HTML Tutorial

Hans-Petter Halvorsen
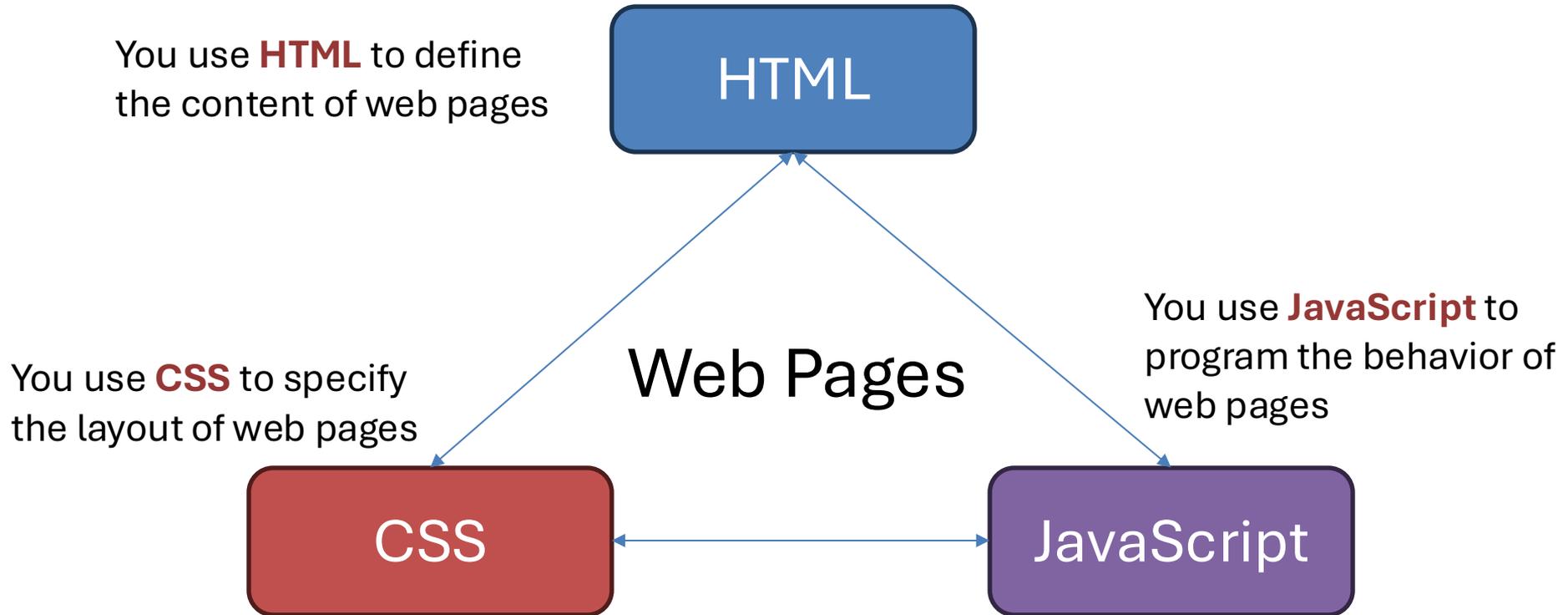
Contents

Introduction

Hans-Petter Halvorsen

History of Internet and Web

- **Internet** (1960s)
  - Made it possible to connect computers all over the world
- The first **PC:** 1981(IBM Personal Computer)
  - Everyone could afford it and do it from home
- **World Wide Web** - WWW (1990)
  - The foundation for todays web pages with hyperlinks
- The first **Web Browser** - Netscape, 1994
- **Google**, 1998
  - Made it possible to search through all web pages and find information
- Facebook, 2004
  - A totally new way of using Internet and communicate with others
- Smartphones (iPhone), 2007
  - Internet and and browse web pages in your pocket
- Tablets (iPad), 2010
  - A new way of surfing and read information on Internet from your sofa
- AI and ChatGPT, 2022
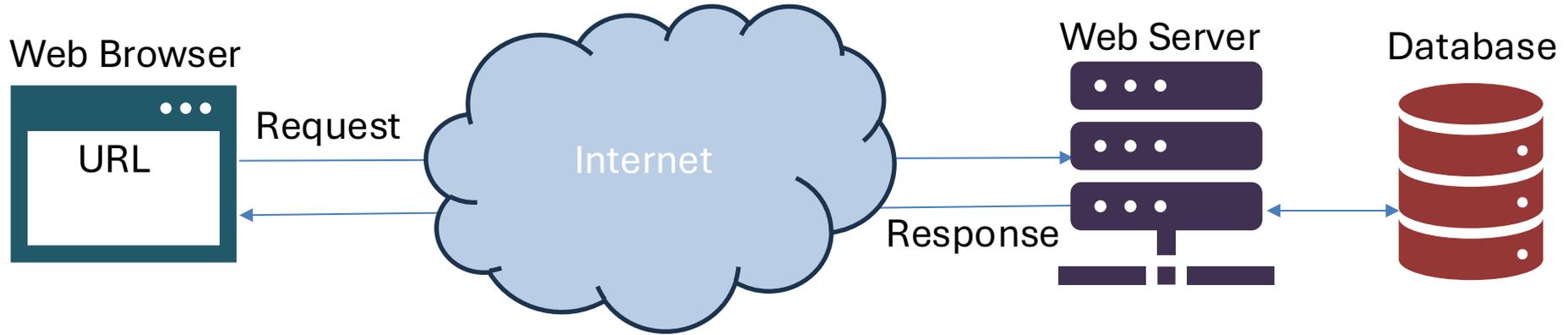 - Revolutionized the way of finding and creating information

Internet and WWW

- The Internet and the **World Wide Web (WWW)** are the foundation of today's web pages, websites and web applications.

- The Internet and the WWW (often just called the web) are often used interchangeably, but they are different: **the Internet is the infrastructure**, while the **WWW is a service that runs on this infrastructure**.

- The internet is a global network that connects billions of devices, including computers, smartphones, and other digital devices. The Internet was founded in the 60s. The internet uses the TCP/IP protocol to send data between these devices.

- The **WWW** is a service that uses the internet to view and surf between web pages. The WWW was invented around 1990 by Tim Berners-Lee and made it possible to navigate between web pages using so-called **hyperlinks**.

- The WWW mainly uses the Hypertext Transfer Protocol (**HTTP**) to transfer information between clients (such as web browsers) and servers (so-called web servers).

- The first **web browsers** also came in the 90s. The first commercial browser was Netscape Navigator, which was launched in December 1994. This browser played an important role in popularizing the internet and making it accessible to a wider audience. Internet Explorer from Microsoft came along with Windows 95. Internet Explorer quickly became one of the most widely used browsers in the 1990s and early 2000s.

- **HTML** is the "language" used in connection with web pages. HTML is used to structure the content of web pages. Invented by Tim Berners-Lee in 1991.

