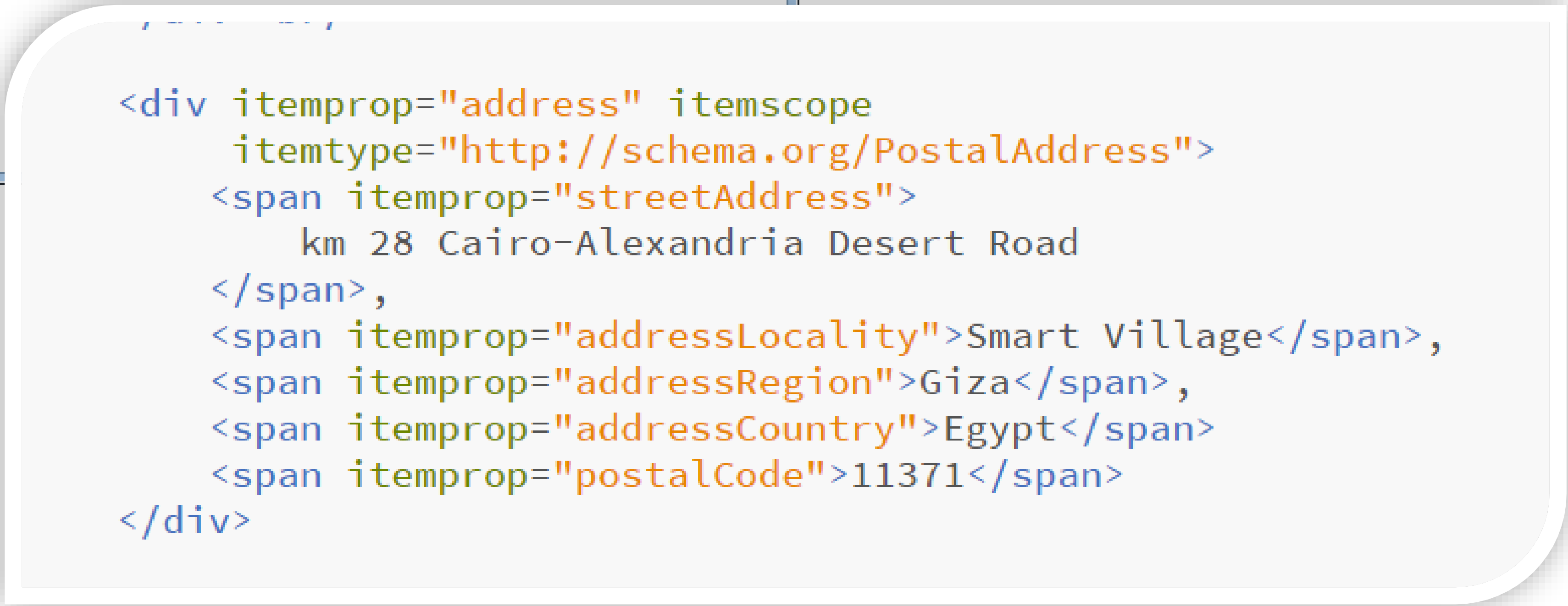
SD & Gaming CoE , ITI.

This text will be displayed on the web page but won't be machine processed because its parent tag doesn't have a specific itemprop.

km 28 Cairo-Alexandria Desert Road, Smart Village, Giza, Egypt 11371

Call us at: 35355695

http://www.iti.gov.eg



```
<div itemprop="address" itemscope
     itemtype="http://schema.org/PostalAddress">
    <span itemprop="streetAddress">
        km 28 Cairo-Alexandria Desert Road
    </span>,
    <span itemprop="addressLocality">Smart Village</span>,
    <span itemprop="addressRegion">Giza</span>,
    <span itemprop="addressCountry">Egypt</span>
    <span itemprop="postalCode">11371</span>
</div>
```

