

# CSS

## Anatomy of CSS Rule.

<style>

selector  $\Rightarrow$  tag to which style is to apply, here it is paragraph, head line

p {

color : blue ;

font-size : 200px ;

}

↑

Properties

↑

Values

} Declarations which property and value separated by semicolon. [ ; ] is not complete

h1 {

color : green ;

text-align : center ;

}

</style>

whole is stylesheet,

Page No: \_\_\_\_\_  
Date: \_\_\_\_\_

# Selectors - Used to HTML element to which we want to style.

1) Element selector - selector which uses tag name as a selector for styling.

```
p {  
  color: blue;  
}
```

```
<p> ---- <p>  
<p> ---- <p>
```

↑  
every paragraph is blue

2) Class selector - we define selector as a class with .classname selector and this class is assigned to required tags. many classes can be assigned one element as class="Blue Red"

```
.Blue {  
  colour: blue;  
}
```

```
<p class="Blue" > ----  
<p class="Blue" > ----  
<p> ---- <p>  
↑  
unaffected. Blue text
```

3) id selector

```
#name {  
  color: blue;  
}
```

```
<p> ---- </p>  
<div id="name"> ---- </div>
```

Here id is given to div element from that id div element to which style is to be applied is identified and inside `<style>` we use id with # and assigned style to it.

## Combining Selectors

### 1) Element with class selector.

P. big {

font-size = 20px;  
 }

<P class = big > --- </P>

<div class = big > --- </div>

space

only p elements with given class are affected  
 others are unaffected.

### 2) child selector

every p of article which is direct child gets  
 the style.

article > P {  
 color : blue;  
 }

color : blue;

<article>

<P> --- </P>

<P> --- </P>

</article>

But p should be direct child.

### 3) Descendant selectors

article P {  
 color = blue;  
 }

color = blue;

<article>

<P> --- </P>

<div> <P> --- </div>

</article>

Every p element inside article element irrespective  
 of whether it is direct element or not gets  
 that style.

## Various selector combinations

```
.colored p {
    color: blue;
}
```

every element inside elements with class colored gets style

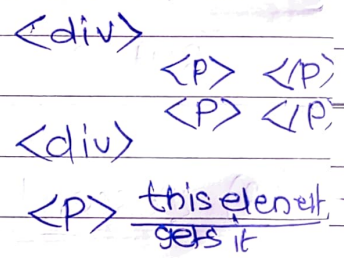
```
article > .colored {
    color: blue;
}
```

every element having class colored and inside article and direct child gets style.

## Adjacent Sibling Selector

```
div + p {
    background-color: yellow;
}
```

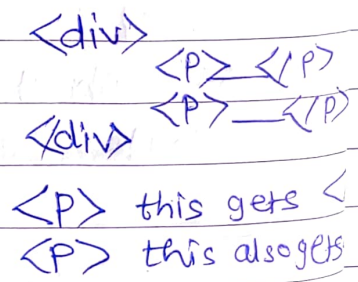
adjacent sibling is element next to element at same



## General Sibling Selector

```
div ~ p {
    background-color: yellow;
}
```

All the siblings given element.



# Pseudo-Class Selectors

```
selector : Pseudo-class {  
Property: value;  
}
```

selector are chosen according to rule studied and pseudo-classes classes can be as follows-

1) link - If element is a link

2) visited - If element visited

3) hover - If mouse hovers over

4) active - If mouse click on it but not released

5) nth-child(x) - Particular level of child's of element selected.

```
e.g. 1) a : hover {  
color : red;  
}
```

hovering over link in a gives red colour to it.

```
2) p : hover, a : active {  
color : red;  
}
```

hovering over paragraph and clicking on link changes them to red.

# CSS Pseudo-Elements

CSS pseudo-element is used to style specified parts of an element.

for e.g.

- 1) style the first letter, or letter of an element
- 2) insert content before or after the content of element.

```
selector :: pseudo-element {  
    Property: value;  
}
```

1) first-line - it styles first line of element only.

```
p :: first-line {  
}
```

2) first-letter - it styles first letter of element

```
p :: first-letter {  
}
```

3) before - it is used to insert something before element like emoji with content property

```
p :: before {  
    content: url(smiley.gif);  
}
```

4) after - used insert after content of element

5) selection - when element content is selected by user.

```
p :: selection {  
    color: red;  
    background: yellow;  
}
```

## Attribute selectors

Used to style Elements having specific attribute.

### Syntax

```
Element [attribute = "value"] {
  ...
}
```

e.g.

```
a [target = "_blank"] {
  background-color: yellow;
}
```

It styles link having blank as target attributes with background color yellow.

### Other formats

1) element [attribute = "value"]  
 Attribute with specific value.