- **CSS** (Cascading Style sheet) is used to format and present (layout) the web pages.
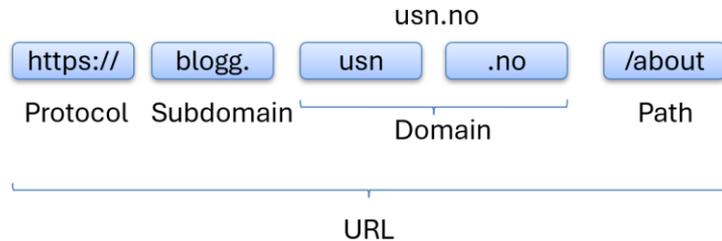
Web Programming Triangle

HTML

You use **HTML** to define the content of web pages

Web Pages

You use **JavaScript** to program the behavior of web pages

You use **CSS** to specify the layout of web pages

CSS

JavaScript

How Web Pages Work

Web Browser

URL

Request

Internet

Response

Web Server

Database

https://blogg.usn.no/about/

usn.no

https://	blogg.	usn	.no	/about
Protocol	Subdomain			Path

Domain

URL

HTML

Hans-Petter Halvorsen

HTML

- HTML is the main "language" used in connection with web pages.

- HTML is used to structure the content of web pages.

- HTML stands for **H**yper **T**ext **M**arkup **L**anguage.

- HTML elements tell the browser how to display the content.

HTML Page – Main structure

```
<!DOCTYPE html>
<html>

    <head>
        <title>Hello World</title>
    </head>

    <body>

        <h1>Welcome</h1>
        <p>Here you will learn about HTML.</p>

    </body>
</html>
```

An HTML web page has the extension **.html**

Hello World

The HTML code created in Visual Studio Code:
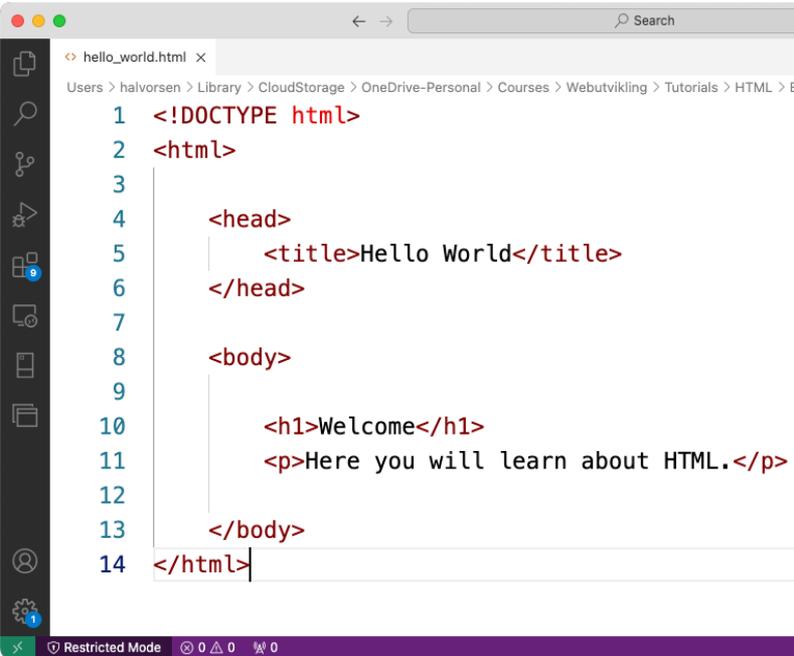

```html
<!DOCTYPE html>
<html>

    <head>
        <title>Hello World</title>
    </head>

    <body>

        <h1>Welcome</h1>
        <p>Here you will learn about HTML.</p>

    </body>
</html>
```

You can use any type of text editor since HTML is pure text.

The HTML page open in my local web browser:

## Welcome

Here you will learn about HTML.

Here, the HTML page is located on my PC and a just double-click to open the page in my default web browser.
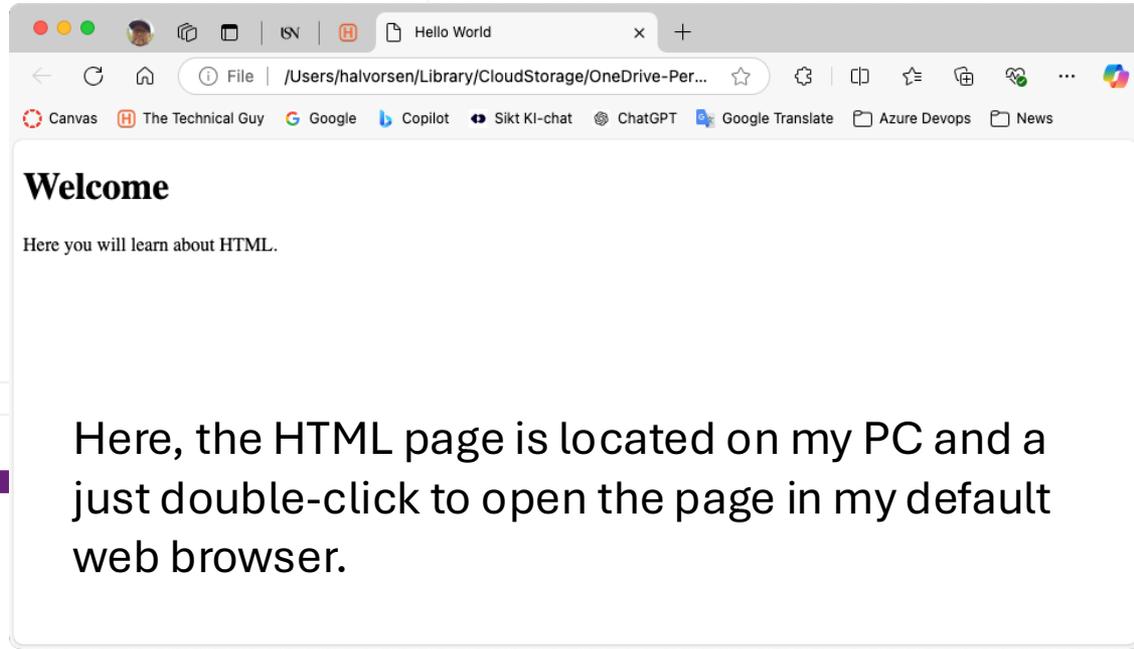
Upload File to Web Server

You typically need to upload the HTML file to a Web Server using an **FTP** program:

Then you enter the URL to the Web page in my web browser in order to open the HTML file:
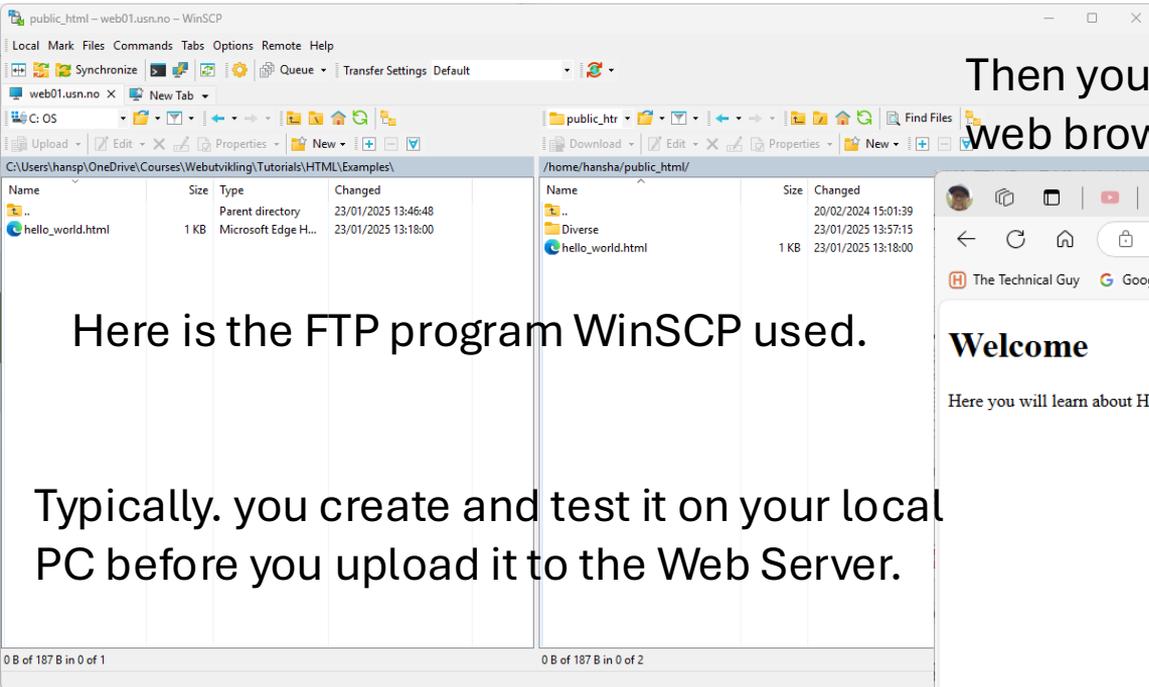
Here is the FTP program WinSCP used.