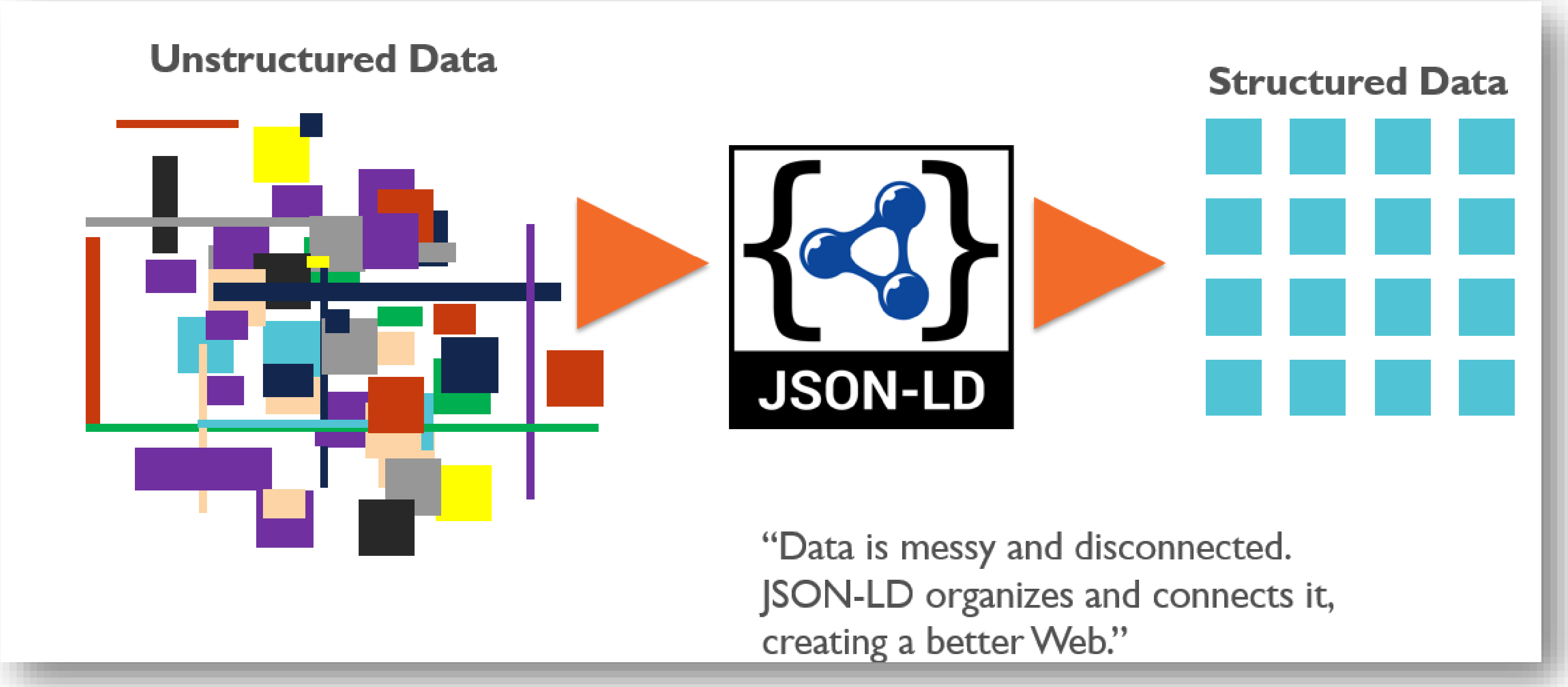
Developers can test pages containing Microdata using any Structured Data Testing Tool

http://linter.structured-data.org/

Chrome Structured Data Tool Extension

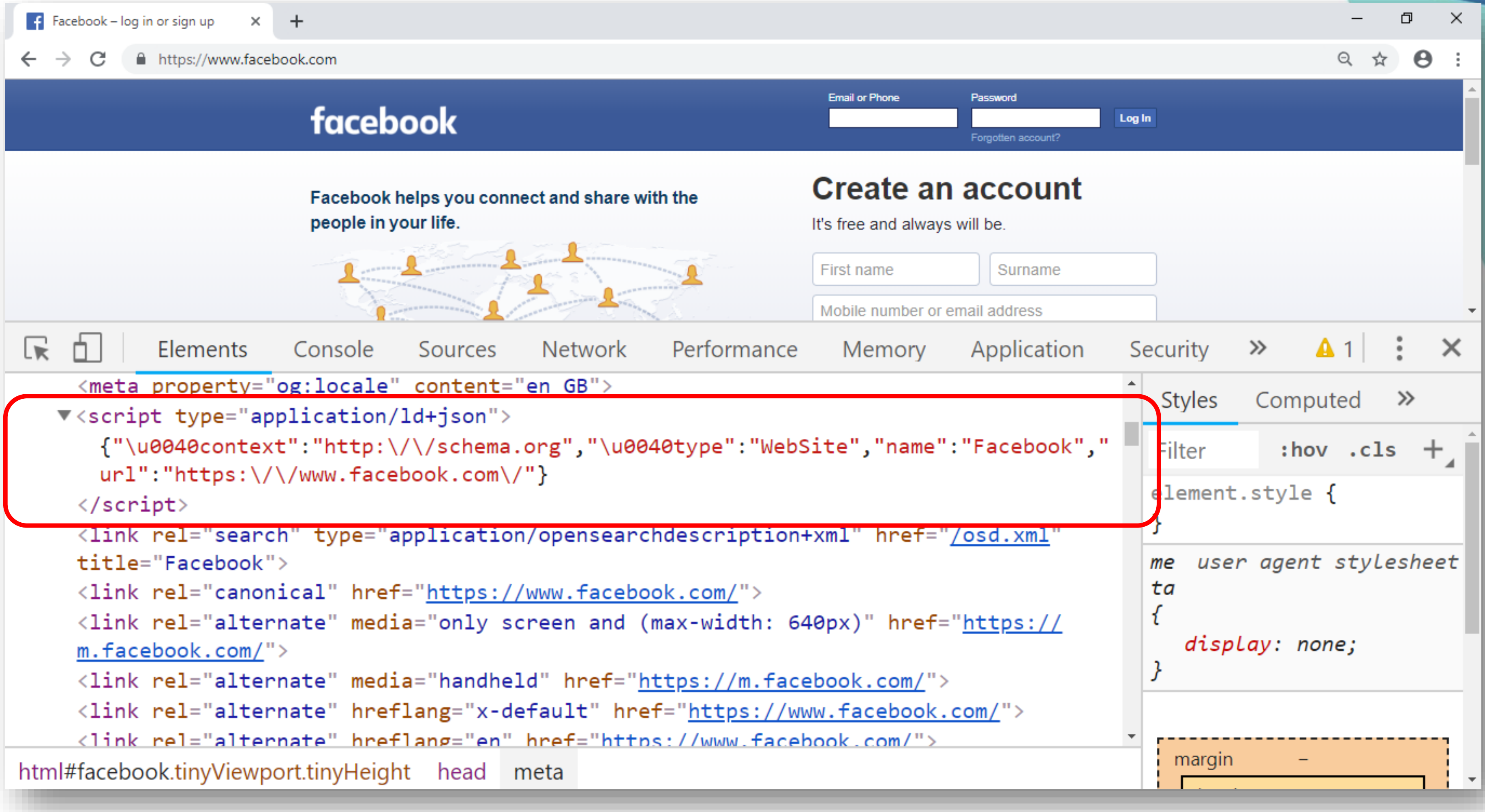
https://search.google.com/structured-data/testing-tool

