

ALBANY STATE UNIVERSITY, GA

# WEB DESIGN AND DEVELOPMENT USING AI

CHAPTER TWO - BRIEF OF HTML/CSS/JAVACRIPT

BY

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# CHAPTER 2 — BRIEF OF HTML/CSS/JAVASCRIPT

We will use VSCODE-OPENAI chatbot to chat with AI, which creates necessary codes for HTML/CSS/JAVASCRIPT. In this chapter, we will present a basic structure of each of HTML, CSS, and JAVASCRIPT.

## Section 2.1 HTML structure

An HTML document or a webpage is a collection of boxes. Each box is called an HTML element. An html element or a box is coded in the format of

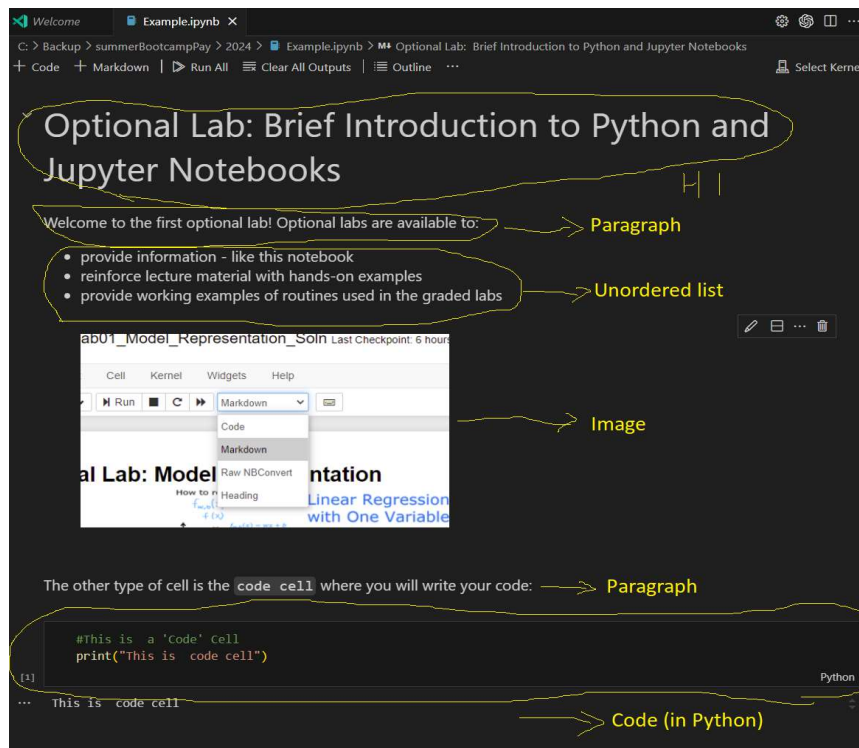
**`<tag_name>content</tag_name>`.**

For instance, a headline box looks like one of the following, where `<h1>` has the largest font size and `<h6>` has the smallest font size.

1. `<h1>Introduction</h1>`
2. `<h2>Name</h2>`
3. ...
4. `<h6>subtitle</h6>`

To create a webpage, you will describe what it looks using the following terminologies: “header”, “main”, “footer” and others inside each of them.

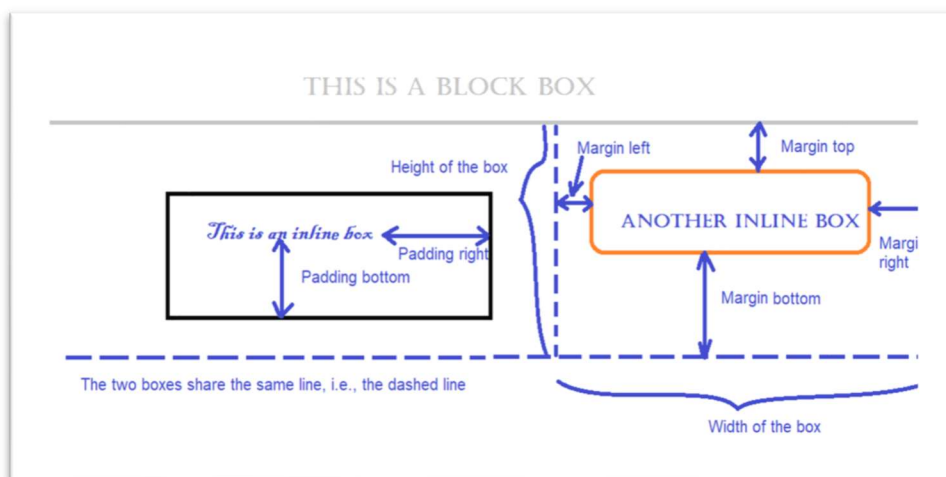
1. Inside header, you can add title, menu, logo
2. Inside main, you can add a list of rows (or containers). In each row, you can add some columns by telling the AI the percentage of width. Then, inside each column, you add anything such as images, or gallery of images, paragraphs, headlines, ordered or unordered lists.
3. Inside footer, you can add one row and several columns, each column can list a few links to other webpages.
4. For our summer camp, we will create something like the following, which is similar to a Jupyter Notebook. Almost all machine learning models are coded and explained in a Jupyter notebook. We will not discuss it in this camp. Instead, we will use HTML/JavaScript to build a similar webpage.