2) element [attribute ~ "value"]  
 [title ~ "flower"]  
 when flower is one word inside title

3) element [attribute |= "value"]  
 [title |= "flower"]  
 when title start with space separated / (-) separated flower word

4) element [attribute ^= "value"]  
 [title ^= "flower"]  
 when title start with flower word flower may not be separated like floweroflath

5) element [ title \*= "flower" ]  
[ title \*= "flower" ]

when flower word occurred somewhere like in in but may not be separated by space or (-) like myflower is is title.

\* Attribute selector is most useful for using CSS for forms.



## Style placement.

1) style can placed in Elements, (Inline style)

`<element style = "Property : Value;" >-----</P>`

for e.g. -

`<P style = "text-align : center;" >-----</P>`

this method is least used because it is least reusable.

2) External style

`<head>`

`<link rel = "stylesheet" href = "style.css" >`

`</head>`

`style.css`

`body {`

`background-color : grey;`

`font size : 130%;`

`}`

In this method external styling sheet is used and its reference is given with link this method is used in real world application. It is usefull when there are lots of pages to style as peritcular way.

### 3) Head styles - style with <style> tag (Internal)

```
<head>
```

```
<style>
```

```
  p {
```

```
    color : maroon;
```

```
  }
```

```
</style>
```

```
</head>
```

Head style is used while overriding the external styles in real world application.

# CSS colors

## Properties and values

### 1) Property

- i) color
- ii) background-color
- iii) border
- iv) opacity

### 2) Value

#### RGB & RGBA

1)  $rgb(R, G, B)$

$R, G, B$  ranges  $\{0-255\}$

2)  $rgba(R, G, B, \alpha)$

$\alpha$  ranges  $\{0-1\}$

### HEXADECIMAL-HEX

#000000

to

#ffffff

first, second and third "00" are for R, G, B respectively

### HSL - HUE, SATURATION, LIGHT

1)  $hsl(h, s\%, l\%)$

h - hue - color wheel 0 is red, 120 is green, 240 is blue.

Saturation - degree of grey shade 0% is grey 100% is full color.

light - Degree of light from 0% to 100%.

2)  $hsla(h, s\%, l\%, \alpha)$  -  $\alpha$  ranges  $[0-1]$

# Background

## I) Background color

i) background-color : i) "color name" ;

ii) rgb(r, g, b) ;

iii) rgba(r, g, b, a) ;

iv) hsl(h, s, l) ;

v) hsla(h, s, l, a) ;

vi) #000000 ;

ii) opacity

: (0-1) ;

## II) Background image

i) background-image : url("url-format") ;

ii) background-repeat : repeat ;

no-repeat ;

repeat-x ;

repeat-y ;

iii) background-position : right top ; right bottom ; right

inherit ;

(x% y%) ;

(xpx, ypx) ;

left top ; left bottom ; left

right center ; left center ;

top center ; bottom center ;

## III) Background Attachment

i) background-attachment : scroll ; - background image scroll

fixed ; background image fixed

IV) Background Shorthand - This property used to specify a background property in single line.

i) background : rgb(R, G, B)

url(" ")

repeat

scroll

50% 50% ;

Any property of shorthand sequence can be missing but sequence should be same.

- i) color
- ii) image
- iii) repeat
- iv) attachment
- v) position

Opacity property can be used with images, text etc so that image transparency can be controlled. It is also set with the help of background-color property with opacity attribute ( $\alpha$ )

### IV) Background shadow

i) `text-shadow: 2px 2px 2px rgba(R,G,B, $\alpha$ );`

↑                    ↑                    ↑                    ↑  
 Horizontal        Vertical        Blur                color

Horizontal    Vertical

can be negative for upward or left side

ii) `box-shadow: 2px 2px 2px rgba(R,G,B, $\alpha$ )`

Used for shadow of whole box containing element.

# CSS Borders

## Border style

i) `border-style` : dotted; groove; inset; solid;  
dashed; ridge; outset; double;

ii) `border-style` : dotted solid ridge dashed;  
upper right bottom left,

iii) `border-style` ; dotted solid ridge ;  
upper left right bottom;

iv) `border-style` ; dotted solid ;  
upper bottom right left.

## Border width

i) `border-width` : medium;  
thick ;  
x px ;

ii) `border-width` : xpx ypx zpx medium/thick ;  
top right ~~left~~ bottom left.

iii) `border-width` : xpx ypx ;  
top bottom

## Border color

i) `border-color` ; color ; hsl(h,s,l,a);  
rgb(R,G,B); rgba(R,G,B,A);  
#ffffff;

## Border sides

`border-top-style` : styles

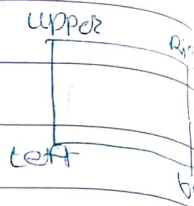
`border-right-style` : styles

`border-bottom-style` : styles

`border-left-style` : styles

## Border Radius

- i) `border-radius` : 15px 15px 15px 15px ;  
                           upper right bottom left
- ii) `border-radius` : 15px 15px 15px ;  
                           upper right left bottom
- iii) `border-radius` : 15px 15px ;  
                           upper bottom right left
- iv) `border-radius` : 15px ;  
                           all



- v) `border-top-left-radius` : 2em ;
- vi) `border-top-right-radius` : 1 ;
- vii) `border-bottom-left-radius` : 50% ;
- viii) `border-bottom-right-radius` : 5px ;

## Border Shorthand Property

`border` : 6px solid red ;

### Order of values

- i) width
- ii) style (compulsory)
- iii) color

## CSS outlines

outline is used to making element stand out by a it outside borders with some spacing.