Typically. you create and test it on your local PC before you upload it to the Web Server.
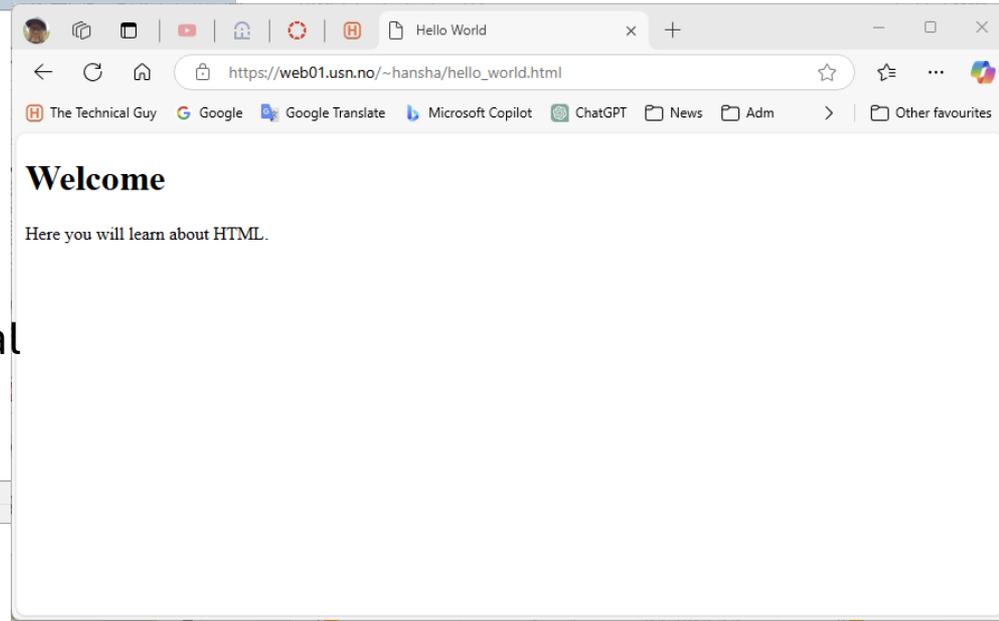
HTML Tags

In HTML we use so-called HTML tags, some of the most used tags are:

- **\<html\>**: The root element of an HTML document.
- **\<head\>**: Contains meta-information about the document, such as the title and links to stylesheets.
- **\<title\>**: Sets the title of the document, which appears in the browser's title bar.
- **\<body\>**: Contains the content of the HTML document that is visible to users.
- **\<h1\>** to \<h6\>: Define headings, with \<h1\> being the highest (or most important) level and \<h6\> the lowest.
- **\<p\>**: Defines a paragraph.
- **\<a\>**: Creates hyperlinks.
- **\<img\>**: Embeds images.
- \<ul\>, \<ol\>, and \<li\>: Create unordered lists, ordered lists, and list items, respectively.
- \<div\>: Defines a division or section in an HTML document.
- \<span\>: Used to group inline-elements in a document.
- \<strong\> and \<em\>: Define important and emphasized text, respectively.

Most of these tags has a start tag, like \<title\>: and an end tag like \</title\>.

HTML Tags Examples

Here you see some of the most used HTML Tags

Hyperlink:

```
<a href="http://www.google.com">This is a link to Google</a>
```

Bold Text:

```
<b>This is my Text</b>
```

Headers:

```
<h1>This is my Header</h1>
```

```
<h2>This is my Header</h2>
```

```
<h3>This is my Header</h3>
```

Title:

```
<title>This is my Title</title>
```

Image:

```
<img src="myimage.jpg" alt="blabla" width="104" height="142">
```

Paragraph:

```
<p>My first paragraph.</p>
```

Line Break:

```
This is my Text
<br>
This is also my Text
```

Comments:

```
<!-- Write your comments here -->
```

Headings <h1>, <h2>, ..


```
1   <!DOCTYPE html>
2   <html>
3
4       <head>
5           <title>Hello World</title>
6       </head>
7
8       <body>
9
10          <h1>Introduction</h1>
11          <p>Here you will learn about HTML.</p>
12
13          <h2>Background</h2>
14          <p>Here you will learn about the history
15
16          <h3>WWW</h3>
17          <p>The WWW is a service that uses the inte
18          The WWW was invented around 1990 by Tim Be
19              between web pages using so-called hyperl
20
21      </body>
22   </html>
```

Hello World

File | /Users/halvorsen/Library/CloudStorage/...

Canvas | The Technical Guy | Google | Copilot | Sikt KI-chat | ChatGPT | Google Translate

Introduction

Here you will learn about HTML.

Background

Here you will learn about the history of Internet and WWW.

WWW

The WWW is a service that uses the internet to view and surf between web pages. The WWW was invented around 1990 by Tim Berners-Lee and made it possible to navigate between web pages using so-called hyperlinks.

Typically, 3 levels are enough (<h1>, <h2> and <h3>)

CSS

CSS (Cascading Style sheet) is used to format and present (layout) the web pages.

So, in order to change the appearance, font type, font size, etc., we need to use CSS.

CSS

A recommended way to use CSS is to put all CSS styling and formatting into separate file and then link that document into the different HTML files. In that way you have all CSS in one place, and you can easily change the CSS for all your HTML files by only change it one place.

stylesheet.css:

```css
body {
    background-color: #d0e4fe;
}

h1 {

    color: orange;
    text-align: center;
}

p {

    font-family: "Times New Roman";
    font-size: 20px;
}
```

myfile.htm:

```html
...
<head
...
    <link rel="stylesheet" type="text/css" href="stylesheet.css" />
    ..
</head>
...
```

Hyperlinks

```
<!DOCTYPE html>
<html>
<body>

<h1>This is a heading</h1>

<a href="http://www.google.com">This is a link to Google</a>

</body>
</html>
```

If you want to open the link in a new window or a new tab in your web browser:

```
<a hef="http://www.google.com" target="_blank">This is a link to Google</a>
```

Images

```
<!DOCTYPE html>
<html>
<body>

<h1>This is a heading</h1>

<img src= "myimage.jpg" alt="blabla" width="104" height="142">

</body>
</html>
```

Images

Typically, you want to put your images in a separate folder

```html
<html>
    <body>

        <h1>Welcome</h1>
        <p>Here you will learn about HTML. Below you see the HTML5 Logo</p>

        <img src= "html_logo.png">

    </b
</html>
```

```html
<!DOCTYPE html>
<html>

        <h1>Welcome</h1>
        <p>Here you will learn about HTML. Below you see the

        <img src= "images/html_logo.png" alt="HTML Logo">

    </body>
</html>
```

Make sure to use a so-called "**relative path**", i.e., do not not include the entire path like this "c:/mywebsite/images/html_logo.png"

Attributes

Each HTML Tag can have one or more so-called Attributes.

```
<img src= "myimage.jpg" alt= "An image of a car" width="104" height="142">
```

Attribute Name

Attribute Value

Attribute Value

The **Style** Attribute:

```
<h1 style="color: chocolate;">Welcome</h1>
```

Property Name

Property Value

If you use an editor like Visual Studio Code, which has IntelliSense, you will get a list of available choices.