5. There are many more features in HTML. If you are interested, you can go over a wonderful tutorial provided by <https://www.w3schools.com>.

## Section 2.2 CSS

There are two types of boxes, i.e., the block boxes (block elements) and inline boxes (inline elements). A block box will occupy the whole line, which means no other boxes are allowed on the same line from left to right. An inline box will share with other boxes on the same line. The following picture shows one block box with content “THIS IS A BLOCK BOX”, and two inline boxes with contents “This is an inline box” and “ANOTHER INLINE BOX”.



A box may have styles, such as font-family, font-color, font-size, border style, border color, border width, background color, padding, margin. You can check those features in above picture.

When using AI, you can ask it to fine tune these styles

- a. **The box:** width, height, margin (margin left, right, top, bottom), padding (padding left, right, top, bottom), display (as a block or inline)
- b. **Font:** font-family, font-size, color (font color),
- c. **Border:** border style, border color, border
- d. **Background:** background color

## Section 2.3 A little bit about JavaScript

JavaScript is a programming language that allows us to access any box inside a webpage. When getting access to a box, you can change anything about it, e.g., color, size, shape, or even the content.

### Access a box in a webpage

You can use the following statement to access a box.

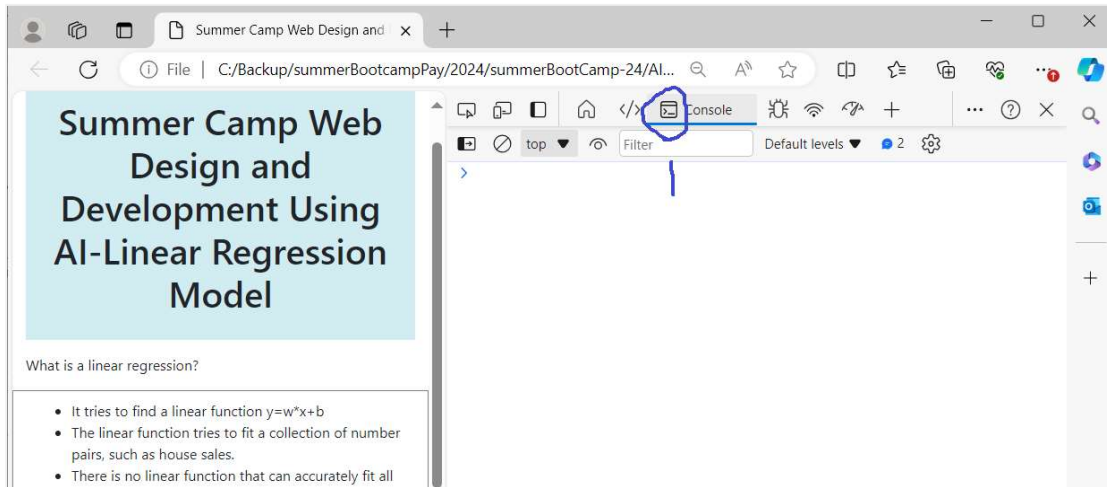
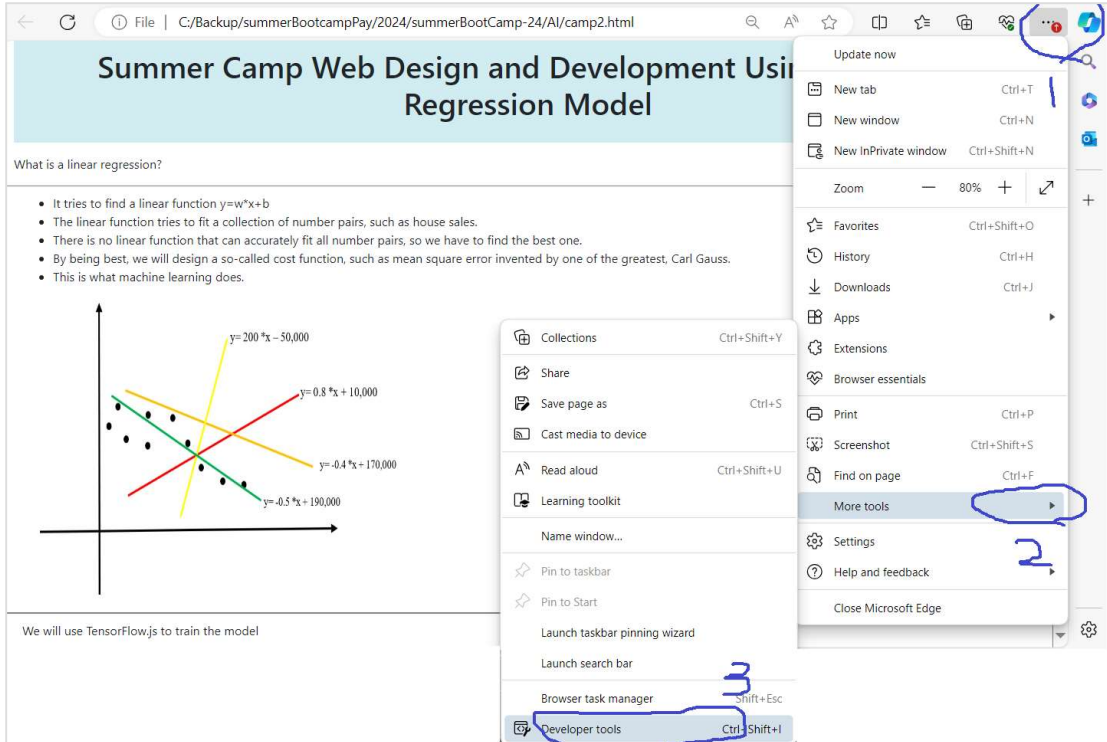
```
var box1 = document.getElementById("xxx")
```

