Introduction to CSS

HTML is just an skeletal layout of a website. We need CSS to design a website, add styles to it and make it look beautiful.

What is CSS

CSS stands for cascading style Sheets
CSS is optional but it converts an off looking HTML page into a beautiful & responsive website

Installing VS Code

We will use Microsoft Visual Studio Code as a tool to edit our code. It is very powerful, free and customizable

Why Learn CSS?

CSS is a very demanded skill in the world of web development. If you are successfully able to master CSS, you can customize your website as per your liking.

Your first line of CSS

Create a .css file inside your directory and add it to your HTML. Add the following line to your CSS

```
body {
    background-color: red;
    }
```

This will make your page background as red.

HTML Refresher

HTML is a bunch of tags used to lay the structure of a page.

Download HTML notes as part of these notes for a detailed deepdive. If you know basic HTML, continue!

Chapter 1 - Creating our first CSS Website

We will create our first CSS website in this section.

What is DOM?

DOM stands for document object model. When a page is loaded, the browser creates a DOM of the page which is constucted as a tree of Objects.

HTML id and class attributes

When an HTML element is given an id, it serves as a unique identifier for that element.

On the other hand, when an HTML element is given a class, it now belongs to that class. More than one elements can belong to a single class but every element must have a unique id (if assigned).

We can add multiple classes to an element like this

Unique id

```
<div id="first" class="C1 C2 C3">
    ...
</div>
```

↳ multiple classes followed by spaces

Three ways to add CSS to HTML

There are 3 ways to add CSS to HTML:

1. <style> tag → Adding <style> ... </style> to HTML
2. Inline CSS → Adding CSS using style attribute
3. External CSS → Adding a Stylesheet (.css) to HTML using <link> tag

CSS Selectors

A CSS selector is used to select an HTML element(s) for styling

```
        → Selector
body {
    color : red ; → Declaration (property: value)
    background : pink ; → Declaration
 }
```

Element selector

It is used to select an element based off the tagname
for example:

```
h2 {
    color: blue;
  }
```

id selector

It is used to select an element with a given id
for example:

```
#first {          → # is used to target by id
   Color: white;
   background: black;
  }
```

Class selector

It is used to select an element with a given class
for example:

```
.red {
   background : red;
  }
```

Important Notes :

↗ We can group selectors like this :

```
h1 , h2 , h3, div {
            Color : blue ; → h1, h2, h3 and div will be
            }
```

↗ We can use element.class as a selector like this :

```
P.red {
   Color : red ;      → all paragraphs of      will get color of red
   }
```

↗ * can be used as a universal selector to select all the elements

```
* {
margin : 0 ;
padding : 0 ;
 }
```

↗ An inline style will override external and internal styles

Comments in CSS

Comments in CSS is text which is not parse and is thus ignored

Chapter 1 - Practice Set

1. Create a website with a class red div which has a background color of red and color white.

2. Create an element with id head and verify that background color works on it as inline, external as well as using style tag CSS

3. Create a CSS class one and verify that it works on multiple elements.

4. Create multiple CSS classes and verify that all of these work on the same element

5. Have a look at the MDN CSS reference and try to play around with few key-value CSS rules.

Chapter 2 - Colors & Backgrounds

CSS rules are simple key-value pairs with a selector
We can write CSS rules to change color and set backgrounds

The color property

The CSS color property can be used to set the text color inside an element

```
p {
  color: red;      → Text color will be changed to red.
  }
```

Similarly we can set color for different elements

Types of color values

Following are the most commonly used color values in CSS

1> RGB → Specify color using Red, green, blue values eg. rgb(200, 98, 70)
2> HEX code → Specify color using hex code.
eg. #ff7180
3> HSL → Specify the color using hsl values
eg: hsl(8, 90%, 63%) ↳ hue, saturation, lightness

The value of the color or background color is provided as any one of these values

Note : We also have an RGBA and an HSLA values for color but they are rarely used by beginners
A stands for alpha.

