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#RahoAmbitious

Full Stack Software Development

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Course: Introduction to Web Development

Lecture On: CSS Box Model

Instructor: Siddhesh Prabhugaonkar

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In the last class, we discussed...

- Introduction to CSS
- How to add CSS and style your website
- CSS height, width and units
- CSS colors
- CSS background

Poll 1 (15 Sec)

How will you target all the elements with h2 and h3 tags to have the same styling?

1. * { }
2. #h2, #h3 { }
3. h2, h3 { }
4. All of the above

Poll 1 (Answer)

How will you target all the elements with h2 and h3 tags to have the same styling?

1. * { }
2. #h2, #h3 { }
3. **h2, h3 { }**
4. All of the above

Poll 2 (15 Sec)

Which of the following is the correct HTML syntax to specify an external stylesheet?

1. <stylesheet>style.css</stylesheet>
2. <style src="style.css></style>
3. <link rel="stylesheet" href="style.css" />
4. <link rel="stylesheet" src="style.css"/>

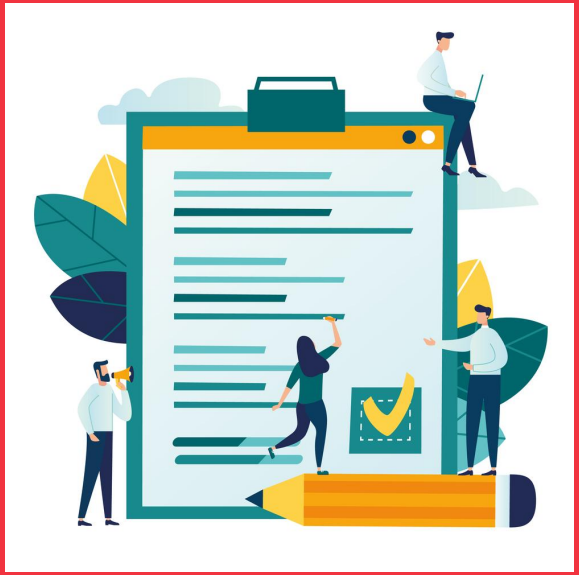
Poll 2 (Answer)

Which of the following is the correct HTML syntax to specify an external stylesheet?

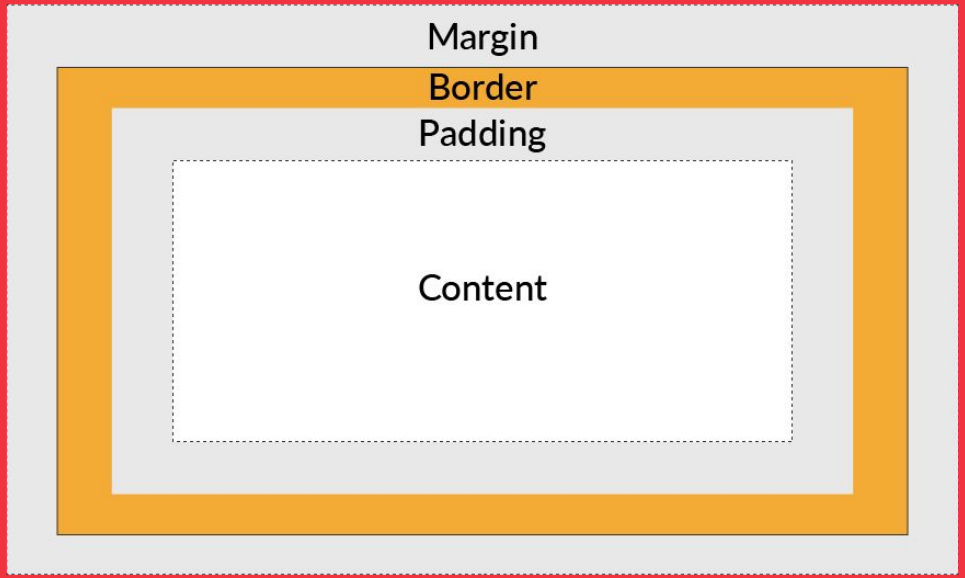
1. <stylesheet>style.css</stylesheet>
2. <style src="style.css></style>
3. **<link rel="stylesheet" href="style.css" />**
4. <link rel="stylesheet" src="style.css"/>