JSON-LD



“Data is messy and disconnected. JSON-LD organizes and connects it, creating a better Web.”

https://moz.com/blog/json-ld-for-beginners



Facebook helps you connect and share with the people in your life.

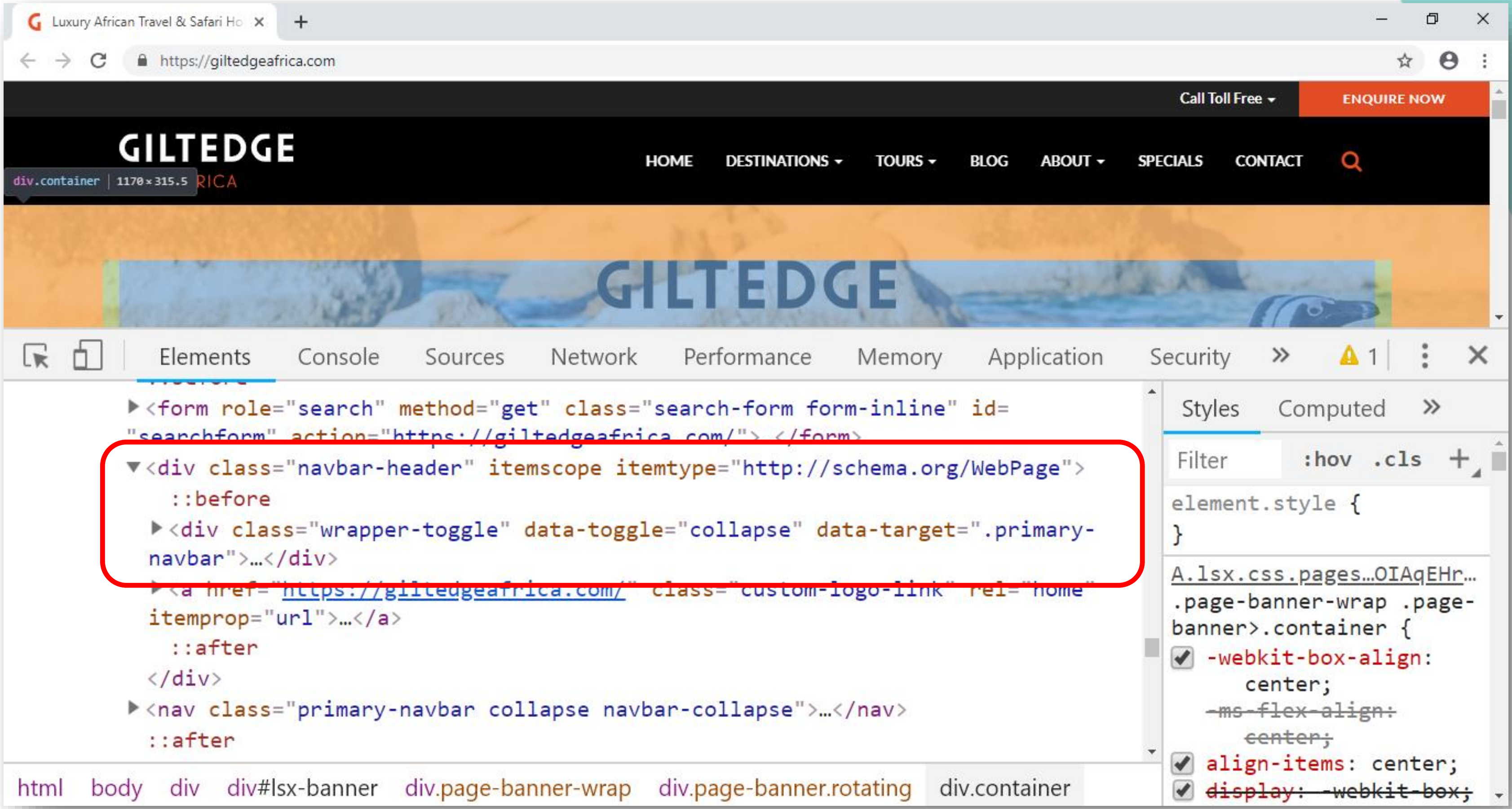
Create an account

It's free and always will be.

```
    <meta property="og:locale" content="en_GB">
  ▼<script type="application/ld+json">
      {"\u0040context":"http:\/\/schema.org","\u0040type":"WebSite","name":"Facebook","
      url":"https:\/\/www.facebook.com\/"}
    </script>
    <link rel="search" type="application/opensearchdescription+xml" href="/osd.xml"
    title="Facebook">
    <link rel="canonical" href="https://www.facebook.com/">
    <link rel="alternate" media="only screen and (max-width: 640px)" href="https://
    m.facebook.com/">
    <link rel="alternate" media="handheld" href="https://m.facebook.com/">
    <link rel="alternate" hreflang="x-default" href="https://www.facebook.com/">
    <link rel="alternate" hreflang="en" href="https://www.facebook.com/">
```

```
element.style {
}
me   user agent stylesheet
ta
{
   display: none;
}
```

https://w3techs.com/technologies/details/da-jsonld/all/all



```
▶<form role="search" method="get" class="search-form form-inline" id=
"searchform" action="https://giltedgeafrica.com/">…</form>
▼<div class="navbar-header" itemscope itemtype="http://schema.org/WebPage">
   ::before
  ▶<div class="wrapper-toggle" data-toggle="collapse" data-target=".primary-
