

Lab Manual

Programming with Python and Java (CS 29008)



School of Electronics Engineering
Kalinga Institute of Industrial Technology

Chapter 12

Lab 12: Front-end Development

Objective: To understand and apply the concepts of front-end design using HTML.

Outcome: After completing this lab, students would be able to develop a static webpage.

Prerequisite: Preinstalled VS Code (open-source text editor from Microsoft), basic programming concept.

I. Introduction

As the internet has become an integral part of our daily lives, learning web development is very important nowadays. In a rapidly evolving digital landscape, web development provides the foundation for creating and maintaining websites, applications, and online platforms that facilitate communication, commerce, and information-sharing. Proficiency in web development opens doors to numerous opportunities, whether it be in building personal websites, getting placement, or developing professional and interactive web applications for businesses.

Web design has three major components. These are:

- i) Front-end development (HTML, CSS, JS)
- ii) Back-end development (Python, Java, PHP, Node.js)
- iii) Database Management (MySQL, MongoDB, Oracle)

The basic data flow in software is given in the figure below.

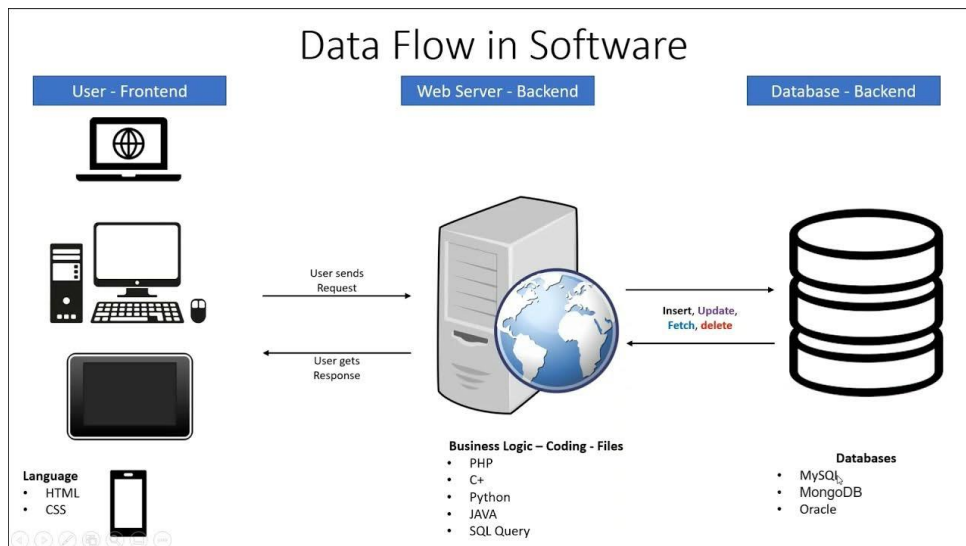


Fig. 1: Data flow in software

In this practical session, we will focus on front-end development. Front-end development has three parts

- i) Web page structural design using the Hypertext Markup Language (HTML)
- ii) Content style development using Cascading Style Sheets (CSS)
- iii) Defining functionality using JavaScript (JS)

II. Hypertext Markup Language (HTML)

In this section, we will learn HTML Coding. This enables us to create the basic structure of a static webpage. What kind of structure, we can build with this HTML code? Let us learn by considering the following example. Suppose, I want to make my one-page resume in a simple word document with a prescribed sample format given in Fig.2.

CURRICULUM VITAE

Name: Abc Dey Address: 101 Station Road NYZ, UX Email: abc.dey@abc.in Contact No.: 1234567890 Website: https://user.wixsite.com/user	photo
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Career Objective: Being a fresher, my basic object is not only to learn more or improve my efficiency skills but also to contribute my best in the field of Microbiology & Competitive environment.

Academic Details

Programme	Branch	Institution	University	Marks/CGPA	Year
B.Tech.	EEE	KIIT	KIIT	8.50	2016-20
XII	HS	DPS	WBCHSE	78.80%	2014-16
X	ME	DPS	WBBSE	81.62%	2012-14

Technical Skills

- Programming languages: C, C++, Java, Python
- Operating Systems: MS DoS, Windows, R²

Experience and Projects

- Minor Project
- Major Project

Social Media Handle

Linkedin
Facebook
Instagram
YouTube Icon
X

Fig.2: A sample resume made in word-document

The labels used in Fig.2 are given in the table below.

