

# Web Engineering LAB



## **Lab 02** **Introduction to HTML**

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## How Websites Are Created

All websites use HTML and CSS, but content management systems, blogging software, and e-commerce platforms often add a few more technologies into the mix.

Small websites are often written just using HTML and CSS. Larger websites — in particular those that are updated regularly and use a content management system (CMS), blogging tools, or e-commerce software — often make use of more complex technologies on the web server, but these technologies are actually used to produce HTML and CSS that is then sent to the browser. So, if your site uses these technologies, you will be able to use your new HTML and CSS knowledge to take more control over how your site looks.

When you are looking at a website, it is most likely that your browser will be receiving HTML and CSS from the web server that hosts the site. The web browser interprets the HTML and CSS code to create the page that you see.

## HTML Basics

HTML pages are created by tagging textual information with HTML markup. HTML markup consists of tags, which appear inside angled brackets `<` and `>`. An example of an HTML tag is `<B>`, which causes text to appear in bold. `<B>` only notes where text should begin to appear in bold, while the tag `</B>` marks the end of the emboldening.

Tags act like containers. They tell you something about the information that lies between their opening and closing tags. Most HTML tags have a corresponding end tag, which is specified by the name of the tag preceded by the `/` character.

So, to create the text:

Internet Commerce is great!

The text is marked up as:

`<B>Internet Commerce is great!</B>`

## Getting started with HTML

You will need a Web browser and a text editor.

1. Open a text editor, create a new file and save it with the extension `.html`.
2. Add the following to the file:  

`<B> Welcome to Web Engineering Lab</B>`
3. Save the changes
4. Load the file in the web browser.

## Standard HTML Document Structure Format

A correct HTML document must always include certain structural tags. These tags are `<HTML>`, `<HEAD>`, `<BODY>` and `<TITLE>`.

The standard structure of the HTML document is:

```
<HTML>
  <HEAD>
    <TITLE> Text to appear in the title bar of the browser
  </TITLE>
  </HEAD>
  <BODY>
    The text appear in the main browser window
  </BODY>
</HTML>
```

This format should always be used when writing HTML documents.

## Text

When creating a web page, you add tags (known as markup) to the contents of the page. These tags provide extra meaning and allow browsers to show users the appropriate structure for the page.

## Headings

HTML has six "levels" of headings:

- `<h1>`
- `<h2>`
- `<h3>`
- `<h4>`
- `<h5>`
- `<h6>`

`<h1>` is used for main headings, `<h2>` is used for subheadings and so on. Browsers display the contents of headings at different sizes. The contents of an `<h1>` element is the largest, and the contents of an `<h6>` element is the smallest.

1	<code>&lt;h1&gt;This is a Main Heading&lt;/h1&gt;</code>	<b>This is a Main Heading</b>
2	<code>&lt;h2&gt;This is a Level 2 Heading&lt;/h2&gt;</code>	<b>This is a Level 2 Heading</b>
3	<code>&lt;h3&gt;This is a Level 3 Heading&lt;/h3&gt;</code>	<b>This is a Level 3 Heading</b>
4	<code>&lt;h4&gt;This is a Level 4 Heading&lt;/h4&gt;</code>	<b>This is a Level 4 Heading</b>
5	<code>&lt;h5&gt;This is a Level 5 Heading&lt;/h5&gt;</code>	<b>This is a Level 5 Heading</b>
6	<code>&lt;h6&gt;This is a Level 6 Heading&lt;/h6&gt;</code>	<b>This is a Level 6 Heading</b>
7		