  navbar">…</div>
  ▶<a href="https://giltedgeafrica.com/" class="custom-logo-link" rel="home"
  itemprop="url">…</a>
   ::after
  </div>
▶<nav class="primary-navbar collapse navbar-collapse">…</nav>
  ::after
```

```
element.style {
}
A.lsx.css.pages…OIAqEHr…
.page-banner-wrap .page-
banner>.container {
☑ -webkit-box-align:
      center;
  ~~-ms-flex-align:~~
      ~~center;~~
☑ align-items: center;
☑ ~~display: -webkit-box;~~
```

https://github.com/lawrencewoodman
/mida/wiki/Sites-Using-Microdata

Web designers and site owners use search engine optimization (SEO) methods to make their sites & pages appear at or near the top of a SERP.

HTML5 data Attributes

- Store some extra information that doesn’t have any visual representation.

- The name of a custom data attribute begins with data-* , and must be at least one character long after this prefix.

- The attribute value can be any string that contains only [a-z], [0-9], (-), (.), (:), (_).

- It should not contain ASCII capital letters (A to Z).

Embedded Content & Multimedia

Multimedia

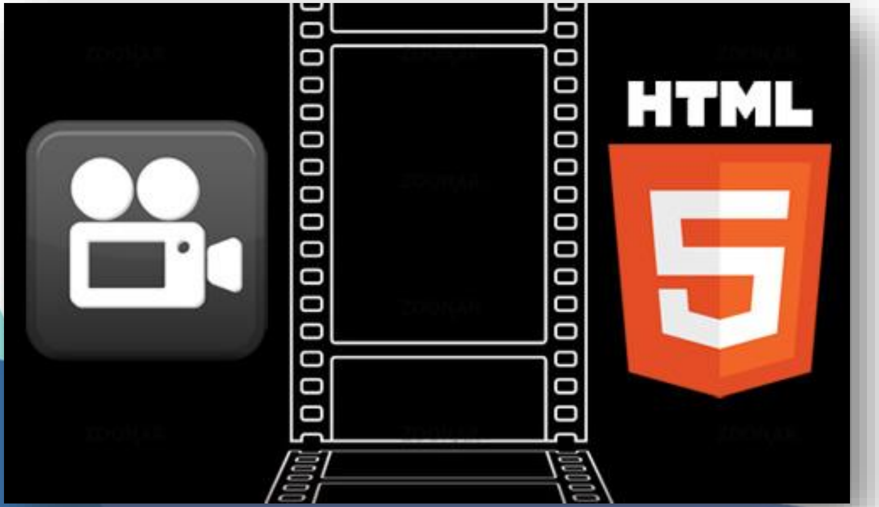
No need for plugin to play video and audio

HTML 5 will do it for you

Video & Audio

- HTML5 offers the ability to easily embed media into HTML documents.

- Media playback can be controlled via JavaScript and media events.



- Nothing to install.
- Works in all browsers and phones (adding native support to browsers).