Case sensitive?

- HTML is NOT case sensitive, meaning you can use
  `<h1>This is a heading</h1>`
  or `<H1>This is a heading</H1>`
- But the web server and file names can be case sensitive, so
  `<img src= "images/html_logo.png" alt="HTML Logo">`
  and `<img src= "IMAGES/html_LOGO.png" alt="HTML Logo">` may not be the same.
  - This is typically because the web server, like the Apache web server, is based on the Linux operating system, and Linux is case sensitive.
- This means if you are not able to see the image or are not able to find a web page or a document you are linking to, you probably have not used the correct upper/lower-case combination.
- **Recommendations!** So, try to stick to, e.g., using only lower cases on file names, also try to only use lower cases in HTML tags and attributes because it looks better if all tags are having the same casing.

Create a proper Folder structure

Make sure to create a proper folder structure: You should always think structure before you start coding.

Example:

My Web Site
    /css
        ...
    /documents

    ...
    /html
        ...
    /images
            ...
    /js
        ...
    index.html

CSS

Hans-Petter Halvorsen

Web Programming Triangle

You use **HTML** to define the content of web pages

HTML

You use **JavaScript** to program the behavior of web pages

You use **CSS** to specify the layout of web pages

Web Pages

CSS

JavaScript
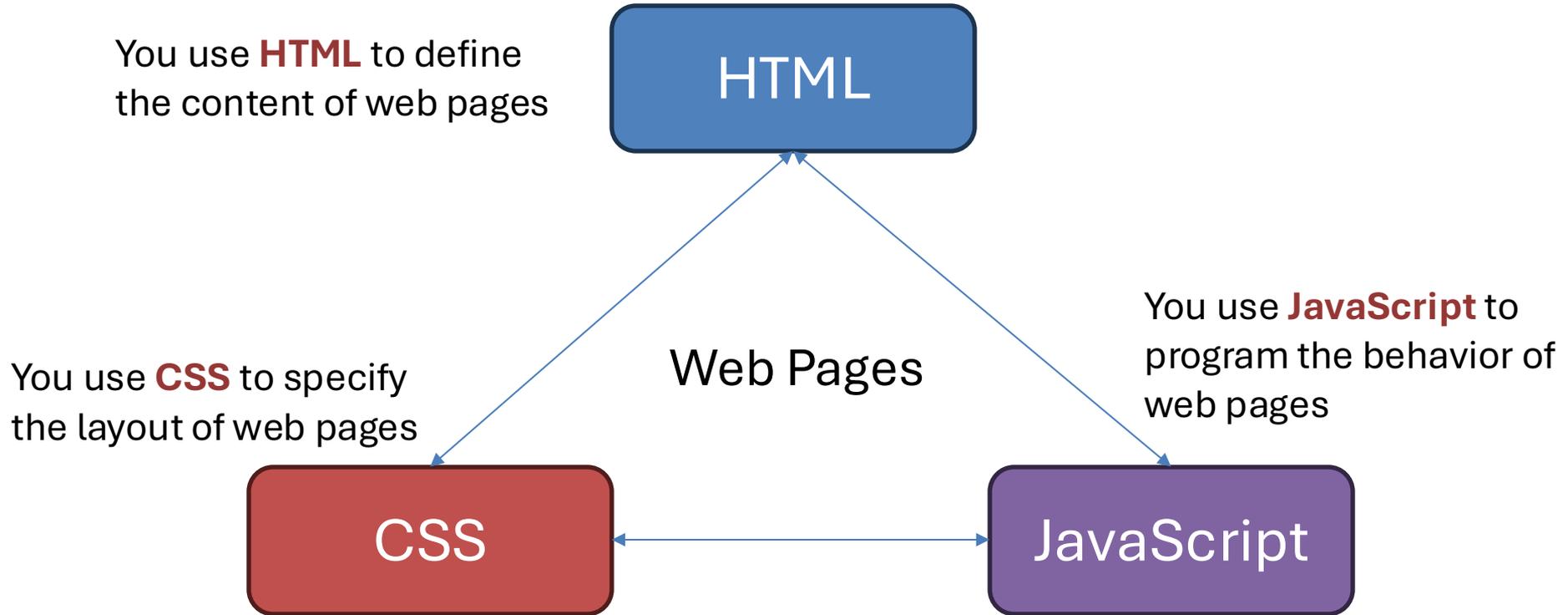
CSS

- CSS is a language that describes the style of an HTML document.
- CSS describes how HTML elements should be displayed.
- Examples: Font Size, Colors, Alignment, etc.
- We have 3 different types of CSS:
  - Inline
  - Internal
  - External

Inline CSS

For Inline CSS we use the style attribute for a single HTML tag. Examples:

```
<h1 style="color: chocolate;">Welcome</h1>
```

      ↑   ↑

  Property   Property

   Name   Value

```
<p> style="color: red;">Welcome</p>
```

      ↑   ↑

  Property   Property

   Name   Value

Internal CSS

Internal CSS is used to set the style for the entire HTML page. We then use the <style> element inside the <head> section. See Example:

External CSS

A recommended way to use CSS is to put all CSS styling and formatting into separate file and then link that document into the different HTML files. In that way you have all CSS in one place, and you can easily change the CSS for all your HTML files by only change it one place.

stylesheet.css:

```css
body {
    background-color: #d0e4fe;
}

h1 {

    color: orange;
    text-align: center;
}

p {

    font-family: "Times New Roman";
    font-size: 20px;
}
```