Today's Agenda

- CSS Box Model



CSS Box Model



CSS Box Model

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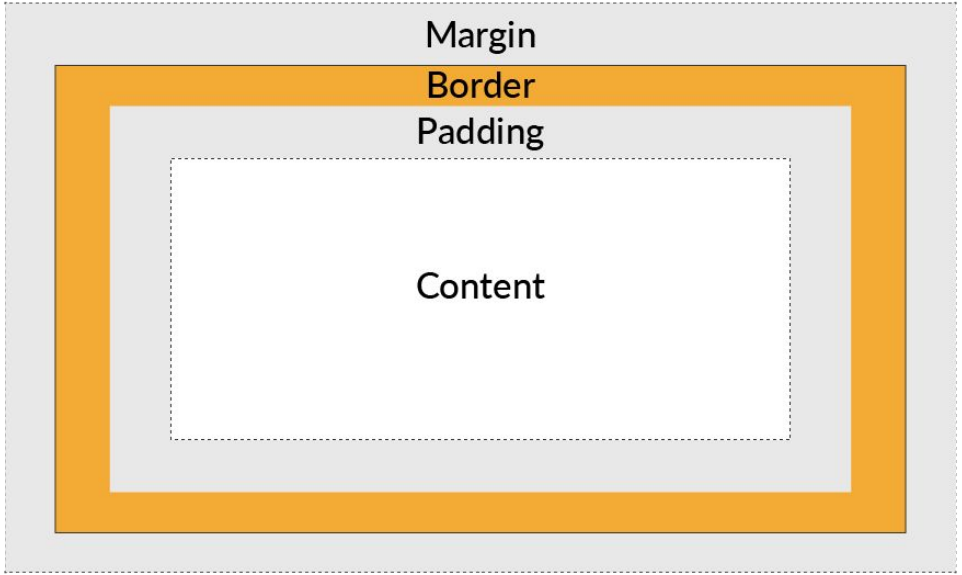
The box model consists of four things:

- Content
- Padding
- Border
- Margin



CSS Box Model

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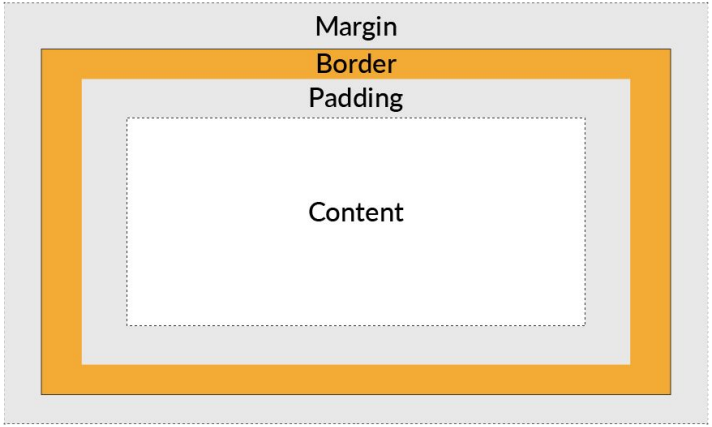
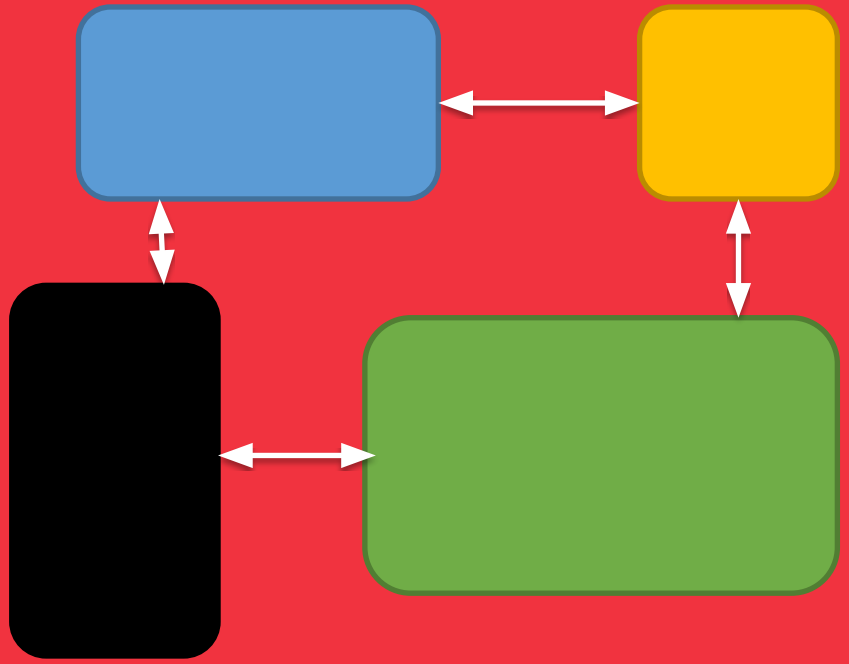
The CSS box model is a box that surrounds every HTML element. It comprises the following: **content + padding + border + margin.**