Native Media format for HTML5

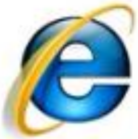
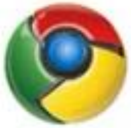
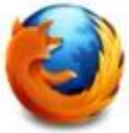
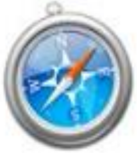
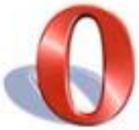
- Video
  - ▻ webM
  - ▻ H.264(mp4)
  - ▻ oggTheora

- Audio
  - ▻ wav
  - ▻ mp3
  - ▻ oogVorbis

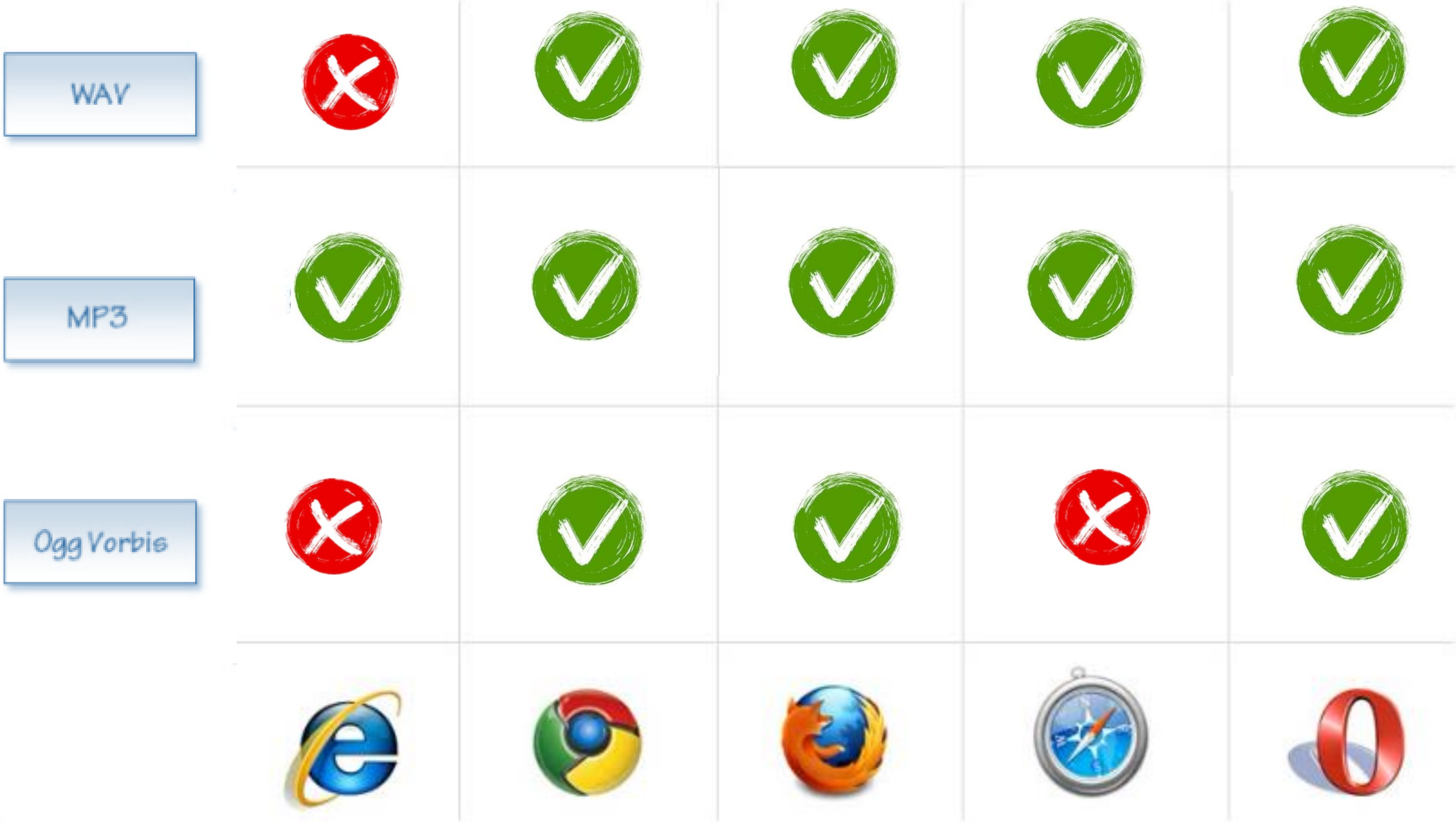
- No common format to use.
- We have to encode in different multiple formats.
- Need of converter to convert into different format.

Native Video Browser Support

https://en.wikipedia.org/wiki/HTML5_video

VP8 (WebM)	✗	✓	✓	✓	✓
H.264(MP4)	✓	✓	✓	✓	✓
Ogg Theora	✗	✓	✓	✗	✓
					

Native Audio Browser Support



WAV	✗	✓	✓	✓	✓
MP3	✓	✓	✓	✓	✓
Ogg Vorbis	✗	✓	✓	✗	✓

Media Attributes

Attribute	Description
src	Specifies the URL of the **media** source file
controls	Specifies whether or not to display **media** controls (such as a play/pause button etc).
autoplay	Specifies whether or not to start playing the **media** as soon as it has been loaded. Depending on browser policy
loop	Specifies whether to keep re-playing the **media** once it has finished.
poster=“”	display a frame of the **video** (as a .jpg, .png..)
width=“”	Specifies the width, in pixels, to display the **video**.
height=“”	Specifies the height, in pixels, to display the **video.**