It has all the properties same as borders.

only one different property as follows:

`outline-offset` : 2px ;

# CSS Margins, Padding & Height, Widths

## Margins

margin : auto; // browser calculates  
x px; // length  
x em; // length  
x %; // % width

margin-top : auto;

margin-bottom : x px;

margin-right : x em;

margin-left : x %;

margin : x px, y px, z px, a px ;  
          upper right bottom left

margin : x px, y px, z px ;  
          upper right left bottom

margin : x px, y px  
          upper bottom left right

margin : x px  
          all

## Padding

Same as that of margin.

## Height & width

i) height : auto; x px; x em; x %; inherit; initial;

ii) width : auto; x px; x em; x %; inherit; initial;

auto - default value, browser calculate height width

x px - length

x em - length

x % - % of box containing it.

inherit - sets value to default.

initial - parent's value.



i) min-width: 2px; 2em; 2%; auto; inherit; initial;  
ii) max-width: 2px; 2em; 2%; auto; inherit; initial;  
iii) min-height: 2px; 2em; 2%; auto; inherit; initial;  
iv) max-height: 2px; 2em; 2%; auto; inherit; initial;

max-min property used when resizing is concern  
browsers.

# CSS Text

Text have properties like -

## Text color

color : "color" ; rgb(R,G,B) ; rgba(R,G,B,α) ; #000000, hsl()

background-color : "color" ; rgb(R,G,B) , rgba(R,G,B,α) ; #000000, hsl()

## Text Alignment

text-align : justify ; // every line stretched to same width.  
right ; left ; center

vertical-align : top ;  
middle ;  
bottom ;

## Text decoration

text-decoration : overline ; underline ; line-through ;  
text which is not link should not be underline it creates confusion.

## Text transform

text-transform : uppercase ;  
lowercase ;  
capitalize ;

## Text spacing

text-spacing  
letter-spacing  
word-spacing  
line-height

## Text shadow

text-shadow : 2px 4px 2px "colour" ;  
Horizontal vertical blur colour ;

## CSS Fonts

Font family - It used for multiple fonts when first font is not supported then next font selected as per compatibility of browser.

- i) If font name is more than one word then " " commas are used to quote them.
- ii) To start with font we want we make it a class name.

e.g.

```
.serif {
    font-family : "Times New Roman", Times, serif;
}
```

## Font style

```
font-style : normal;
            italic;
            oblique;
```

## Font Weight

```
font-weight : normal;
             bold;
             900;
```

Boldness level [100-900]  
 in multiple of hundred

## Font size

```
font-size : x px;           // x px
           x em;           // x is relative to parent
           x vw;           // x is default and vw for 100%
```

Font Google - The link of google fonts inserted and then font family is used.

```
<link rel="stylesheet" href="https://fonts.googleapis.com/css?family=Sofia">
```

```
font-family: "Sofia";
```

### Font Property Shorthand

```
font: italic;  
      small caps;  
      bold;  
      12px;  
      Georgia, serif;
```

#### Sequence

font-style

font-variant

font-weight

font-size (Required)

font-family (Required)

## CSS links

CSS properties for links are same as we applied text or blocks but other than this we need a properties according to activities of mouse.

```
a: link { // unvisited link
```

style for event

```
}
```

```
a: hover { // hover over
```

style for event

```
}
```

```
a: visited { // visited link
```

style for event  
 text-decoration: none;

```
}
```

```
a: active { // clicked link
```

style for event

```
}
```

# CSS Lists

## unordered list

```
ul {  
  list-style-type: circle ;  
                 square ;  
}  
  
list-style-image : url ('image.png');
```

## Ordered list

```
ol {  
  list-style-type : upper-roman ;  
                  lower-roman ;  
                  upper-alpha ;  
                  lower-alpha ;  
}
```

## Style position

```
li {  
  list-style-position : outside ;  
                    inside ;  
}
```

list have certain margin/paddings.

we can remove bullet point by setting style to none

```
list-style-type : none ;  
margin : 2px ;  
padding : 2px ;
```

# CSS Tables

We can define borders, background colors text colors, events of mouse etc to table and tr, th, td etc.

```
table, th, td {  
    border-collapse: collapse;  
    border: 1px solid black;  
}
```

## Properties for table, th, td, tr

- i) border: 1px, solid, black;
- ii) border-bottom: 1px, ridge, red;
- iii) border-collapse: collapse; no-collapse;
- iv) width: 2px;
- v) height: 2px;
- vi) text-align: left; Right;
- vii) padding: 2px;
- viii) vertical-align: upper; bottom;
- ix) color: "color"
- x) background-color: "colour"

CSS Layout - overflow - It decides how content that unfits into box is handled.