### HTML DOM

Why “document.”? Because, your web browser will translate each box in your webpage as an object inside a tree, called “Document Of Objects”. The root of the tree is the box “<html>”. The direct children boxes such as <head>, <body> will be the child nodes of the tree. Inside <body>, if you add <header>, <main>, <footer>, they will be child nodes under <body>. And so on.

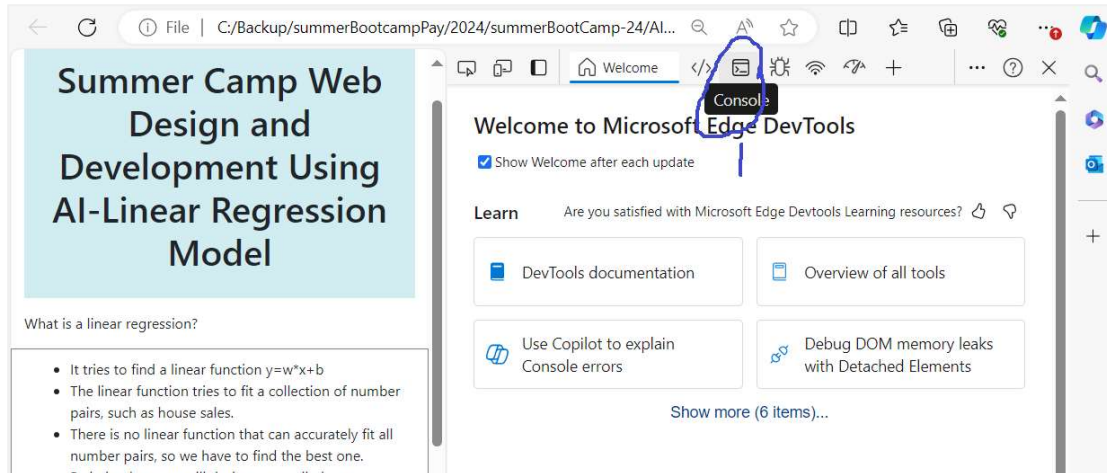
### Web browser console

Your web browser provides a place, called “console”, where it will display any errors when running JavaScript. You can follow the following steps to find the console.



If you do not see the console directly, you may follow the following picture.





## Basics of JavaScript as a programming language

As a programming language, JavaScript contains the basic elements such as

1. **Defining a variable** where you store data
2. **Operations on data:** if the data is number, then you can do  $+$ ,  $-$ ,  $*$ ,  $/$ ; If the data is string, then you can concatenate, or extract substring.
3. **Organizing data (data structure):** array, object.
4. **Operating data structures:** loop an array, `array.map`, `array.filter`.
5. **A block of coding (functions):** How to organize some coding together to do a particular job.