- NOTE:
  - HTML5 isn’t extension for XHTML
    - There is no need to have a value for each attribute, otherwise set its value either to true or its name

Media Methods & Properties

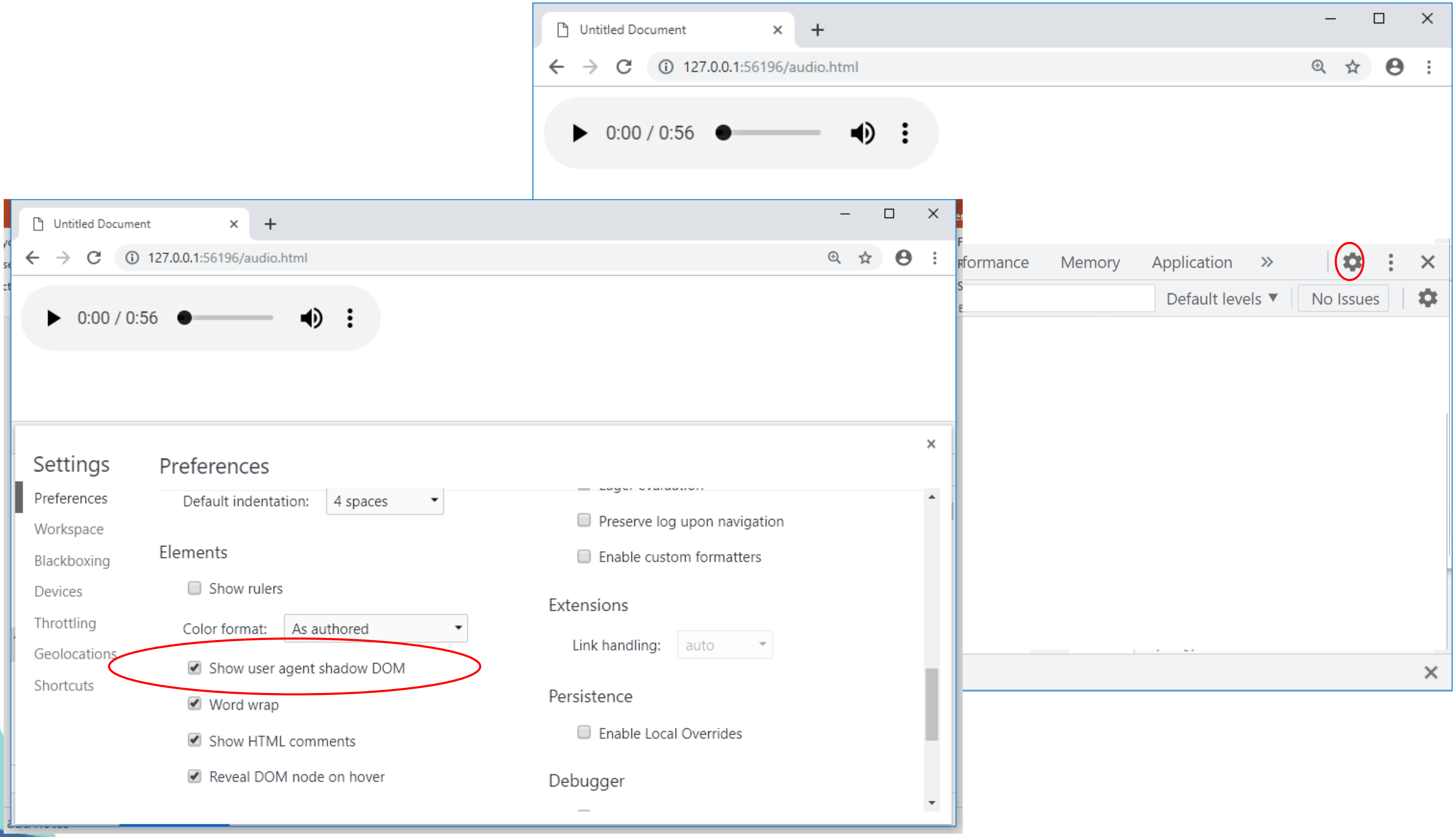
https://developer.mozilla.org/en/docs/Web/Guide/Events/Media_events

Method	Description
load()	Re-loads the audio/video element
play()	Starts playing the audio/video
pause()	Pauses the currently playing audio/video

- controls
- loop
- autoplay
- played
- paused
- ended

- playbackRate → range [0, 16]
- currentTime
- duration
- src
- muted
- volume → range [0, 1]

Shadow DOM Setting



Settings

- Preferences
- Workspace
- Blackboxing
- Devices
- Throttling
- Geolocations
- Shortcuts