- i) overflow : visible - overflow not clipped
- hidden - overflow hidden
- scroll - overflow handled with scrollbar completely
- auto - ~~at~~ scrollbar only when necessary.

- ii) overflow-x
- iii) overflow-y

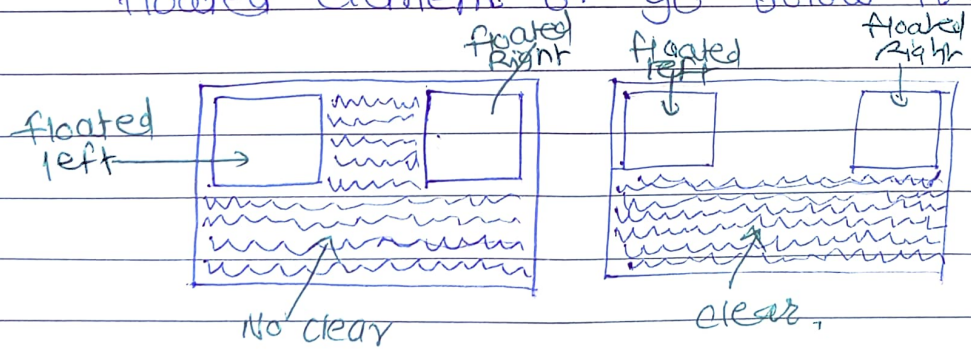
// To handle overflow in x or y directions only.

float: left; clear: both;

CSS Layout - float & clear

float - specify how element should float, i.e. the property for positioning and formatting content inside of container.

clear - It is used after the float property to decide wheather element should be on next to finally floated element or go below it.



- i) float : right;
- left;
- none;
- inherit;

- ii) clear : right; // No floating element on right side
- left; // No floating element on left side
- both; // No floating element on either sides
- none; // floating element on either side allowed
- inherit; // inherit



## CSS Display - override element's inline or block property.

display : inline;  
          block;  
          inline-block;

visibility : hidden; // element affects layout but is hidden.

## CSS Position

The position property specifies the type of position method used for an element (static, relative, fixed, absolute or sticky)

### Static

# Conflict Resolution

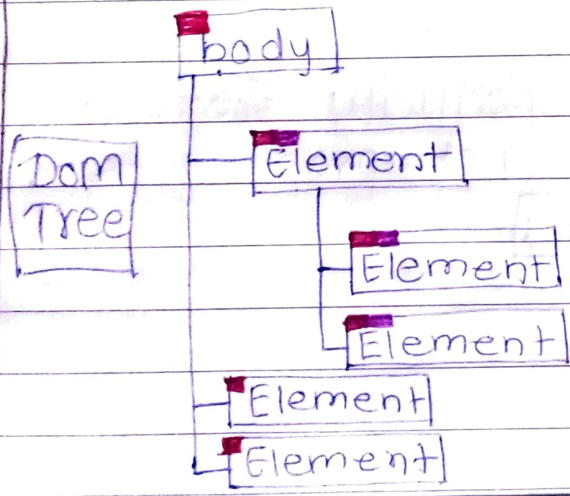
1) When there is conflict between two declaration we follow the rule - "Last declaration wins" because HTML follows top to bottom approach.

When external <sup>style</sup> declarations have conflicts they follow the same rule as per the position of declaration as most of time <link> declared at head (top).

2) When there is no conflict it follows rule - "Both declaration merged"

## Inheritance

Any property given to parent element is also inherited by child element like properties & inherited.



3) specificity - Most specific Selector Combination win

To find the specificity we use specificity score

style = " "	ID	class pseudo class attribute	# of Elements
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

div #my para {

color : blue;  
}

div.big p {

color : green;  
}

style=" "	ID	class	#Elem
0	1	0	1

Score = 101

style=	ID	class	#Elem
0	0	1	2

score = 12

according to scores paragraph gets blue color.