## Paragraphs

To create a paragraph, surround the words that make up the paragraph with an opening `<p>` tag and closing `</p>` tag.

```
1 <p>Lorem ipsum dolor sit amet, consectetur adipiscing elit.
2 Fusce ut eros sit amet ex imperdiet elementum quis eget
3 mauris. Interdum et malesuada fames ac ante ipsum primis in
4 faucibus. Maecenas fermentum et felis nec commodo. Nunc
5 eget sollicitudin leo, vel bibendum ante. Fusce interdum
6 accumsan nibh, at viverra lacus aliquam et. Class aptent
7 taciti sociosqu ad litora torquent per conubia nostra, per
8 inceptos himenaeos. Etiam tristique massa nec porta varius.
9 Aenean ac tellus nec elit laoreet luctus. Curabitur convallis
10 porta mauris ac ultricies. Nunc rutrum diam non sem molestie
11 dapibus. Curabitur in dolor euismod, efficitur ex ac,
12 fringilla urna. Aliquam pretium, lectus sit amet ultrices
13 pulvinar, elit urna euismod nibh, eget dignissim elit risus
14 sit amet sapien. </p>
15
16 <p>Lorem ipsum dolor sit amet, consectetur adipiscing elit.
17 Fusce ut eros sit amet ex imperdiet elementum quis eget
18 mauris. Interdum et malesuada fames ac ante ipsum primis in
19 faucibus. Maecenas fermentum et felis nec commodo. Nunc
20 eget sollicitudin leo, vel bibendum ante. Fusce interdum
21 accumsan nibh, at viverra lacus aliquam et. Class aptent
22 taciti sociosqu ad litora torquent per conubia nostra, per
23 inceptos himenaeos. Etiam tristique massa nec porta varius.
24 Aenean ac tellus nec elit laoreet luctus. Curabitur convallis
25 porta mauris ac ultricies. Nunc rutrum diam non sem molestie
26 dapibus. Curabitur in dolor euismod, efficitur ex ac,
27 fringilla urna. Aliquam pretium, lectus sit amet ultrices
28 pulvinar, elit urna euismod nibh, eget dignissim elit risus
29 sit amet sapien. </p>
30
31
```

The pain itself is love, the main storage system. Fusce ut eros sit amet ex imperdiet elementum quis eget mauris. Sometimes the hunger and the unbelievable hunger in front of him, especially in the throat. Maecenas fermentum et felis nec commodo. Now need to worry about the lion, or drink before. At least some of the lakes and the cartoon. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos himenaeos Even the sad mass is not the gateway to the casino. Aenean ac tellus nec elit laoreet luctus. Curabitur convallis porta mauris ac ultricies. Now the makeup of the backyard is not a lot of annoying protein. The pain of the chronic pain, the result of it being made, and the urn is ecological. It's time to pay for it, the couch is a lot of vengeful cushion, the pain needs to be put to the budget

The pain itself is love, the main storage system. Fusce ut eros sit amet ex imperdiet elementum quis eget mauris. Sometimes the hunger and the unbelievable hunger in front of him, especially in the throat. Maecenas fermentum et felis nec commodo. Now need to worry about the lion, or drink before. At least some of the lakes and the cartoon. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos himenaeos Even the sad mass is not the gateway to the casino. Aenean ac tellus nec elit laoreet luctus. Curabitur convallis porta mauris ac ultricies. Now the makeup of the backyard is not a lot of annoying protein. The pain of the chronic pain, the result of it being made, and the urn is ecological. It's time to pay for it, the couch is a lot of vengeful cushion, the pain needs to be put to the budget

## Bold and italic

- By enclosing words in the tags `<b>` and `</b>` we can make characters appear bold.
- By enclosing words in the tags `<i>` and `</i>` we can make characters appear italic.

```
1 <p>This is how we make a word appear <b>bold.</b>
2 </p>
3 <p>Inside a product description you might see some
4 <b>key features</b> in bold.</p>
5
6
7 <p>This is how we make a word appear <i>italic</i>.
8 </p>
9
10 <p>It's a potato <i>Solanum tuberosum</i>.</p>
11 <p>Captain Cook sailed to Australia on the
12 <i>Endeavour</i>.</p>
13
```

This is how we make a word appear **bold**.

Inside a product description you might see some **key features** in bold.

This is how we make a word appear *italic*.

It's a potato *Solanum tuberosum*.

Captain Cook sailed to Australia on the *Endeavour*.