Table I: Labels used in Fig. 2

Label No.	Component
1	Header
2	Header
3	paragraph
4	Bold
5	Italic
6	Hyperlinked or anchored text
7	Horizontal ruler or Line
8	Table
9	Unordered list
10	Superscript
11	Ordered list
12	Footer
13	Hyperlinked Image
14	Image
15	Division
16	Underline

Can this same resume page be developed on a webpage (without any style)? Yes! The basic structure of Fig.2 with all the components given in Table-I can be created using HTML code. In Section IV, we will learn how to add these components to a static webpage. Before that, we will execute our first code in HTML.

III. First Code in HTML

Follow the steps to print “Hello World” on a live webpage using HTML.

- Create a folder on the Desktop.
- Install Visual Studio Code and click on ‘Open Folder’. Open the folder you have created.
- Close the ‘Welcome’ tab in VS Code.
- Click on ‘extensions’ (Ctrl + Shift + X) from the left panel. Search and install ‘live server’.
- After installing, go to the ‘Explorer’ tab on the left panel.
- Under your folder, create a new file and rename it as ‘index.html’ (no other names are allowed).
- Type the exclamation symbol (!) in line number 1 and click on the ‘Emmet Abbreviation’. Your program looks like Fig. 3.

```
1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4  |   <meta charset="UTF-8">
5  |   <meta name="viewport" content="width=device-width, initial-scale=1.0">
6  |   <title>Document</title>
7  </head>
8  <body>
9
10 </body>
11 </html>
```

Fig. 3: Basic structure of an HTML code

- viii. We always start editing our code from this standard code. We may edit line number 6. And, writing our whole webpage code within the <body> tag (between Lines 8 and 10).
- ix. Write your first code in HTML. You may give a suitable title and write “Hello World” inside the <body> tag. It looks like Fig. 4 below.

```
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <meta charset="UTF-8">
5   <meta name="viewport" content="width=device-width, initial-scale=1.0">
6   <title>My First HTML Code</title>
7 </head>
8 <body>
9   Hello World!
10 </body>
11 </html>
```

Fig.4: HTML Code to print “Hello World”

- x. Press ‘Ctrl + S’ to save and right-click and select ‘Open with live server’. Great. Hope, you get your output as given in Fig. 5 and successfully execute your first HTML code.

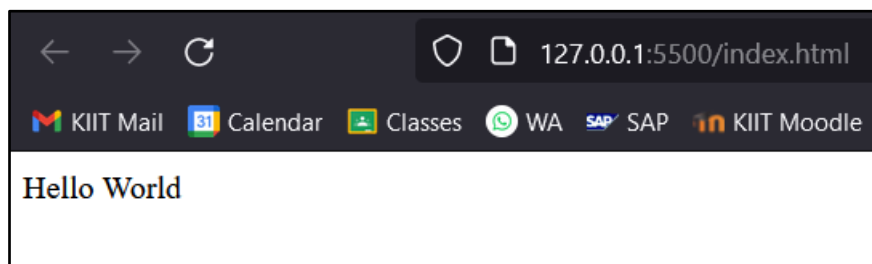


Fig. 5: The output “Hello World” on a Webpage

IV. Designing the web page component-wise

In this section, we will learn how to add the necessary components required for designing the webpage as shown in Fig.2.

Adding a heading:

<h1> Add your paragraph here. </h1>

The whole sentence is known as an HTML element.

Adding a paragraph:

<p> Add your paragraph here. </p>

Adding an attribute in a tag:

Attributes are used to add more information to the tag.

<html lang = “en”> Add your HTML code here. </html>

Adding an image tag:

Image tags are used to add images on the webpage.

Type 1: Absolute image

```

```

Type 2: Relative image

```

```

Adding a hyperlinked text or an anchor tag:

Anchor tags are used to add hyper reference links on the webpage.

Type 1: Absolute link

Used to link any online webpage

```
<a href="www.google.com"> Google </a>
```

Type 2: Relative Link

Used to link the local webpage

```
<a href= "<path to your html file>"> About Me </a>
```

Type 3: Open in another tab

```
<a href=www.google.com target = "_blank"> Google </a>
```

Adding a hyperlink to an image:

```
<a href=www.google.com target = "_main" <img src = "https:link" alt = "Google" height = "100"> Google </a>
```