### Overriding the specificity rules.

When declare the style with **!important** tag it overrides all of rules of cascading and use the same property declared with **!important** tag eg. above example will show green color irrespective of their specificity score if we add important tag after property as -

**color : green !important ;**

## CSS Text Styling -

**font-family** - It gives different font choices for user's browser from which browser selected font which it supports.

e.g. **font-family** : Ariel, Helvetica, sans-serif;

**Color** - It allows to set colors either by name or by RGB formats in hexadecimal no. followed after #, or `rgba(0,0,0,0)` a for transparency.

e.g. **color** : # 00 00 ff ;  
Red green Blue

**font-style** - It gives options like  
i) Normal      iii) italic  
ii) oblique    iv) inherit

e.g. **font-style** : italic;

**font-weight** - It gives boldness by assigning the word value **Bold** or numbers from `[100, 200, 300, ..., 900]`

e.g. **font-weight** : 900;

**font-size** - The default is `[16px]` for most of browsers we can set it with `[px]` declaration or `[%]` of default.

eg **font-size** : 24px;

But font sizes changes according to user make it zoom in or zoom out So keep everything relative to each other we style font size with relative styling method as follow.

```
body {
  font-size : 120% ;
}
```

Now when we want to change the style of font size we redeclare without overriding original but relative to it, as.

```
<P style = "font-size = 2em" > - - - </P>
```

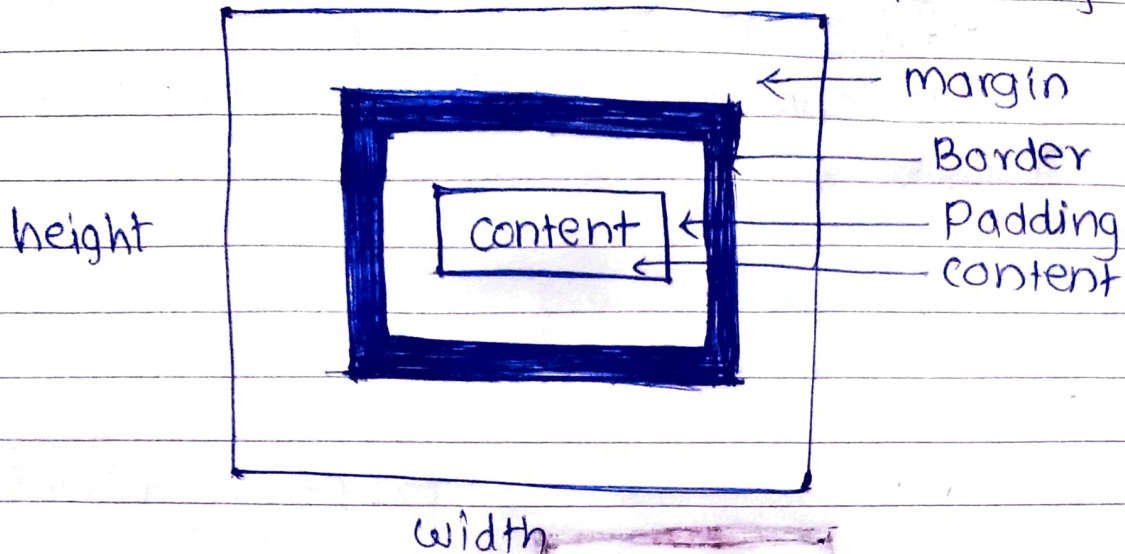
2em, 3em, 4em or 0.1em, 0.2em gives font size of double, triple - - - - - respective to parent font size which we set to 120% initially. As body is direct parent of <P>

### Text Effects

```
P {
  text-overflow : clip ; ⇒ [shubham saw]
  ellipsis ; ⇒ [shubham saw]
  word-break : keep-all ; ⇒ Break only at space
  break-all ; ⇒ Break at any character
  word-wrap : break-word ⇒ It break word if not fitted in box
  writing-mode : horizontal-tb ; ⇒ write horizontally
  vertical-rl ; ⇒ write vertically
}
```

# Box Model

The Box is the wrapper that wraps every html element



$$\text{width} = \text{width} + 2 \times \text{Border} + 2 \times \text{Padding} + 2 \times \text{margin}$$
$$\text{height} = \text{height} + 2 \times \text{Border} + 2 \times \text{padding} + 2 \times \text{margin}$$

<style>

```
body {  
  background-color : grey;  
  margin : 0;  
  padding : 0;  
}
```

#box {

```
  background color : green;  
  padding : 10px, 10px, 10px, 10px // (T,R,B,L)  
  border : 5px solid black;  
  margin : 40px;  
  width : 30px;  
  height : 10px;
```