## Superscript and subscript

- The `<sup>` element is used to contain characters that should be superscript such as the suffixes of dates or mathematical concepts like raising a number to a power such as  $2^2$ .
- The `<sub>` element is used to contain characters that should be subscript. It is commonly used with foot notes or chemical formulas such as  $H_2O$ .

```
1 <p>On the 4<sup>th</sup> of September you will learn
2 about E=MC<sup>2</sup>.</p>
3 <p>The amount of CO<sub>2</sub> in the atmosphere
4 grew by 2ppm in 2009<sub>1</sub>.</p>
5
6
```

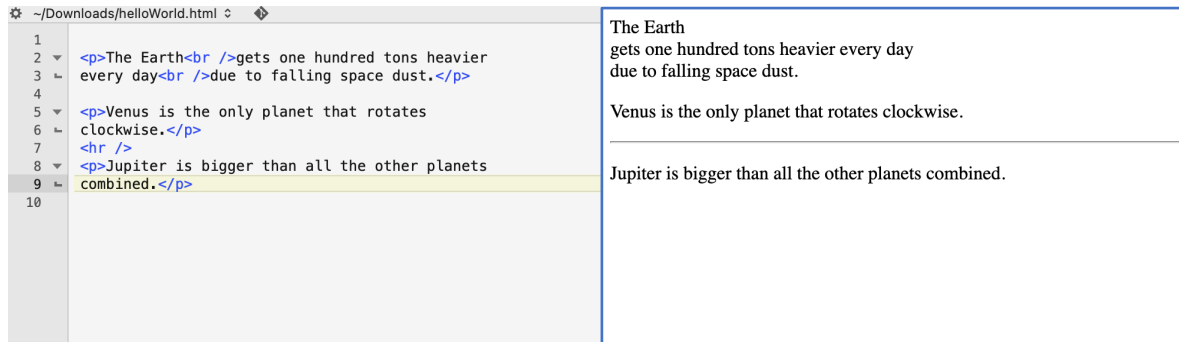
On the 4<sup>th</sup> of September you will learn about  $E=MC^2$ .

The amount of  $CO_2$  in the atmosphere grew by 2ppm in 2009<sub>1</sub>.

## Line Breaks & Horizontal Rules

- As you have already seen, the browser will automatically show each new paragraph or heading on a new line. But if you wanted to add a line break inside the middle of a paragraph you can use the line break tag `<br />`.
- To create a break between themes — such as a change of topic in a book or a new scene in a play — you can add a horizontal rule between sections using the `<hr />` tag.

Note: An empty element usually has only one tag.



## Semantic Markups

There are some text elements that are not intended to affect the structure of your web pages, but they do add extra information to the pages — they are known as semantic markup.

For example, the `<em>` element allows you to indicate where emphasis should be placed on selected words and the `<blockquote>` element which indicates that a block of text is a quotation.

### Strong & Emphasis

- The use of the `<strong>` element indicates that its content has strong importance.  
`<p><strong>Beware:</strong> Pickpockets operate in this area.</p>`
- The `<em>` element indicates emphasis that subtly changes the meaning of a sentence.  
`<p>I <em>think</em> Ivy was the first.</p>`

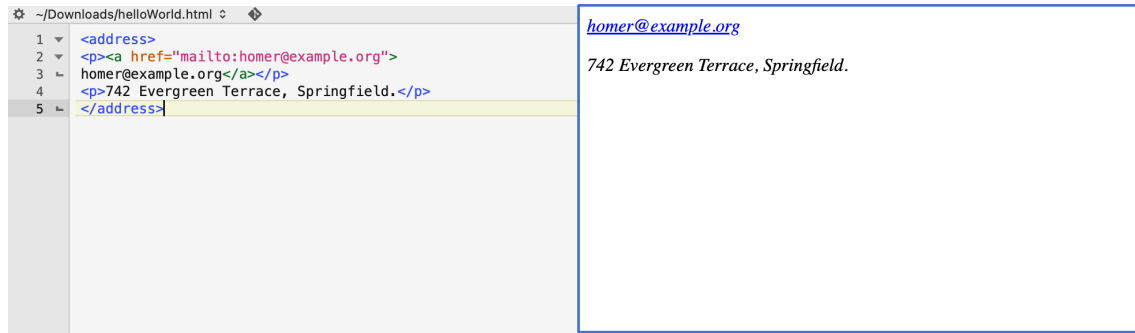
### Quotations

There are two elements commonly used for marking up quotations:

- The `<blockquote>` element is used for longer quotes that take up an entire paragraph.
- The `<q>` element is used for shorter quotes that sit within a paragraph.

### Author Details

The `<address>` element has quite a specific use: to contain contact details for the author of the page. It can contain a physical address, but it does not have to. For example, it may also contain a phone number or email address. Browsers often display the content of the `<address>` element in italics.