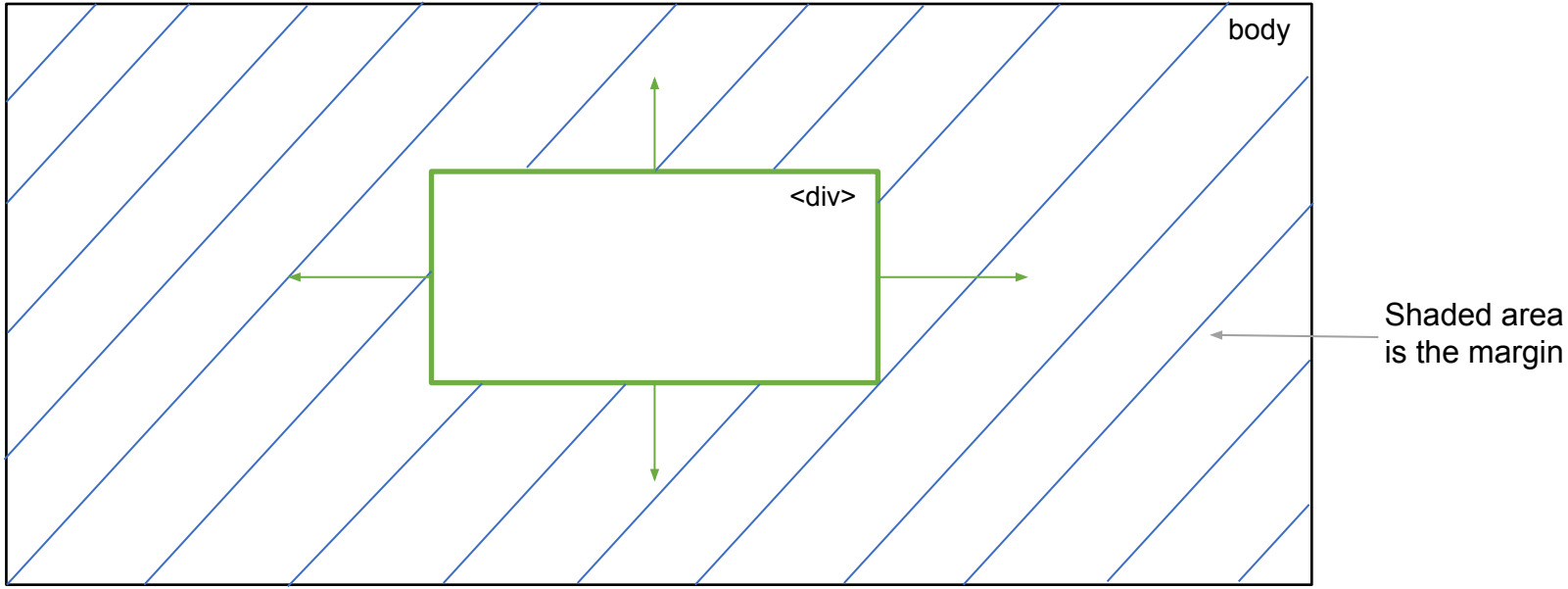
- Therefore, the total width of element = Actual width + Left padding + Right padding + Left border + Right border + Left margin + Right margin**.**
- The total height of element = Actual height + Top padding + Bottom padding + Top border + Bottom border + Top margin + Bottom margin.

CSS Margins



Introduction to Margins

Margins are essentially the spaces **outside** the element. They are the spaces that are **away from the element.** An element can have margins on all the four sides - top, right, bottom and left.



CSS Margins

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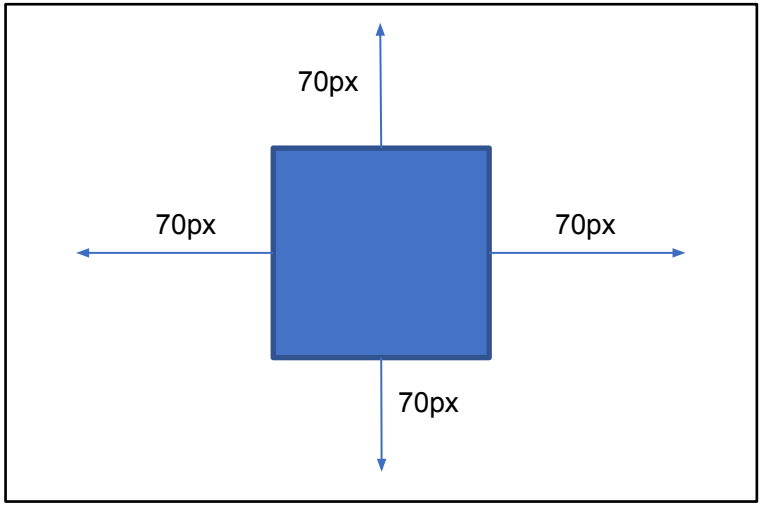
Syntax