#content {

```
  background-color : violet;  
}
```

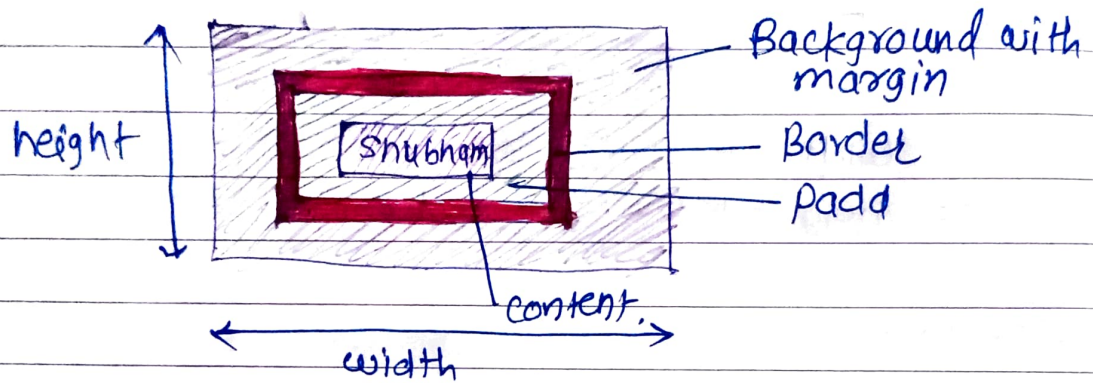
</style>

```

<div id = "Box">
  <div id = "content"> Shubham </div>
</div>

```

output



width = 30 + 5 + 5 + 10 + 10 = 60 px  
 height = 10 + 5 + 5 + 10 + 10 = 40 px

The width is always addition of all element inside element content, border and pad as box is defined to content but it can be changed. using property box-sizing: border-box; inside that element styling or to parent like body, or \*Selector for all the element.

```

* {
  box-sizing: border-box; // for all elements
}

```

```

body {
  box-sizing: border-box; // for child elements
}

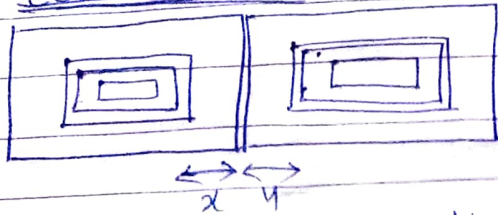
```

```

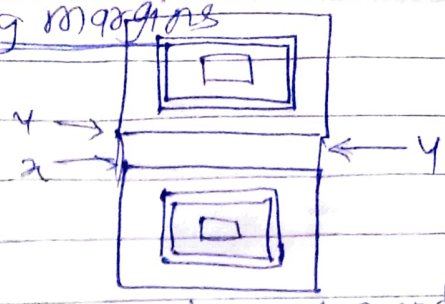
p {
  box-sizing: border-box; // for specific element
}

```

Commulative and collapsing margins



margins on same line  
 get commulated hence  
Net margin =  $x+y$

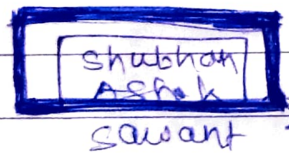


margin on top and below  
 boxes are merged with  
 biggest margin  $\therefore y > x$   
margin =  $y$

overflow property

overflow - when box size is set to very low with height and width and texts inside are overflowing outside the boxes then we use this command overflow to handle the situation.

- overflow: visible - Default it cause text to overflow out
- hidden - It hides the text that don't fit inside
- auto - It provide scrollbar whenever neces.
- scroll - It always provides two scrollbar even when not required.



overflow



# CSS forms

We use CSS forms to style the form element like input with different formats.

## 1) Input field

```
input {  
    width : 50%;  
    padding : 12px 20px;  
    margin : 8px 0;  
    box-sizing : border-box;  
    border : 2px solid red;  
    border-radius : 4px;  
    color : black;  
    background-color : white;
```

## 2) Input field with specific type

To style specific type of input.

```
input [type = text] {  
    }  
input [type = password] {  
    }  
input [type = number] {  
    }  
also button, submit, reset  
etc.
```

## 3) Focused inputs

To change the style when it gets focused (clicked) we use `[focus]` selector for doing so.

```
input [type = text] : focus {  
    background-color : lightblue;  
}
```

#### 4) Input with icon/image

If we want icon inside the input use the background properties.

```
input [type=text] {
```

```
background-color: white;  
background-image: url('searchicon.png');  
background-position: 10px 10px;  
background-repeat: no-repeat;  
padding-left: 40px;
```

```
}
```

#### 5) Animated search input

use transition focused properties to animate input when focused.

```
input [type=text] {
```

```
transition: width 0.4s ease-in-out;  
width: 50%;  
padding: 4px;  
background-color: white;
```

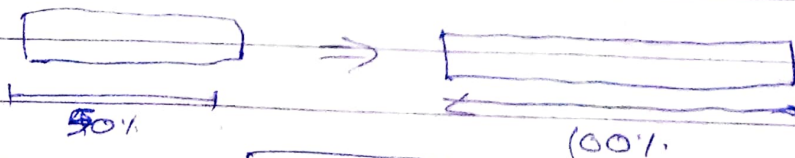
```
}
```

```
input [type=text] : focus {
```

```
width: 100%;
```

```
}
```

#### output



in 0.4s

#### 6) Text areas input - use resize property to allow whether text areas should be resizable or not.

~~text area~~  
text area {  
    resize: none;  
    width: 100%;  
    height: 50%;  
}