myfile.htm:

```html
...
<head
...
    <link rel="stylesheet" type="text/css" href="stylesheet.css" />
    ..
</head>
...
```
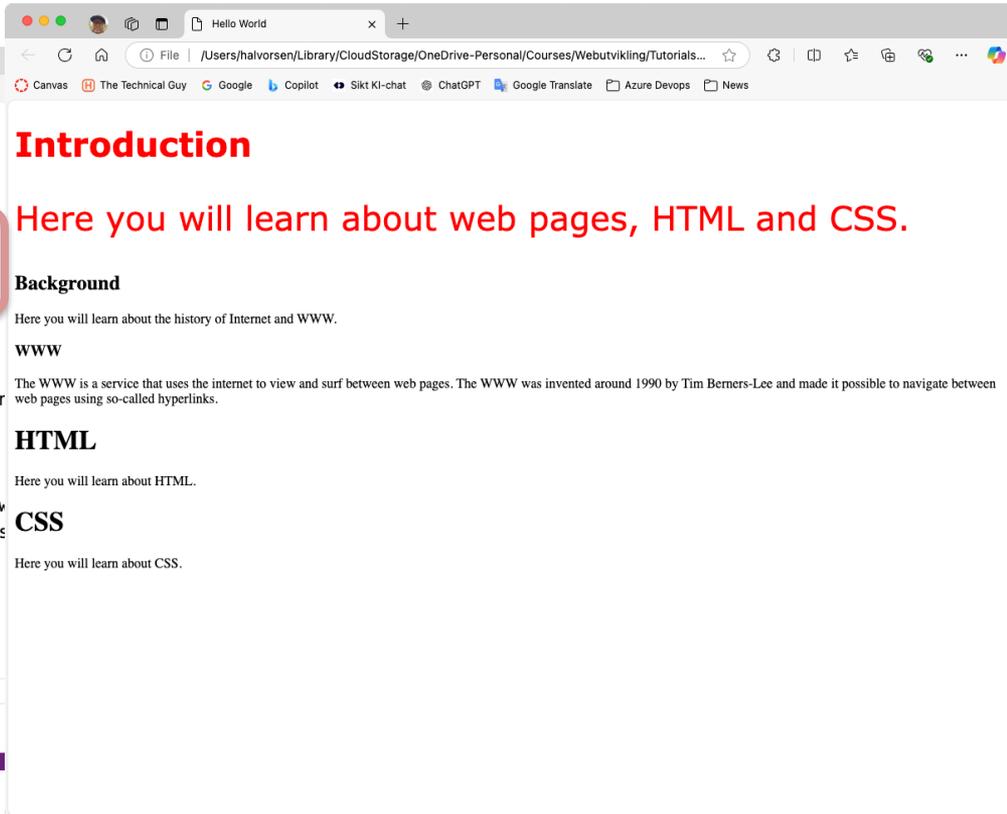
CSS and Class Attribute

If we want multiple elements to have the same styling ,we can combine CSS with the Class attribute.

HTML User Input and Forms

Hans-Petter Halvorsen

HTML User Input

HTML has different elements for user input, like textbox, textarea, dropdown, button, etc.

Textbox:

```
<input type="text" id="myname" name="myname">
```

Text Area:

```
<textarea name="id" name="description" rows="5" cols="50">

Write something about yourself.

</textarea>
```

Dropdown:

```
<select id="cars" name="cars">

<option value="blue">Blue</option>

<option value="green">Green</option>

<option value="yellow">Yellow</option>

<option value="purple">Purple</option>

</select>
```
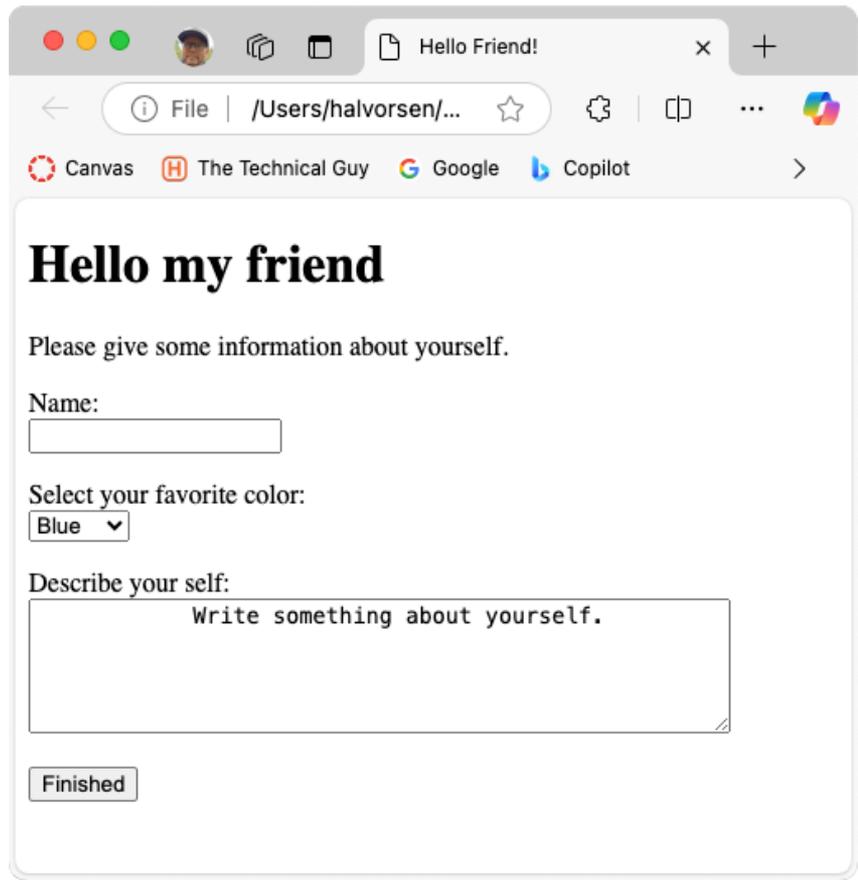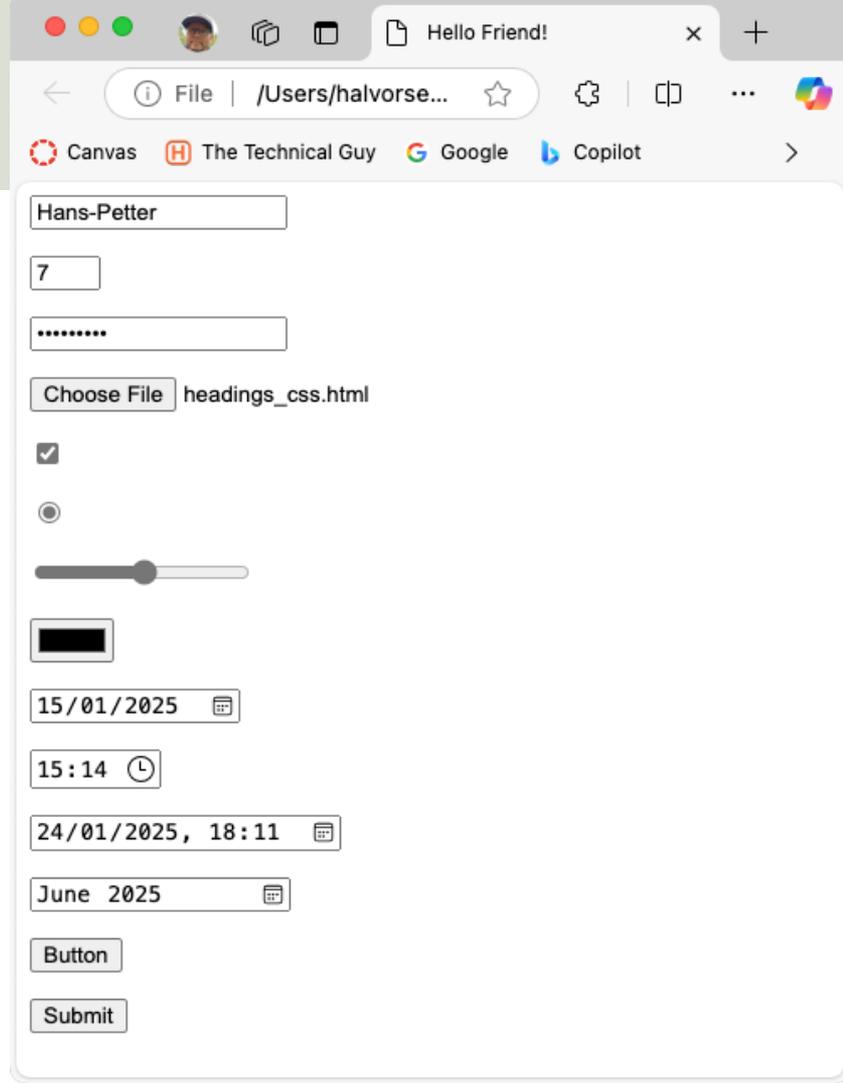
Button:

```
<button type="button" onclick="alert('Thank you')">Finished</button>
```