Margins can be set simply by calling the **margin** property and giving it a value.

```
div {
   margin: 70px;
}
```



CSS Margins

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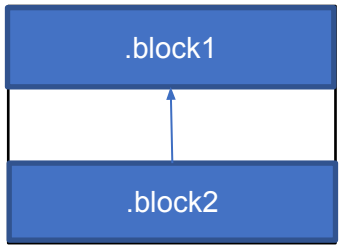
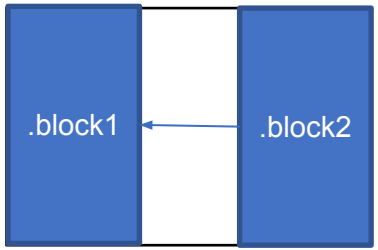
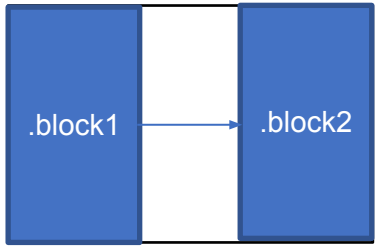
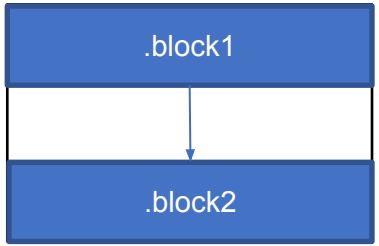
Margin for Every Side

Margins can be set for all the individual sides as shown below.










```
.block2 {
   margin-top: 70px;
}
```

```
.block2 {
   margin-left: 70px;
}
```

```
.block1 {
   margin-right: 70px;
}
```

```
.block1 {
   margin-bottom: 70px;
}
```

CSS Margins

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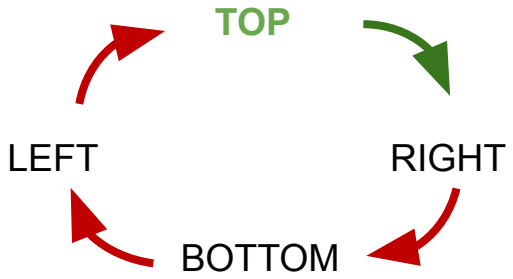
Margin Shorthand

Margins can be given shorthand for every side.




```
margin: 70px; /* SHORTHAND - This will give 70px as margin to all the sides. */
```

```
margin: 70px 50px; /* This will give 70px as margin to top & bottom; 50px to right & left. */
```

```
margin: 70px 50px 40px; /* This will give margin 70px to top; 50px to right & left; 40px to bottom. */
```

```
margin: 70px 50px 40px 60px; /* Margins are 70px to top; 50px to right; 40px to bottom; 60px to left. */
```

Aligning Element Horizontally in Center

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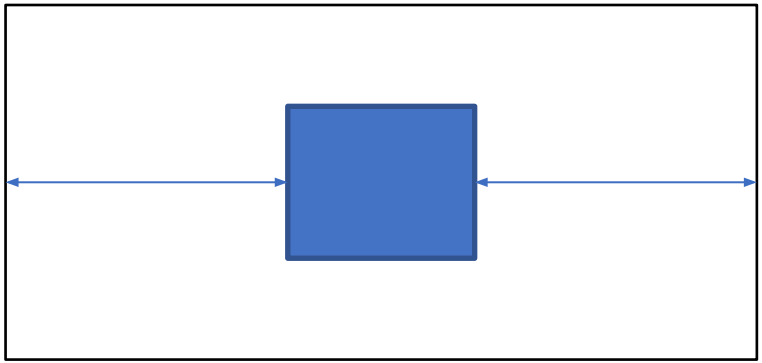
Margin Auto

- To horizontally centre an element within a container, you can use **margin: 0 auto**.
- The element should be given a specific width, and then, the *margin* should be set to 0 *auto*.
- The element will take up whatever width is given to it, and the remaining width will be equally split owing to the value *auto* of *margin* property.

```
div {
   width: 300px;
   margin: 0 auto;
}
```