The background-color property
The CSS background-color property specifies the background color of a Container
for eg:

```
.brown {
    background-color: brown;
  }
```

→ Can be other types of Colors as well

The background-image property
Used to set an image as the background.

```
body {
   background-image: url("harry.jpg")
 }
```

The image is by default repeated in x & y directions

The background-repeat property
Can be any of:
- repeat-x → repeat in horizontal direction
- repeat-y → repeat in vertical direction
- no-repeat → image not repeat

See more possible values at MDN docs

The background-size property
Can be following:
- cover → fits & no empty space remains
- Contain → fits & image is fully visible
- auto → Display in original Size
- {{width}} → Set width & height will be set automatically

→ {{width}} {{height}} → set width & height

Note: Always check the MDN docs to dissect a given CSS property. Remember, practice will make you perfect

The background-position property
sets the starting position of a background image.

```
.div1{
 background-position: left top;
 }
```

The background-attachment property
Defines a scrollable / non-scrollable character of a background image.

```
.div2{
  background-attachment: fixed
  }
```

The background shorthand
A single property to set multiple background properties.

```
.div 3 {
   background : red url('img.png') no-repeat fixed right top;
 }
```

↓ color ↓ image ↓ repeat

One of the properties can be missing given the others are in order.

↗ {{width}} {{height}} → set width & height

Note: Always check the MDN docs to dissect a given CSS property. Remember, practice will make you perfect

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The background shorthand

A single property to set multiple background properties.

```
.div 3{
  background: red  url('img.png')  no-repeat  fixed       right top;
}               ↓       ↓              ↓          ↓          └──┬──┘
              color   image          repeat   attachment    position
```

One of the properties can be missing given the others are in order.

Chapter 2 - Practice Set

1. Create a dark blue navigation bar with light color items

2. change the color of the main container on your page to dark red.

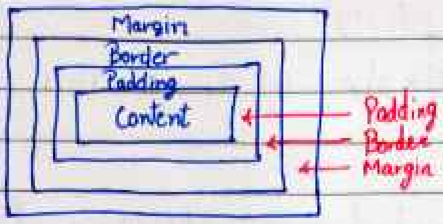
3. Create a div and add a background image with a given width and height

4. Create a vertical box and add a fixed non scrolling background to it

5. Verify that the background shorthand property works with Some of the values skipped.

Chapter 3 - CSS Box Model

The CSS box model looks at all the HTML elements as boxes


Margin
Border
Padding
Content
Padding
Border
Margin

Setting width & Height

We can set width and height in CSS as follows

```
#box {
    height : 70px;
    width : 70px;
}
```

Note that the total width/height is calculated as follows:

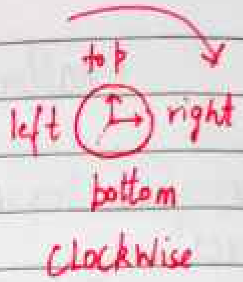
Total height = height + top/bottom padding + top/bottom border + top/bottom margin

Setting Margin & Padding

We can set margin and padding as follows:

```
.box {
    margin : 3px;
    padding : 4px;
}
```

Sets top, bottom, left & right values



```
              top   right  bottom  left
               ↓      ↓      ↓      ↓
.boxMain {
    margin : 7px   0px    2px    11px;
}
```

```
               top & bottom  left & right
                    ↑           ↑
.boxLast {
    margin :       7px         3px;
}
```

We can also set individual margins/paddings like this :

```
margin-top : 70px
margin-bottom : 3px
margin-left : 8px
margin-right : 9px
```

Same goes with padding

Setting Borders

We can set the border as follows

```
.bx {
    border-width : 2px;
    border-style : solid;
    border-color : red;
}
```

or just set border: 2px solid red;
(Shorthand)

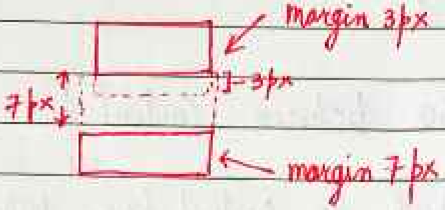
Border Radius

We can set border radius to create rounded borders

```
.div2 {
    border-radius : 7px;
}
```

Margin Collapse

When two margins from different elements overlap, the equivalent margin is the greater of the two. This is called margin collapse



→ Margin between them is collapsed to the bigger margin

Box Sizing

Determines what out of padding and border is included in elements width and height

Can be content-box or border-box

↳ Include only content in width/height

```
.div1 {
   box-sizing: border-box;
  }
```

↳ The content width and height includes content + padding + border

Chapter 3 - Practice Set

1 Create a website layout. Add a header box, 1 Content box and one footer.

2 Add borders & margins to 1

3 Did the margin collapse between Content box & footer?

4 Add the box-sizing property to Content box. What changes did you notice?

Chapter 4 - fonts & display

The display property

The CSS display property is used to determine whether an element is treated as a block/inline element & the layout used for its children.
↳ flexbox/grid/etc.