Adding a Bold effect:

```
<b> Text </b>
```

Adding an Italic effect:

```
<i> Text </i>
```

Adding an Underline effect:

```
<u> Text </u>
```

Adding a Line Break:

```
<br> or </br>
```

Adding a Horizontal Ruler tag:

```
<hr> or </hr>
```

Adding a Superscript:

```
<sup> Text </sup>
```

Adding a Subscript:

```
<sub> Text </sub>
```

Adding a space-controlled text:

```
<pre> Text </pre>
```

Adding a header:

```
<header> Text </header>
```

Adding a footer:

```
<footer> Text </footer>
```

Adding a section:

```
<main>
  <section>
    Academic achievement
  </section>
  <section>
    Extra-curricular achievement
  </section>

  <section>
    Awards and recognition
  </section>
</main>
```

Adding a division (Non-semantic Block element):

```
<div>
  <p> Text 1 </p>
  <p> Text 2 </p>
  <p> Text 3 </p>
</div>
<div>
  <p> Text 4 </p>
  <p> Text 5 </p>
  <p> Text 6 </p>
</div>
```

Adding a span (non-semantic inline element):

```
<span>
  <p> Text 1 </p>
  <p> Text 2 </p>
  <p> Text 3 </p>
</span>
<span>
  <p> Text 4 </p>
  <p> Text 5 </p>
  <p> Text 6 </p>
</span>
```

Adding an unordered (bullet point-wise) list:

```
<ul>
    <li> Item 1 </li>
    <li> Item 2 </li>
    <li> Item 3 </li>
</ul>
```

Adding an ordered (enumerated) list:

```
<ol>
    <li> Item 1 </li>
    <li> Item 2 </li>
    <li> Item 3 </li>
</ol>
```

Adding a table:

<table>	%to initialize the table
<thead>	%to wrap the table header
<caption> Student Data </caption>	%to give a caption
<tr>	% to create table row
<th> Name </th>	% to give table header
<th> Roll </th>	% to give table header
</tr>	% to close table row
</thead>	% end of table head
<tbody>	%to wrap the table body
<tr>	% to create table row
<td> ABC </td>	% to insert table data
<td> 100 </td>	% to insert table data
</tr>	% to close table row
</tbody>	% end of table body
</table>	%to finish the table

Adding an iframe tag:

iframe tag is used to add a live website inside your website.

```
<iframe scr = "link"><\iframe>
```

N.B: To add a YouTube video. Click on the 'Share' option below in that video and click on the 'Embed' option. Further, copy the iframe portion and paste it as src (source).

Adding a Video tag:

A video tag is used to add a video (relative or absolute) to your website.

```
<video scr = "myvideo.mp4"></video>
```

N.B: Some useful attributes related to this video tag are controls, autoplay, width, height, and loop.

List of block tags:

<address>, <article>, <aside>, <blockquote>, <canvas>, <dd>, <div>, <dl>, <dt>, <fieldset>, <figcaption>, <figure>, <footer>, <form>, <h1>-<h6>, <header>, <hr>, , <main>, <nav>, <noscript>, , <p>, <pre>, <section>, <table>, <tfoot>, , <video>

List of inline tags:

<a>, <abbr>, <acronym>, , <bdo>, <big>,
, <button>, <cite>, <code>, <dfn>, , <i>, , <input>, <kbd>, <label>, <map>, <object>, <output>, <q>, <samp>, <script>, <select>, <small>, , , <sub>, <sup>, <textarea>, <time>, <tt>, <var>

[If you are interested, you may Google and understand the functionality of each and every tag listed above.]

V. Conclusion

Using the above-listed tools and techniques in HTML, we can easily design the basic structure of a simple Resume or Portfolio website (static) or personal webpage.

Exercise Problems

1. Let us consider the Fig.2. Except for the photo (marked 14), design the full resume structure on a static webpage using the HTML in VS Code.

Viva Questions

1. What do you mean by HTML tag? Give example.
2. What happen, if we use <h2> ... <\h2>, instead of <h1> ... <\h1>?
3. Give two examples where only one tag is used instead of opening and closing tags.
4. How to see my webpage in phone mode?
5. Why we comment a line in HTML? What is its shortcut?
6. What do you mean by the term 'Attribute' in HTML coding? Give example.
7. Have you used 'Toggle word wrap'? Why it is used?
8. Does has an end tag?
9. Why we are not using height and width attribute in parallel while using image tag?
10. Which tag is used to print in next line?
11. How <p>...</p> is differ from <pre>...</pre>?
12. What is the difference between semantic and non-semantic tags? Give examples of each.
13. How <div> is differ from <section>?
14. How many types of lists you have used so far? Give example.
15. How to add a table and image on a webpage. Give syntax.