### Example:

This is a very simple HTML page that demonstrates text markup.

```
<html>
<head>
<title>Text</title>
</head>
<body>
<h1>The Story in the Book</h1>
<h2>Chapter 1</h2>
<p>Molly had been staring out of her window for about an hour now. On her desk, lying between
the copies of <i>Nature</i>, <i>New Scientist</i>, and all the other scientific journals her
work had appeared in, was a well thumbed copy of <cite>On The Road</cite>. It had been Molly's
favorite book since college, and the longer she spent in these four walls the more she felt
she needed to be free.</p>

<p>She had spent the last ten years in this room, sitting under a poster with an Oscar Wilde
quote proclaiming that <q>Work is the refuge of people who have nothing better to do</q>.
Although many considered her pioneering work, unravelling the secrets of the llama <abbr
title="Deoxyribonucleic acid">DNA</abbr>, to be an outstanding achievement, Molly <em>did</em>
think she had something better to do.</p>

</body>
</html>
```

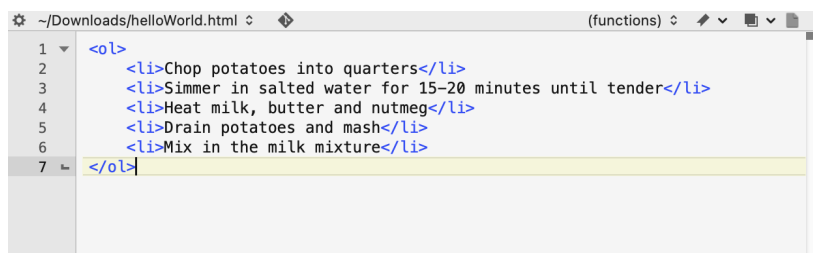
## Lists

There are lots of occasions when we need to use lists. HTML provides us with three different types:

- Ordered lists are lists where each item in the list is numbered. For example, a legal contract where each point needs to be identified by a section number.
- Unordered lists are lists that begin with a bullet point.
- Definition lists are made up of a set of terms along with the definitions for each of those terms.

### Ordered lists

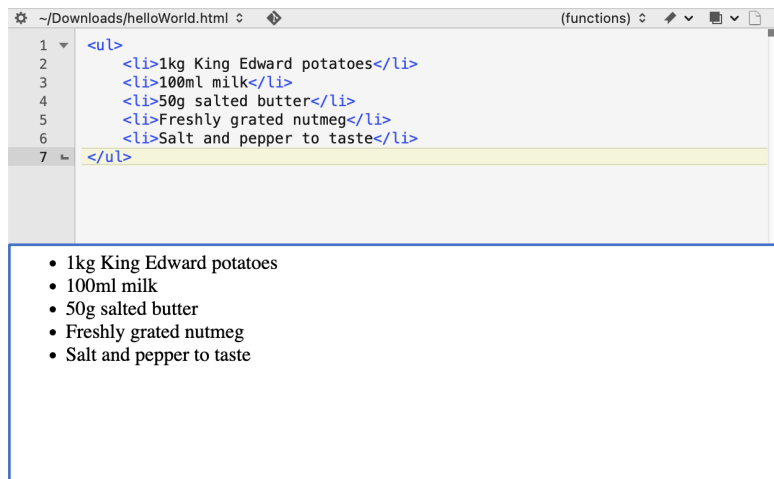
- The ordered list is created with the `<ol>` element.
- Each item in the list is placed between an opening `<li>` tag and a closing `</li>` tag. (The list ends for list item.)



1. Chop potatoes into quarters
2. Simmer in salted water for 15-20 minutes until tender
3. Heat milk, butter and nutmeg
4. Drain potatoes and mash
5. Mix in the milk mixture

## Unordered lists

- The unordered list is created with the `<ul>` element.
- Each item in the list is placed between an opening `<li>` tag and a closing `</li>` tag. (The li stands for list item.)