## AI on JavaScript

There are so many codes written in JavaScript. It is estimated that JavaScript is the most frequently used programming languages. Just imagine how many webpages have been developed. As a result, AI has been trained very well on JavaScript.

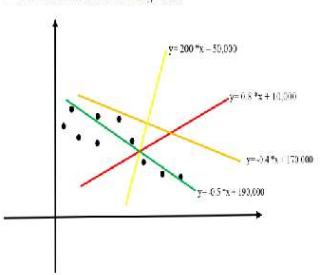
## Section 2.4 Example Using AI

Now, try the following sequence of prompts to create a webpage like this.

Summer Camp Web Design and Development Using AI-Linear Regression Model

What is a linear regression?

- It tries to find a linear function  $y=w*x+b$ .
- The linear function tries to fit a collection of number pairs, such as house sales.
- There is no linear function that can accurately fit all number pairs, so we have to find the best one.
- By being best, we will design a so-called cost function, such as mean square error invented by one of the greatest, Carl Gauss.
- This is what machine learning does.



We will use TensorFlow.js to train the model.

Please click the 'Run' below to import two JavaScript libraries

```

import('https://cdn.jsdelivr.net/npm/@tensorflow/tfjs@^4.0.0/dist/tf.min.js')
import('https://cdn.jsdelivr.net/npm/@tensorflow/tfjs-vis@1.0.0/dist/tfjs-vis.min.js')

```

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Summer Camp Web Design and Development Using AI

### Here are the prompts.

1. Create a webpage with a header that says "Summer Camp Web Design and Development Using AI-Linear Regression Model". Please use the bootstrap framework for styles.
2. Change the background color of the header to light gray.
3. Change the background color to info.
4. The header should occupy the whole width.
5. Add a main block that stretch to the whole width. Inside main, add a row, and inside that row, add a paragraph "What is a linear regression?"
6. Add another row to the main block. Inside that row, add an unordered list. The first item says "It tries to find a linear function  $y=w*x+b$ ".
7. The second list item says "The linear function tries to fit a collection of number pairs, such as house sales."
8. The third list item says, "There is no linear function that can accurately fit all number pairs, so we have to find the best one". The fourth list item says, "By being best, we will design a so-called cost function, such as mean square error invented by one of the greatest, Carl Gauss"
9. The fifth list item says "This is what machine learning does".

10. Inside the fifth list item, add the following image "linearRegression1.jpg" with width=500 and height=400.
11. Move the image to a new line.
12. Add a border to current row. The border color is gray.
13. Now, add a third row inside the main block. This new row has border too. The border color is gray. Inside the row, add a paragraph, "We will use TensorFlow.js to train the model".
14. Add another paragraph inside the third row, which says "Please click the 'Run' below to import two JavaScript libraries".
15. Now, add the fourth row inside the main block. The background color is dark. The font color is red. Inside this fourth row, please add one line of code "<script src='https://cdn.jsdelivr.net/npm/@tensorflow/tfjs@1.0.0/dist/tf.min.js'></script >".
16. Remove the fourth row inside main block.
17. Add a new fourth row inside main block. In this new fourth row, add one paragraph that says "Import <https://cdn.jsdelivr.net/npm/@tensorflow/tfjs@1.0.0/dist/tf.min.js>". Then add another paragraph that says "Import <https://cdn.jsdelivr.net/npm/@tensorflow/tfjs-vis@1.0.2/dist/tfjs-vis.umd.min.js>".
18. Add a button at the bottom of the fourth row. It displays "Run". When clicking on the button, it will load the javascript library from <https://cdn.jsdelivr.net/npm/@tensorflow/tfjs@1.0.0/dist/tf.min.js> and also from <https://cdn.jsdelivr.net/npm/@tensorflow/tfjs-vis@1.0.2/dist/tfjs-vis.umd.min.js>.
19. When click the "Run" button, display the console output as the fifth row under the fourth row.
20. Now, add a footer block under the main block. Inside the footer block, display "Copyright@ 2024, Albany State University". Go to the next line and display "Summer Camp Web Design and Development Using AI".

## Section 2.5 More Webpage Examples

You can try to use AI to create more webpage according to the following examples.

1. <https://www.backupspirit.com/camp/week1.html>
2. <https://www.backupspirit.com/camp/week2.html>
3. <https://www.asurams.edu>
4. <https://www.whitehouse.gov/>
5. [Georgia Institute of Technology \(gatech.edu\)](https://www.gatech.edu)
6. [University of Georgia: Leading Public Higher Education \(uga.edu\)](https://www.uga.edu)
7. [Home - www.caltech.edu](https://www.caltech.edu)
8. [Stanford University](https://www.stanford.edu)