User Input Examples

HTML Input Types

```
user_input_types.html ×

Users > halvorsen > Library > CloudStorage > OneDrive-Personal > Courses > Webutvikling > Tutorials > HTML > Examples > <> user_input_typ

  1  <!DOCTYPE html>
  2  <html>
  3      <head>
  4          <title>Hello Friend!</title>
  5      </head>
  6      <body>
  7
  8          <input type="text" value="Hans-Petter"><p></p>
  9          <input type="number" min="1" max="10"><p></p>
 10          <input type="password"><p></p>
 11          <input type="file"><p></p>
 12
 13          <input type="checkbox"><p></p>
 14          <input type="radio"><p></p>
 15          <input type="range"><p></p>
 16          <input type="color"><p></p>
 17
 18          <input type="date"><p></p>
 19          <input type="time"><p></p>
 20          <input type="datetime-local"><p></p>
 21          <input type="month"><p></p>
 22
 23          <input type="button" value="Button"><p></p>
 24          <input type="submit">
 25
 26      </body>
 27  </html>
```

HTML Forms

- An HTML form is used to collect user input data.

- Then this data is often sent to a server for processing, save data to a database, etc.

HTML Forms Example


```html
<!DOCTYPE html>
<html>

    <head>
        <title>Hello World</title>
    </head>

    <body>

        <h1>Personal information</h1>
        <p>Please enter information about yourself.</p>

        <form action="savedata.php">
            <label for="firstname">First Name:</label><br>
            <input type="text" id="firstname" name="firstname" value="Hans-Petter"><br><

            <label for="lastname">Last Name:</label><br>
            <input type="text" id="lastname" name="lastname" value="Halvorsen"><br><br>

            <input type="submit" value="Save">
        </form>

    </body>
</html>
```

Personal information

Please enter information about yourself.

First Name:
Hans-Petter

Last Name:
Halvorsen

Save
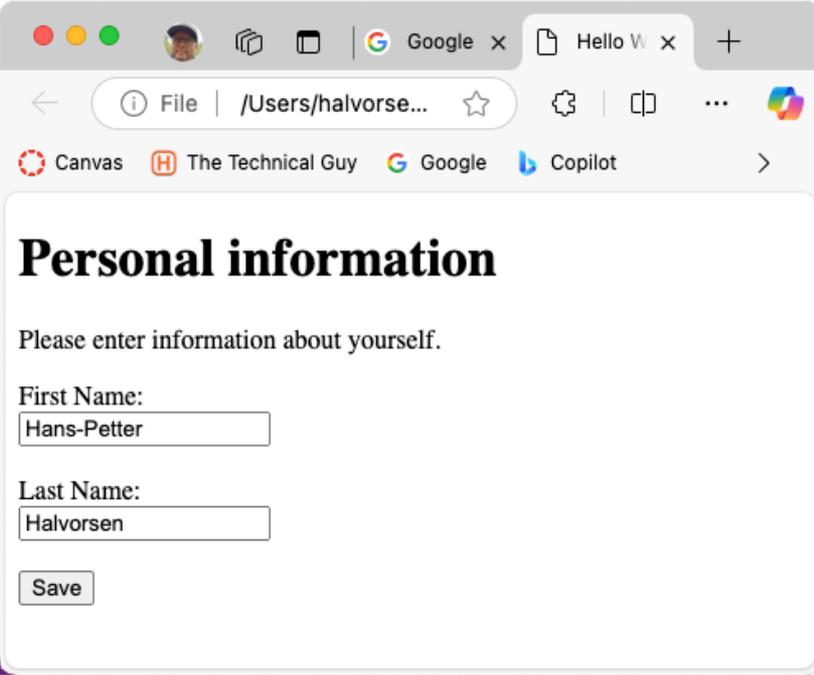
Code Exaplained

Here you specify the server-side page that shall process the data. Here you typically use, e.g., PHP, or ASP.NET for processing and saving data to a database.

```
<form action="savedata.php">

  <label for="firstname">First Name:</label><br>

  <input type="text" id="firstname" name="firstname" value="Hans-Petter"><br><br>


  <label for="lastname">Last Name:</label><br>

  <input type="text" id="lastname" name="lastname" value="Halvorsen"><br><br>


  <input type="submit" value="Save">
</form>
```

Here you define a button for submitting the data, typically to the server for further processing.

JavaScript

Hans-Petter Halvorsen

Web Programming Triangle

HTML

CSS

JavaScript

You use **HTML** to define the content of web pages

You use **CSS** to specify the layout of web pages

You use **JavaScript** to program the behavior of web pages
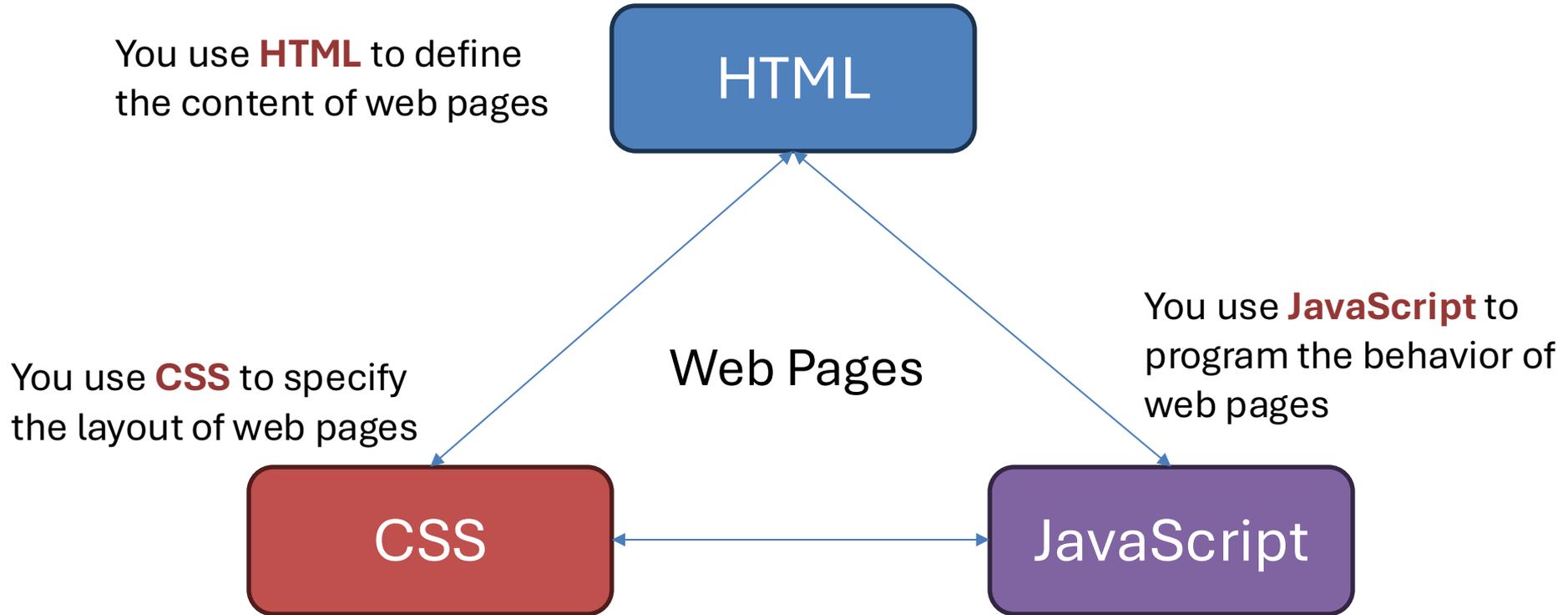
Web Pages

JavaScript

- You use JavaScript to program the behavior of web pages.
- You can use JavaScript to make your web pages more dynamic, e.g.,:
  - you can specify what happens when a user clicks on a button, etc.
  - You can update contents on the HTML web page
  - You can create and use Functions, create variables, if – else, etc. – just like other programming languages.
- You use the <script> tag to define JavaScript code within your HTML files.