The screenshot shows a web browser window with the address bar displaying `~/Downloads/helloWorld.html`. The browser's developer tools are open, showing the HTML code for the page. The code is as follows:

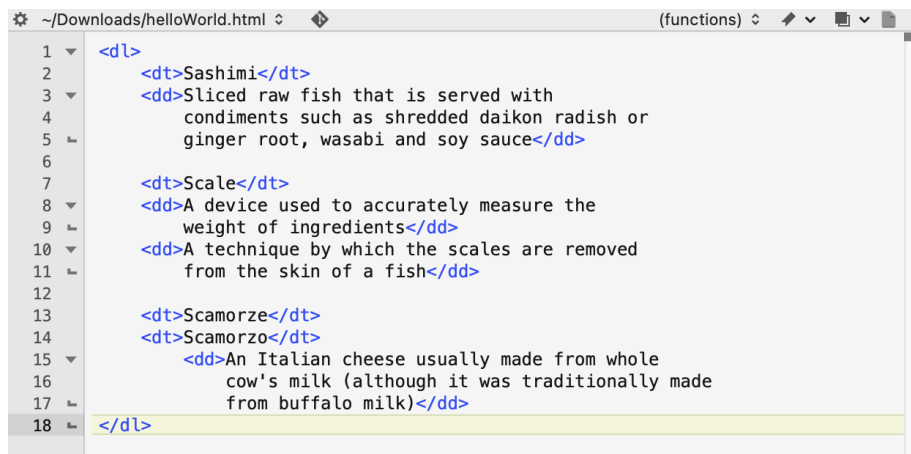
```
1 <ul>
2   <li>1kg King Edward potatoes</li>
3   <li>100ml milk</li>
4   <li>50g salted butter</li>
5   <li>Freshly grated nutmeg</li>
6   <li>Salt and pepper to taste</li>
7 </ul>
```

Below the code, the rendered HTML is shown as an unordered list:

- 1kg King Edward potatoes
- 100ml milk
- 50g salted butter
- Freshly grated nutmeg
- Salt and pepper to taste

## Definition lists

- The definition list is created with the `<dl>` element and usually consists of a series of terms and their definitions.
- Inside the `<dl>` element you will usually see pairs of `<dt>` and `<dd>` elements.
  - `<dt>` : This is used to contain the term being defined (the definition term).
  - `<dd>` : This is used to contain the definition.



The screenshot shows a web browser window with the address bar displaying `~/Downloads/helloWorld.html`. The browser's developer tools are open, showing the HTML code for the page. The code is as follows:

```
1 <dl>
2   <dt>Sashimi</dt>
3   <dd>Sliced raw fish that is served with
4     condiments such as shredded daikon radish or
5     ginger root, wasabi and soy sauce</dd>
6
7   <dt>Scale</dt>
8   <dd>A device used to accurately measure the
9     weight of ingredients</dd>
10  <dd>A technique by which the scales are removed
11    from the skin of a fish</dd>
12
13  <dt>Scamorze</dt>
14  <dt>Scamorzo</dt>
15  <dd>An Italian cheese usually made from whole
16    cow's milk (although it was traditionally made
17    from buffalo milk)</dd>
18 </dl>
```



## Links

Links are the defining feature of the web because they allow you to move from one web page to another — enabling the very idea of browsing or surfing.

You will commonly come across the following types of links:

- Links from one website to another
- Links from one page to another on the same website
- Links from one part of a web page to another part of the same page
- Links that open in a new browser window
- Links that start up your email program and address a new email to someone

Links are created using the `<a>` element. Users can click on anything between the opening `<a>` tag and the closing `</a>` tag. You specify which page you want to link to using the `href` attribute.



Links are created using the `<a>` element which has an attribute called `href`. The value of the `href` attribute is the page that you want people to go to when they click on the link.

When you link to a different website, the value of the `href` attribute will be the full web address for the site, which is known as an absolute URL.