Preferences

Default indentation: 4 spaces

Elements

☐ Show rulers

Color format: As authored

☑ Show user agent shadow DOM

☑ Word wrap

☑ Show HTML comments

☑ Reveal DOM node on hover

☐ Eager evaluation

☐ Preserve log upon navigation

☐ Enable custom formatters

Extensions

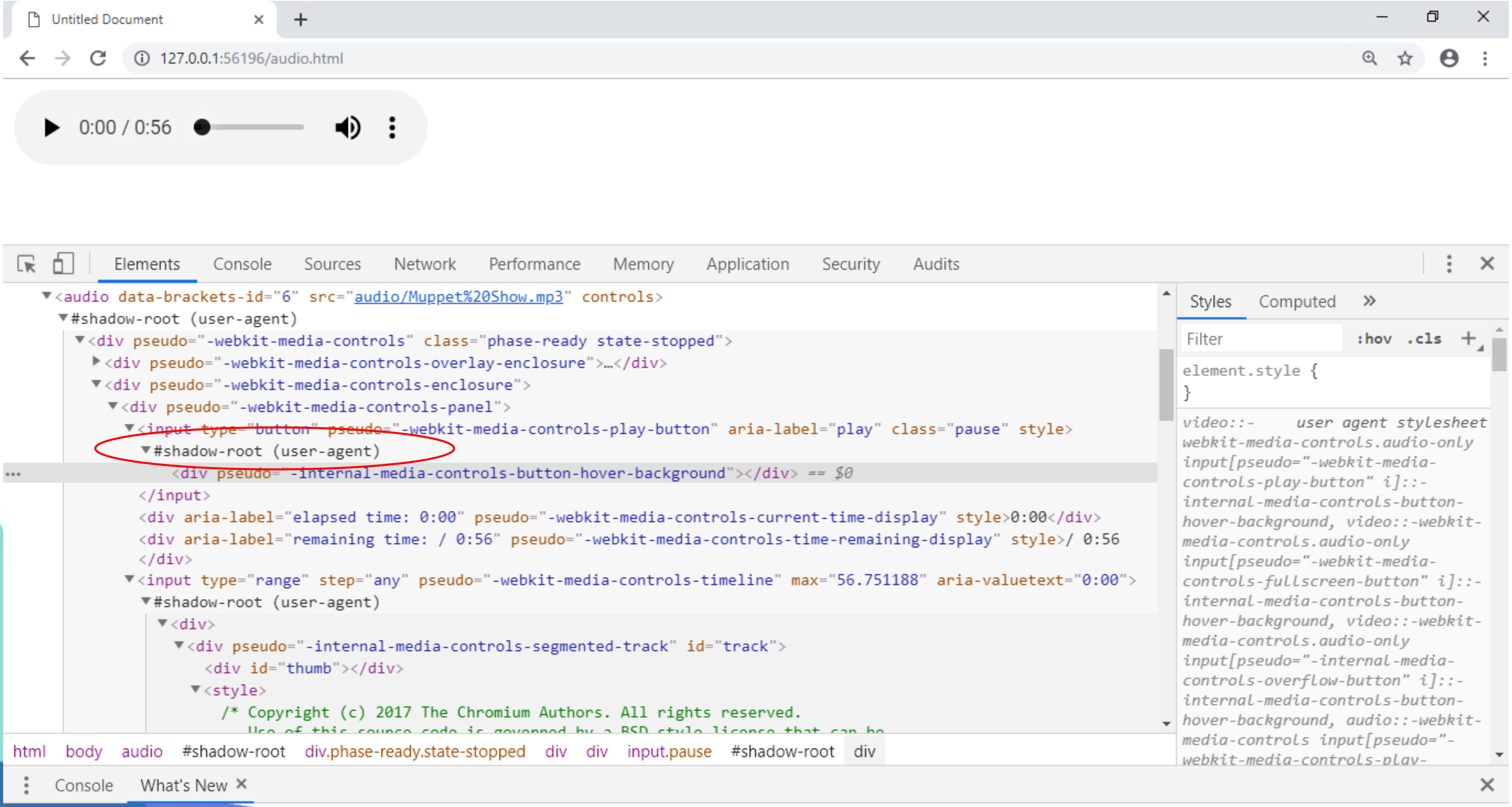
Link handling: auto

Persistence

☐ Enable Local Overrides

Debugger

Shadow DOM Example

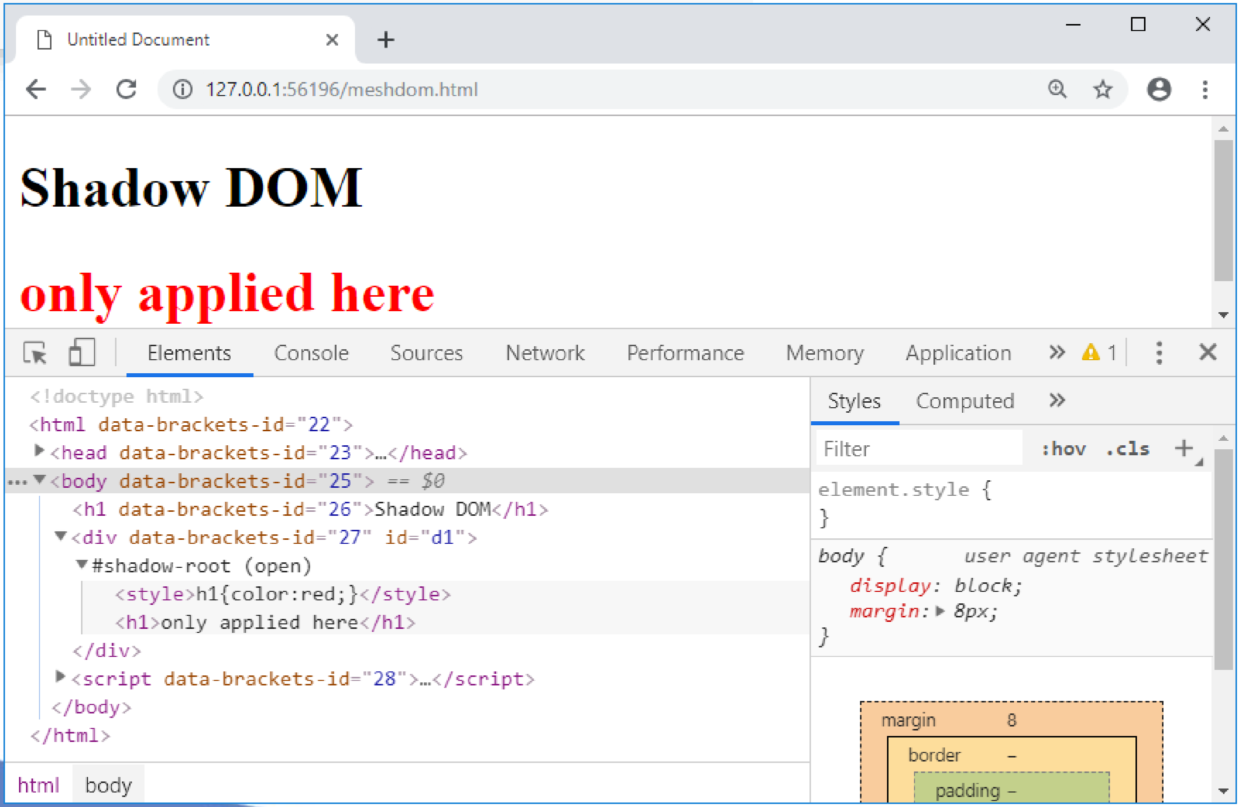


```
▼<audio data-brackets-id="6" src="audio/Muppet%20Show.mp3" controls>
  ▼#shadow-root (user-agent)
    ▼<div pseudo="-webkit-media-controls" class="phase-ready state-stopped">
      ▶<div pseudo="-webkit-media-controls-overlay-enclosure">…</div>
      ▼<div pseudo="-webkit-media-controls-enclosure">
        ▼<div pseudo="-webkit-media-controls-panel">
          ▼<input type="button" pseudo="-webkit-media-controls-play-button" aria-label="play" class="pause" style>
            ▼#shadow-root (user-agent)
...             <div pseudo="-internal-media-controls-button-hover-background"></div> == $0
            </input>
            <div aria-label="elapsed time: 0:00" pseudo="-webkit-media-controls-current-time-display" style>0:00</div>
            <div aria-label="remaining time: / 0:56" pseudo="-webkit-media-controls-time-remaining-display" style>/ 0:56
            </div>
          ▼<input type="range" step="any" pseudo="-webkit-media-controls-timeline" max="56.751188" aria-valuetext="0:00">
            ▼#shadow-root (user-agent)
              ▼<div>
                ▼<div pseudo="-internal-media-controls-segmented-track" id="track">
                    <div id="thumb"></div>