Button Click Example

```html
1  <!DOCTYPE html>
2  <html>
3  <head>
4      <title>Button Click Example</title>
5      <script>
6          function ButtonClick() {
7              alert("The author of this article is Hans-Petter Halvorsen");
8          }
9      </script>
10 </head>
11 <body>
12     <h1>Introduction</h1>
13         <p>Here you will learn about HTML.</p>
14
15         <button onclick="ButtonClick()">Show Author</button>
16
17         <h2>Background</h2>
18         <p>Here you will learn about the history of Internet a
19 </body>
20 </html>
```
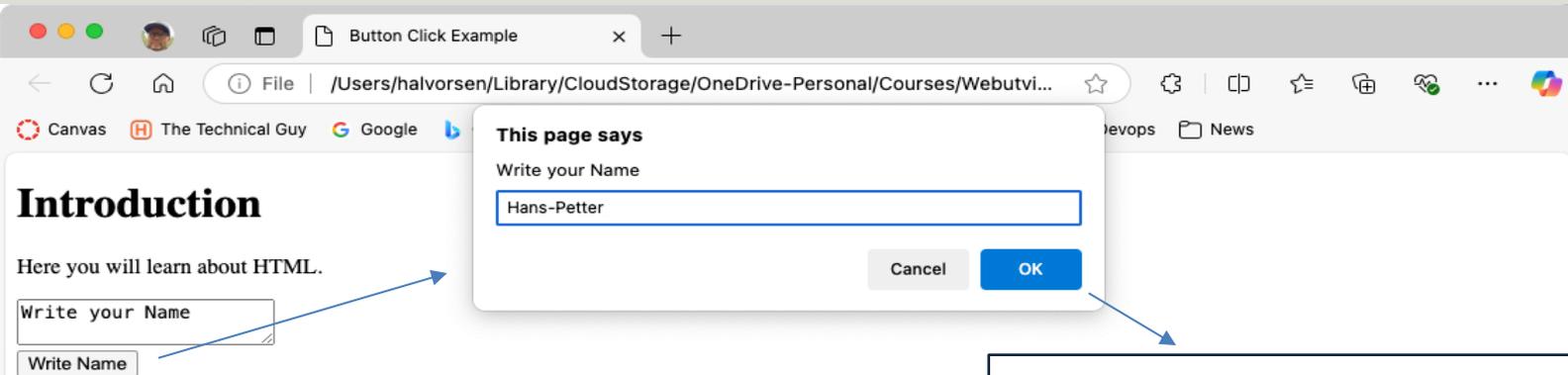
Introduction

Here you will learn about HTML.

Show Author

Background

Here you will learn about the history of Internet and WWW.

This page says

The author of this article is Hans-Petter Halvorsen

OK
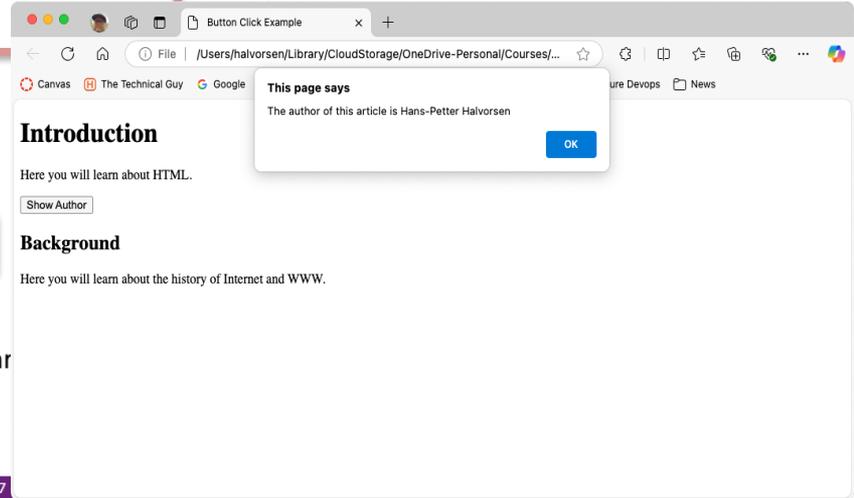
Update Web contents

Here we use JavaScript to update the contents of a "textbox" based on user input.

Update Web contents


```html
1   <!DOCTYPE html>
2   <html>
3   <head>
4       <title>Button Click Example</title>
5       <script>
6           function ButtonWriteNameClick() {
7               let myname;
8               myname = prompt("Write your Name");
9
10              if (myname != null && myname != "")
11                  document.getElementById("myname").innerHTML = myname
12          }
13      </script>
14  </head>
15  <body>
16      <h1>Introduction</h1>
17          <p>Here you will learn about HTML.</p>
18
19          <textarea id="myname">Write your Name</textarea>
20          <br>
21          <button onclick="ButtonWriteNameClick()">Write Name</button>
22
23          <h2>Background</h2>
24          <p>Here you will learn about the history of Internet and WWW.</p>
25  </body>
26  </html>
```
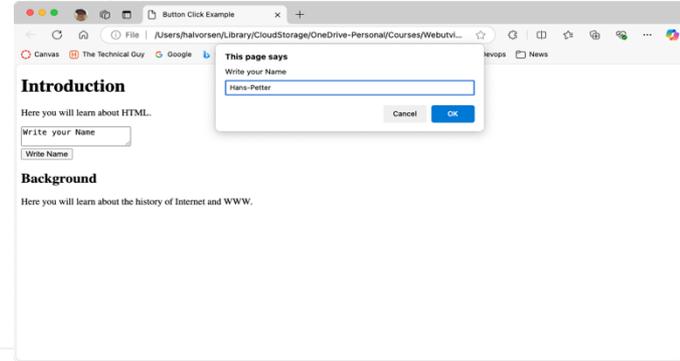
Bootstrap

Hans-Petter Halvorsen

Bootstrap

- To create modern web pages and web applications today, it needs good design, layout and it needs to work on all kind of devices like PCs and smartphones, etc.

- Bootstrap is a popular CSS framework that is used by many web developers today. Bootstrap also uses JavaScript to create interactivity and animations, etc.

- By using such a framework like Bootstrap or similar you can focus on developing the application features and let Bootstrap do most of the layout, etc.

- https://getbootstrap.com

Using Bootstrap

You can start using Bootstrap in different ways. The simplest method is to include the CSS and the JavaScript libraries in in the <head></head> section your HTML files.