display: inline

Takes only the space required by the element. No linebreaks before and after. Setting width/height (or margin/padding) not allowed.

display: block

Takes full space available in width and leaves a newline before and after the element

display: inline-block

Similar to inline but setting height, width, margin and padding is allowed. Elements can sit next to each other

display: none vs visibility: hidden

With display: none, the element is removed from the document flow. Its space is not blocked.
With visibility: hidden, the element is hidden but its space is reserved.

text-align property

Used to set the horizontal alignment of a text

```
.div1 {
    text-align : center;
    }
```

text-decoration property

Used to decorate the text
Can be overline, line-through, underline, none

text-transform property

Used to specify uppercase and lowercase letters in a text.

```
p. uppercase {
     text-transform: uppercase;
   }
```

line-height property

used to specify the space between lines.

```
.Small {
  line-height : 0.7;
   }
```

Font

Font plays a very important role in the look and feel of a website

font-family

Font family specifies the font of a text.
Can hold multiple values as a "fallback" system

```
p {
   font-family : "Times new Roman", monospace;
}
```

↳ Always do this to ensure the correct font of your choice is rendered

Web Safe fonts

These fonts are universally installed across browsers.

How to add Google fonts

In order to use custom google fonts, go to google fonts then select a style and finally paste it to the Style.css of your page.

Other font properties

Some of the other font properties are listed below:

font-Size → Sets the Size of the font
font-style → Sets the font style
font-variant → Sets whether text is displayed in small-caps
font-weight → Sets the weight of the font

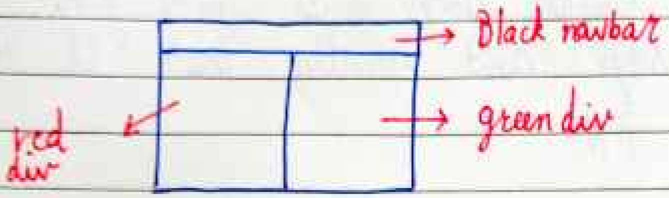
Generic families

Broad class of similar fonts eg. serif, Sans-serif
Just like when we say fruit, it can be any fruit.
When we say serif it can be any serif font.

font-family → Specific
Generic family → Generic

Chapter 4 - Practice Set

1. Create the following website layout


Black navbar
green div
red div

2. Add a footer with Google font "Ballu Bhai" to ①

3. Remove the underlines from links in ①

4. Demonstrate the difference between display: none and visibility: hidden using a div

5. Change the footer to all uppercase in ①

Chapter 5 - Size, position & Lists

There are more units for describing size other than 'px'
There are rem, em, vw, vh, percentages etc.

Whats wrong with pixels ?
Pixels (px) are relative to the viewing device.
for a device with size 1920x 1080, 1px is 1 unit out of 1080/1920.

Relative lengths
These units are relative to the other length property.
following are some of the most commonly used relative lengths

1. em → Unit relative to the parent font size
   ↳ em means "my parent element's font size"

2. rem → unit relative to the root font size (<Html> tag)

3. vw → unit relative to 1% viewport width.

4. vh → unit relative to 1% viewport height.

5. % → unit relative to the parent element

min/max-height/width property
CSS has a min-height, max-height, min-width and max-width property.
If the content is smaller than the minimum height, minimum height will be applied.

Similar is the case with other related properties

The position property

Used to manipulate the location of an element
Following are the possible values:

- static : The default position. top/bottom/left/right/z-index has no effect.
- relative : The top/bottom/left/right/z-index will now work. Otherwise the element is in the flow of document like static.
- absolute : The Element is removed from the flow & is relatively positioned to its first non-static ancestor. top/bottom etc works
- fixed : Just like absolute except the element is positioned relative to the browser window
- Sticky : The Element is positioned based on user's Scroll position

list-style property

The list style property is a shorthand for type, position & image

list-style-position

```
ul {
    list-style : square inside url('harry.jpg')
}
```

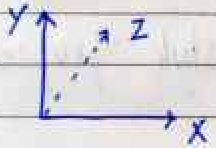
list-style-type

list-style-image

z-index property

The z-index property specifies the stack order of an element.