                  ▼<style>
                      /* Copyright (c) 2017 The Chromium Authors. All rights reserved.
                      Use of this source code is governed by a BSD-style license that can be
```

```
element.style {
}
video::-    user agent stylesheet
webkit-media-controls.audio-only
input[pseudo="-webkit-media-
controls-play-button" i]::-
internal-media-controls-button-
hover-background, video::-webkit-
media-controls.audio-only
input[pseudo="-webkit-media-
controls-fullscreen-button" i]::-
internal-media-controls-button-
hover-background, video::-webkit-
media-controls.audio-only
input[pseudo="-internal-media-
controls-overflow-button" i]::-
internal-media-controls-button-
hover-background, audio::-webkit-
media-controls input[pseudo="-
webkit-media-controls-play-
```

Shadow DOM Example

```
<h1>Shadow DOM</h1>
<div id="d1"></div>
<script>
    document.getElementById("d1").attachShadow({
        mode: 'open'// 'closed'
    }).innerHTML = "\
            <style>h1{color:red;}</style>\
            <h1 id='aaa'>only applied here</h1>"
</script>
```



Shadow DOM

only applied here

```
<!doctype html>
<html data-brackets-id="22">
 ▶<head data-brackets-id="23">…</head>
…▼<body data-brackets-id="25"> == $0
    <h1 data-brackets-id="26">Shadow DOM</h1>
   ▼<div data-brackets-id="27" id="d1">
     ▼#shadow-root (open)
        <style>h1{color:red;}</style>
        <h1>only applied here</h1>
    </div>
   ▶<script data-brackets-id="28">…</script>
  </body>
</html>
```

```
element.style {
}
body {           user agent stylesheet
  display: block;
  margin:▶ 8px;
}
```

Assignment