1. Put Bootstrap CSS Library:

```
<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/css/bootstrap.min.css" rel="stylesheet">
```
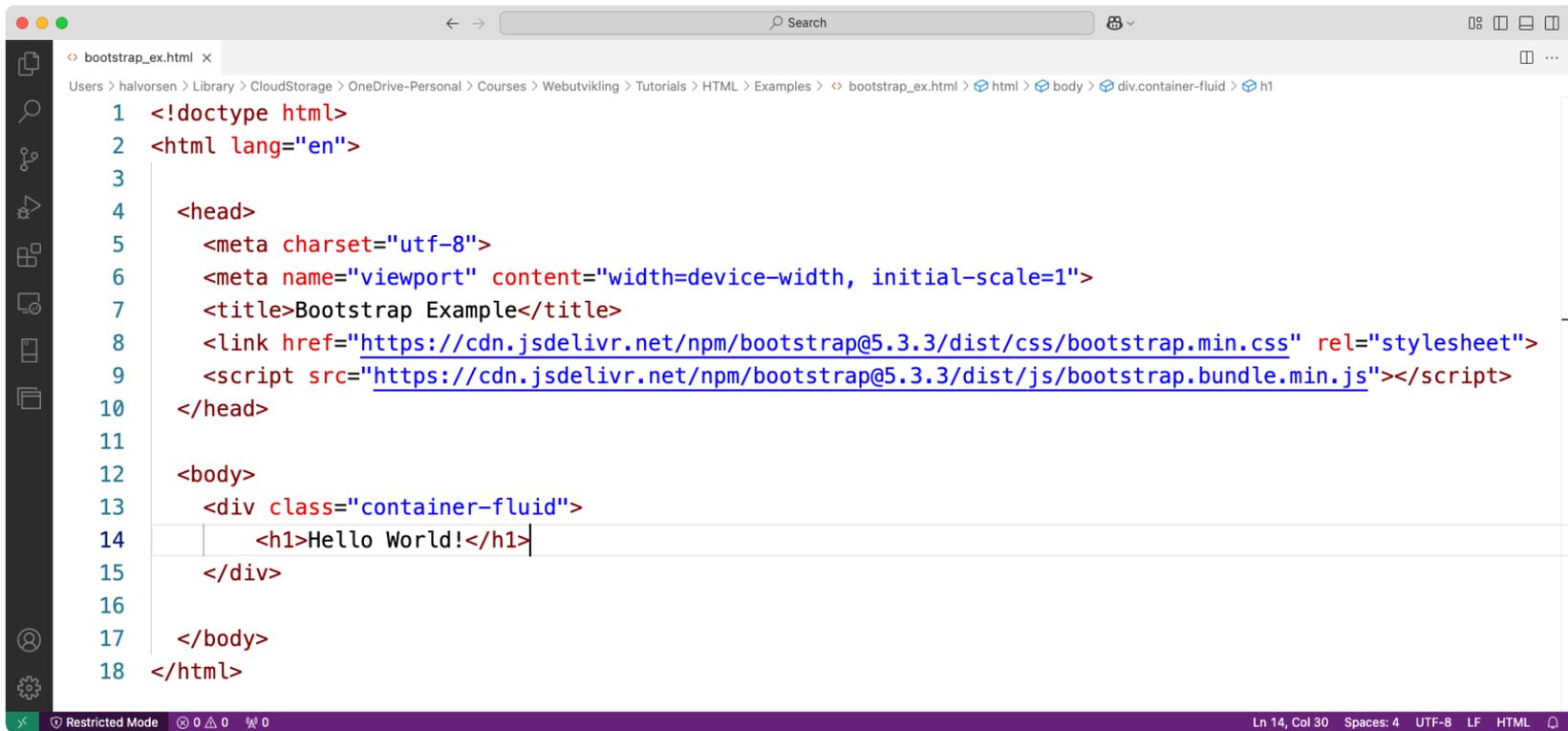
2. Bootstrap JavaScript Library :

```
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/js/bootstrap.bundle.min.js"></script>
```

3. This line of code ensures your code works fine on all devices like smartphones, etc:

```
<meta name="viewport" content="width=device-width, initial-scale=1">
```

Hello World Example


```html
1  <!doctype html>
2  <html lang="en">
3
4    <head>
5      <meta charset="utf-8">
6      <meta name="viewport" content="width=device-width, initial-scale=1">
7      <title>Bootstrap Example</title>
8      <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/css/bootstrap.min.css" rel="stylesheet">
9      <script src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/js/bootstrap.bundle.min.js"></script>
10   </head>
11
12   <body>
13     <div class="container-fluid">
14         <h1>Hello World!</h1>
15     </div>
16
17   </body>
18 </html>
```

Hello World Example

```
<!doctype html>
<html lang="en">

<head>
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1">
  <title>Bootstrap Example</title>
  <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/css/bootstrap.min.css" rel="stylesheet">
  <script src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/js/bootstrap.bundle.min.js"></script>
</head>

<body>

  <div class="container-fluid">
    <h1>Hello World!</h1>
  </div>
  </body>

</html>
```

No formatting vs Bootstrap

bootstrap_ex2.html ×

Users > halvorsen > Library > CloudStorage > OneDrive-Personal > Courses > Webutvikling > Tutorials > HTML > Examples > ◇ bootstrap_ex2.html > ◇ html > ◇ body > ◇ div.container-fluid.pt-5 > ◇ form

```html
<!doctype html>
<html lang="en">

  <head>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <title>Bootstrap Example</title>
    <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/css/bootstrap.min.css" rel="stylesheet">
    <script src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/js/bootstrap.bundle.min.js"></script>
  </head>

  <body>
    <div class="container-fluid pt-5">
        <h1>Personal information</h1>
        <p>Please enter information about yourself.</p>

        <form action="savedata.php">
            <label for="firstname" class="form-label">First Name:</label><br>
            <input type="text" class="form-control" id="firstname" name="firstname" value="Hans-Petter"><br>

            <label for="lastname" class="form-label">Last Name:</label><br>
            <input type="text" class="form-control" id="lastname" name="lastname" value="Halvorsen"><br>

            <input type="submit" value="Save" class="btn btn-success">
        </form>

    </div>
  </body>
</html>
```

Icon Libraries

- To spice up your web pages, it can be nice to have a wide selection of icons. There exists lots of icon libraries that can be used, e.g.:

- Bootstrap Icons: https://icons.getbootstrap.com

- Font Awesome: https://fontawesome.com

- Google Icons: https://fonts.google.com/icons

Resources and References

- **HTML Tutorial**: https://www.w3schools.com/html
- HTML Fundamentals Videos (w3school): https://www.youtube.com/playlist?list=PLP9IO4UYNF0VdAajP_5pYG-jG2JRrG72s
- **CSS Tutorial**: https://www.w3schools.com/css
- CSS Fundamentals Videos (w3school): https://www.youtube.com/playlist?list=PLP9IO4UYNF0UCaUSF3XNZ1U9f01E5h5PM
- **JavaScript Tutorial**: https://www.w3schools.com/js
- JavaScript Fundamentals Videos (w3school): https://www.youtube.com/playlist?list=PLP9IO4UYNF0WWmZpE3W33vVPRl2GvjEqz
- **Bootstrap**: https://www.w3schools.com/bootstrap5

Hans-Petter Halvorsen

University of South-Eastern Norway

www.usn.no

E-mail: hans.p.halvorsen@usn.no

Web: https://www.halvorsen.blog