## Select menus

```
select {  
    width: 100%;  
    height: 20px;  
    border: none;  
}
```

# CSS Animation

1) CSS @keyframes Rule - @keyframes defines animation from changing one CSS style to other CSS style gradually with defined % selectors or from to selectors as follows -

0% start
10%
50%
100% end

from (same as 0%)
to (same as 100%)

## Syntax

```
@keyframes animationname {  
    keyframe selector { CSS-style }  
}
```

2) animation-name - used to apply animation with @keyframes to CSS block in which its specified.

```
animation-name : name of animation ;
```

3) animation duration - duration in seconds.

```
animation-duration : 4s ;
```

4) animation-delay - delay to start animation in seconds.

```
animation-delay : 2s ;
```

5) animation-iteration-count - number of times an animation repeats.

```
animation-iteration-count: 3;
```

we can set to infinite for forever run of an animation.

6) animation-direction - The direction in which an animation is to play.

```
animation-direction: normal  
: reverse  
: alternate - forward  
: alternate-reverse - backward
```

7) animation-timing-function - defines animation speed curve

```
animation-timing-function: ease // start and end slow  
: linear // same constant speed  
: ease-in // slow start  
: ease-out // slow end  
: ease-in-out // slow start & end  
: cubic-bezier(n,n,n,n) // defined by 4 control points
```

8) animation-fill-mode - style of element when animation is not playing

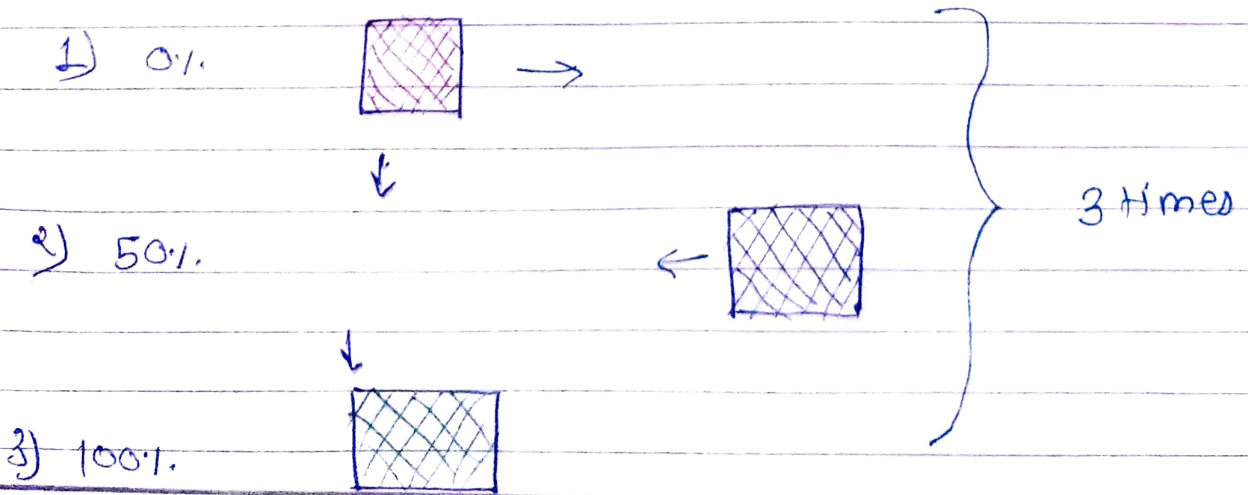
```
animation-fill-mode: none // no style before or after  
: forward // keeps last keyframe  
: backward // keeps first keyframe  
: both // extend property values to  
forward & backward
```

```
div {
    width : 100px ;
    height : 100px ;
    background-color : red ;
    position : relative ;
    animation-name : example ;
    animation-duration : 4s ;
    animation-iteration-count : 3 ;
    animation-direction : alternate ;
    animation-delay : 2s ;
    animation-timing-function : ease
    animation-fill-mode : forwards
}
```

@keyframes example {

```
0% { background-color : red ; left : 0px ; top : 0px ; }
50% { background-color : blue ; left : 200px ; top : 100px ; }
100% { background-color : green ; left : 0px ; top : 0px ; }
```

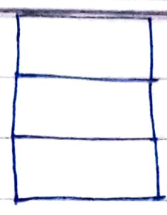
Output



# CSS Navigation bar

Navigation bar is a kind of list of URLs.  
 It has base of html list elements and there are two kinds of Navigation bars.