### Linking to Other Pages on the Same Site

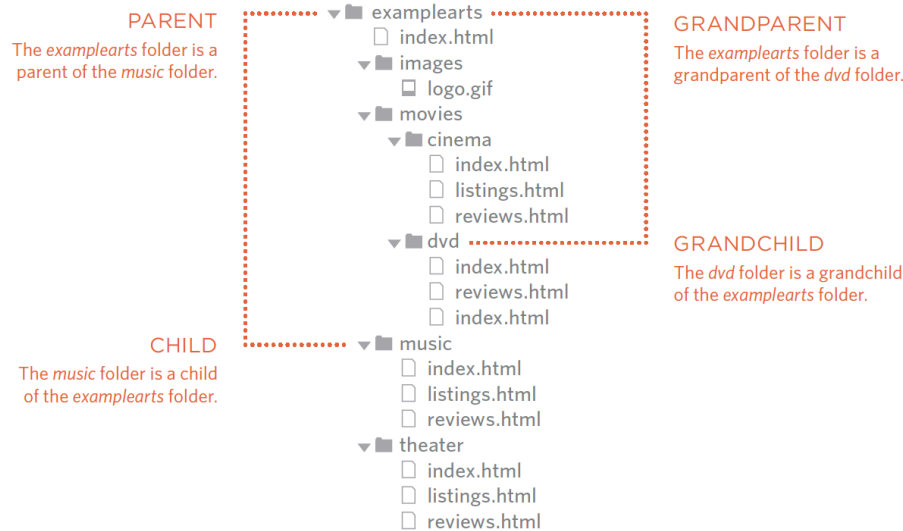
When you are linking to other pages within the same site, you do not need to specify the domain name in the URL. You can use a shorthand known as a relative URL. If all the pages of the site are in the same folder, then the value of the `href` attribute is just the name of the file.

```
<a href="index.html">Home</a>
<a href="about-us.html">About</a>
```

### Directory Structure

On larger websites it's a good idea to organize your code by placing the pages for each different section of the site into a new folder. Folders on a website are sometimes referred to as directories.

The diagram shows the directory structure for a fictional entertainment listings website called ExampleArts.



RELATIVE LINK TYPE	EXAMPLE (from diagram on previous page)
<b>SAME FOLDER</b> To link to a file in the same folder, just use the file name. (Nothing else is needed.)	To link to music reviews from the music homepage: <code>&lt;a href="reviews.html"&gt;Reviews&lt;/a&gt;</code>
<b>CHILD FOLDER</b> For a child folder, use the name of the child folder, followed by a forward slash, then the file name.	To link to music listings from the homepage: <code>&lt;a href="music/listings.html"&gt;Listings&lt;/a&gt;</code>
<b>GRANDCHILD FOLDER</b> Use the name of the child folder, followed by a forward slash, then the name of the grandchild folder, followed by another forward slash, then the file name.	To link to DVD reviews from the homepage: <code>&lt;a href="movies/dvd/reviews.html"&gt;Reviews&lt;/a&gt;</code>
<b>PARENT FOLDER</b> Use <code>../</code> to indicate the folder above the current one, then follow it with the file name.	To link to the homepage from the music reviews: <code>&lt;a href="../index.html"&gt;Home&lt;/a&gt;</code>
<b>GRANDPARENT FOLDER</b> Repeat the <code>../</code> to indicate that you want to go up two folders (rather than one), then follow it with the file name.	To link to the homepage from the DVD reviews: <code>&lt;a href="../../index.html"&gt;Home&lt;/a&gt;</code>

## Email Links

To create a link that starts up the user's email program and addresses an email to a specified email address, you use the `<a>` element. However, this time the value of the `href` attribute starts with `mailto:` and is followed by the email address you want the email to be sent to.

```
<a href="mailto:jon@example.org">Email Jon</a>
```

## Opening Links in a New Window

If you want a link to open in a new window, you can use the `target` attribute on the opening `<a>` tag. The value of this attribute should be `_blank`. One of the most common reasons a web page author might

want a link to be opened in a new window is if it points to another website. In such cases, they hope the user will return to the window containing their site after finishing looking at the other one.

```
<a href="http://www.imdb.com" target="_blank">  
Internet Movie Database</a> (opens in new window)
```

## Lab Tasks:

1. Create at least one web page using HTML relevant to your project that must use the following tags:
  - Headings, paragraph
  - Bold, italic, emphasis
  - Line Breaks & Horizontal Rules
  - Author Details
  - Ordered lists, Unordered List, Definition list, Nested List
  - Creating links between pages
  - Linking to other sites
  - Email links
2. On larger websites it's a good idea to organize your code by placing the pages for each different section of the site into a new folder. Folders on a website are sometimes referred to as directories. As your lab task, Create a directory structure of your website.

## References

- <https://www.geeksforgeeks.org/web-development/>
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