It defines which layer will be above which in case of overlapping elements



=> Z is the third dimension

Chapter 5 - Practice Set

1. Create a responsive navbar using relative lengths

2. Create a sticky navbar using position property

3. Demonstrate the use of list-style property using a UL as example

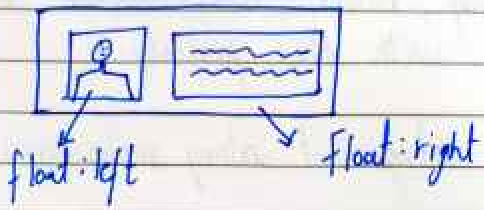
4. Demonstrate the use of z-index using an example

Chapter 6 - Flexbox

Before we look into the CSS flexbox, we will look into float and clear properties.

The float property

Float property is simple. It just flows the element towards left/right


float: left
Float: right

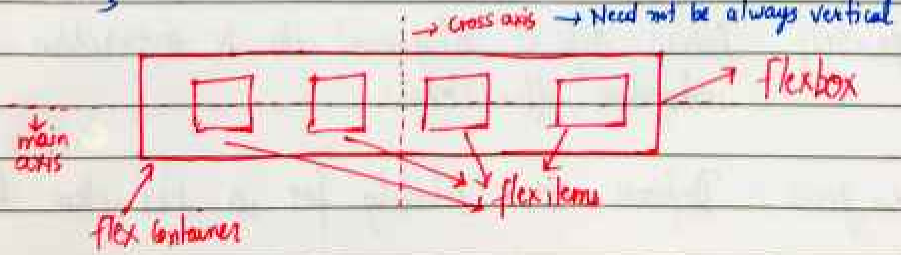
The clear property

Used to clear the float. It specifies what elements can float beside a given element

The CSS flexbox

Aims at providing a better way to layout, align and distribute space among items in a container.

```
·Container {
    display: flex;        ⇒ Initialize a flexbox
}
```


→ Cross axis → Need not be always vertical
flexbox
main axis
flex items
flex container

classmate
Date
Page

flex-direction property

Defines the direction towards which items are laid.
Can be row, row-reverse, column, column-reverse
↓
default

flex properties for parent (flex container)

following are the properties for the flex parent:

1. flex-wrap: Can be wrap, nowrap, wrap-reverse. Wrap items as needed with this property.

2. justify-content: Defines alignment along main axis.

3. align-items: Defines alignment along cross axis.

4. align-content: Aligns a flex container's lines when there is extra space in the cross axis.

flex properties for the children (flex items)

following are the properties for the flex children.

1. order: Controls the order in which the items appear in the flex container

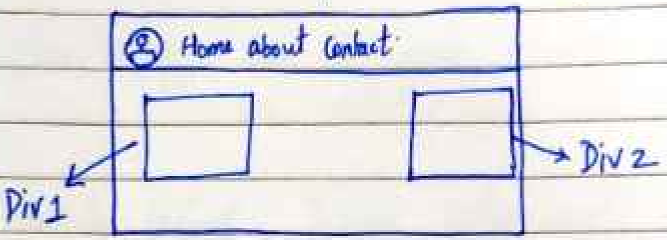
2. align-self: Allows default alignment to be overridden for the individual flex items.

3. flex-grow: Defines the ability for a flex item to grow

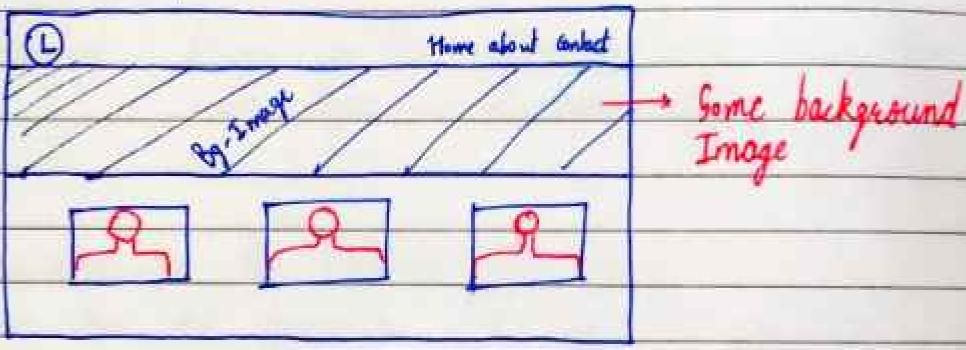
4 flex-shrink : Specifies how much a flex item will shrink relative to the rest of the flex items.