## 1) Vertical Navigation bar



Vertical NavBar

```
ul {
    list-style-type : none; // order style of list
    width : 50%; // width of Navigation bar
    background-color : #f1f1f1; // background color
    height : 50%; // height of Navigation bar
    position : fixed; // Position of Navigation bar with respect to webpage wheather it should be fixed or move with page scroll.
    overflow : auto; // overflow defines what should happen with unfitted elements of block. (Tabs of Nav bar)
```

```
li a {
    display : block; // to make block elements
    color : #000000; // color of text of tab
```

```
li {
    text-align : center; // text aligns in tab
```

```
li a :hover {
    background-color : #555; // background color when hovered over tab.
    color : white; // color of text when hover.
```

```
li a :active {
    background-color : #CAE50;
    color : white;
```



## Horizontal Nav Bar

### 2) Horizontal Navigation bar

use `display: block` to make whole area clickable  
`float: left` to float blocks  
`position: fixed` to fix navigation bar on page.

```
li {  
    float: left;  
    position: fixed;  
}
```

```
li a {  
    display: block;  
    color: white;  
    text-align: center;  
    padding: 14px 16px;  
    text-decoration: none;  
}
```

```
li a: hover {  
    background-color: #111;  
}
```

```
.active {  
    background-color: #4CAF50;  
}
```

To make tabs divider in navigation bar use property `border-right`, `border-bottom` etc.



# CSS Grid

CSS grid used for defining elements like keypad. when `div` elements are declared inside `div` element then outer `div` is grid-container and inside `div` are grid elements/items.

`.grid-container {`

`display: grid;`

`grid-column-gap: 2px;`

`grid-row-gap: 3px;`

`// grid-gap: 2px 3px;`

`grid-template-columns: auto 30px auto;`

`grid-template-rows: auto 30px auto;`

no of element defined defines column, row numbers auto is undefined size and size can be given. here 3x3 created.

`.grid-container > div {`

`background-color: green;`

`text-align: center;`

`font-size: 20px;`

`}`

`<div class = "grid-container`

`<div> 1 </div>`

`<div> 2 </div>`

`<div> 3 </div>`

`<div> 4 </div>`

`<div> 5 </div>`

`<div> 6 </div>`

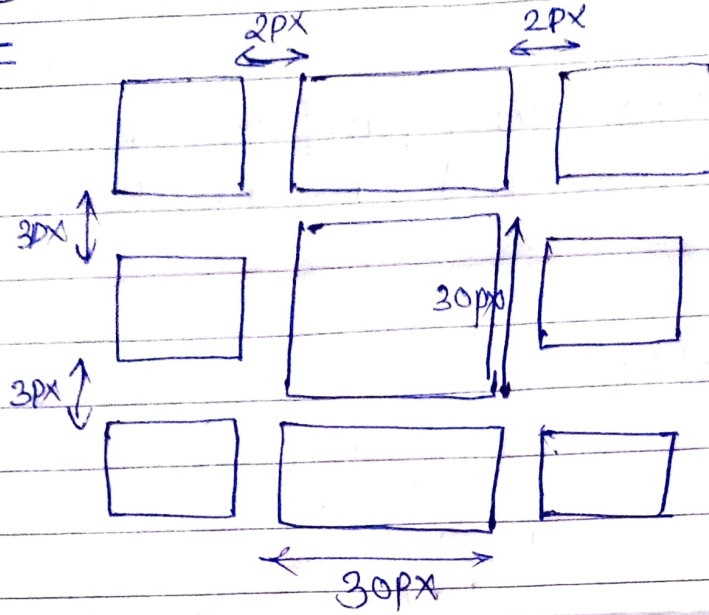
`<div> 7 </div>`

`<div> 8 </div>`

`<div> 9 </div>`

`</div>`

output



# CSS transitions

CSS transition allows you to change property value smoothly over given time duration.

We define transitions with two selector blocks CSS one have property transition and one have pseudo-selector and properties to change as mentioned in transition-name.

```
div {
  width : 100px;
  height : 100px;
  background-color : red;
  transition-property : width height;
  transition-delay : 2s;
  transition-duration : 4s;
  transition-timing-function : ease;
}
```

```
div :hover {
  width : 200px;
  height : 200px;
}
```

As here hover over div may change the CSS property as per selectors and CSS blocks but transition only helps us to transform CSS properties with defined ways.

- transition-property - properties to apply transitions
- transition-timing-function : ease; linear;  
 ease-in; cubic-bezier(nnn)  
 ease-out;  
 ease-in-out;

# CSS Units

## Absolute lengths

cm - centimeter  
mm - millimeter

in - inch  
PX - pixels

Pt - points  
pc - picas

eg. 20px, 20cm, 20mm

pixels are relative to viewing device screen  
for low-dpi-device one pixel is 1 device pixels  
for high-dpi-device one pixel is multiple pixels.

Absolute lengths are not recommended to use.

Relative lengths - It specify length relative to another length property. It is recommended method.

em - (2em means 2 times current font)

ex - relative to x-height of current font.

ch - relative to 0 width (zero's width)

rem - relative to font size of root element

VW - relative to 1% of width of viewport

Vh - relative to 1% of height of viewport

Vmin - relative to 1% viewport's smaller dimension

Vmax - relative to 1% viewport's larger dimension

% - relative to parent element