Chapter 6 - Practice Set

1. Create a layout of your choice using float.
2. Create the same layout in ① using flexbox.
3. Create the following navigation bar using flexbox


Home about Contact
Div1
Div2

4. Create the following layout using flexbox:


Home about Contact
Bg-Image
Some background Image

Chapter 7 - CSS Grid & Media Queries

A CSS grid can be initialized using :

```
.Container {
    display: grid;
 }
```

All direct children automatically becomes grid items

The grid-column-gap property
Used to adjust the space between the columns of a CSS grid

The grid-row-gap property
Used to adjust the space between the rows of a CSS grid

The grid-gap property
Shorthand property for grid-row-gap & grid-column-gap

```
.Container {
    display: grid;   ↗ row
    grid-gap: 40px 100px;
 }                      ↘ column
```

Note : For a single value of grid-gap, both row and column gaps can be set in one value.

Following are the properties for grid Container:

1> The grid-template-columns property can be used to specify the width of columns

```
. Container {
        display: grid;
        grid-template-columns: 80px 120px auto;
    }
```

2> The grid-template-rows property can be used to specify the height of each row

```
. Container {
        display: grid:
        grid-template-rows: 70px 150px;
```

3> The justify-content property is used to align the whole grid inside the container.

4> The align-content property is used to vertically align the whole grid inside the container.

Following are the properties for grid item:

1 The grid-column property defines how many columns an item will span.

```
.grid-item {
        grid-column: 1/5;
    }
```

2 The grid-row property defines how many rows an item will span.

3 We can make an item to start on column 1 and span 3 columns like this:

```
.item {
    grid-column: 1 / span 3;
  }
```

CSS Media Queries

Used to apply CSS only when a certain condition is true.

Syntax:

```
@media only screen and (max-width: 800px) {
    body {
        background: red;
      }
  }
```

Chapter 7 - Practice Set

1. Create a header with content using CSS grid.

2. Create the layouts created in Chapter 6 - Practice Set using CSS grid.

3. Create a webpage which is green on large devices, red on medium & yellow on Small devices.

Chapter 8 - Transforms, Transitions & Animations

Transforms are used to rotate, move, skew or scale elements. They are used to create a 3-D effect

The transform property

Used to apply a 2D or 3D transformation to an element

The transform-origin property

Allows to change the position of transformed elements
2D transforms → Can change x & y axis
3D transforms → Can change Z axis as well

CSS 2D transform methods

You can use the following 2-D transforms in CSS:

1> translate()
2> rotate()
3> scaleX()
4> scaleY()
5> skew()
6> matrix()
7> scale()

CSS 3D transform methods

1> rotateX()
2> rotateY()
3> rotateZ()

CSS Transitions

Used to change property values smoothly, over a given duration.

The transition property

The transition property is used to add transition in CSS.

Following are the properties used for CSS transition.

1. transition-property → The property you want to transition
2. transition-duration → Time for which you want transition to apply
3. transition-timing-function → How you want the property to transition
4. transition-delay → Specifies the delay for the transition

All these properties can be set using a single shorthand property

② duration ④ delay

transition : width 3s ease-in 2s;

① property ③ timing-function

Transitioning multiple properties

We can transition multiple properties as follows:

transition : opacity 1s ease-out 1s, transform 2s ease-in;

Yes you can skip transition delay here!

CSS Animations

Used to animate CSS properties with more control.
We can use @keyframes rule to change the animation from a given style to a new style.

```
@keyframes harry {
  from { width: 20px; } → Can change multiple properties
   to { width: 31px; }
}
```

Properties to add Animations

Following are the properties used to set animation in CSS:

1> animation-name → name of the animation

2> animation-duration → How long does the animation run?

3> animation-timing-function → Determines speed curve of the animation

4> animation-delay → Delay for the start of an animation

5> animation-iteration-count → Number of times an animation shud run

6> animation-direction → Specifies the direction of the animation

The animation shorthand

All the animation properties from 1-6 can be applied like this:

```
                ②             ④              ⑥
animation: harry 6S linear 1S infinite reverse;
            ①        ③          ⑤
```

Using percentage value states with animation

We can use % values to indicate what should happen when a certain percent of animation is completed

```
@ keyframes harry {
  0% {
       width: 20px;
     }
  50% {
       width: 80px;
      }
  100% {
       with: 200px;
       }
   }
```

⇒ Can add as many intermediate properties as possible

Chapter 8 - Practice Set

1 Create a thin progress bar animation for a Website

2 Create the same progress bar using transition

3 Create a rotating image animation using CSS

4 Create a slider with 3 images using CSS.

Project 1 - E Commerce Website

Create a homepage for an E-Commerce website
Use media Queries to make it responsive