Aligning Element Vertically in Center

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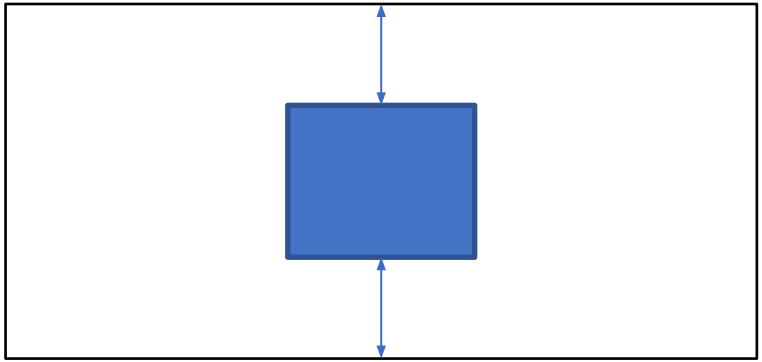
```
<head>
   <title>Vertical Align</title>
   <style>
      .container {
         width: 100px;
         height: 100px;
         border: 1px solid blue;
         background-color: black;
         margin: auto;
         margin-top: 20%;
         margin-bottom: 20%;
      }
   </style>
</head>
<body>
   <div class="container"></div>
</body>
```

- We can vertically align a div using margin property.



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Poll 3 (15 Sec)

According to the code given below, which of the following are the values of a margin ?

```
div {
   margin: 10px 20px 30px 40px;
}
```

1. margin-top: 20px; margin-right: 30px; margin-left: 40px; margin-bottom: 10px
2. margin-left: 10px; margin-top: 20px; margin-right: 30px; margin-bottom: 40px
3. margin-right: 20px; margin-left: 30px; margin-top: 40px; margin-bottom: 10px
4. margin-top: 10px; margin-right: 20px; margin-left: 30px; margin-bottom: 40px

Poll 3 (Answer)

According to the code given below, which of the following are the values of a margin ?

```
div {
   margin: 10px 20px 30px 40px;
}
```

1. margin-top: 20px; margin-right: 30px; margin-left: 40px; margin-bottom: 10px
2. margin-left: 10px; margin-top: 20px; margin-right: 30px; margin-bottom: 40px
3. margin-right: 20px; margin-left: 30px; margin-top: 40px; margin-bottom: 10px
4. **margin-top: 10px; margin-right: 20px; margin-left: 30px; margin-bottom: 40px**

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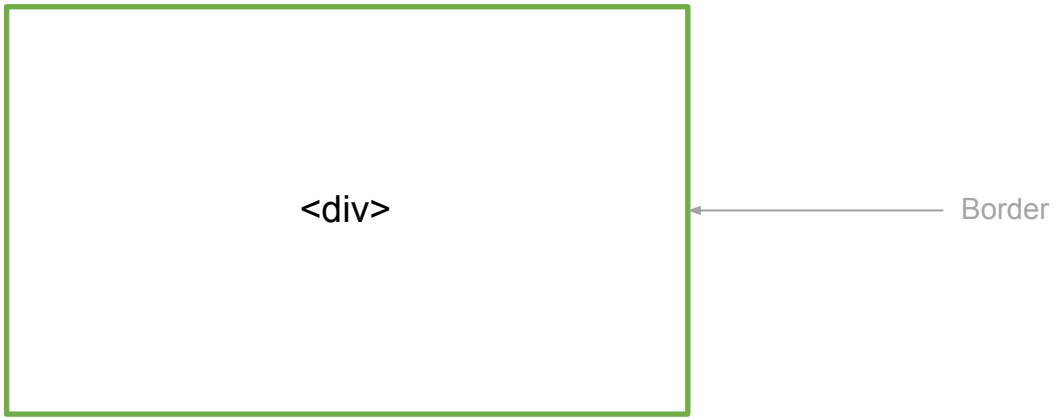
CSS Borders

Introduction to Borders

A border is a *covering* around an element. An element has borders on all the four sides: top, right, bottom and left.



Border-Style and Border-Width

border-width

The border-width property specifies the width that needs to be given to the borders. It can be in px or thick/thin/medium. The default value of border-width property is medium.

```
div {
   border-width: thick;
}
```

---

border-style

The border-style property denotes the shape and the style of a border. It can be dotted, dashed, solid, double, etc. The default value of border-style property is none.

```
div {
   border-style: dotted;
}
```

Border-Color and Border (Shorthand)

border-color

The border-color property assigns a color to the border.

```
div {
   border-color: blue;
}
```

---

border

The border shorthand property needs the following syntax: **border:** ***border-width border-style border-color***.
It is mandatory to give a border-style property for the border to be visible.

```
div {
   border: 1px solid red;
}
```

Individual Borders

- In CSS, you can assign different values to the individual sides (top, right, bottom and left) of the borders.
- You can either specify the value individually using properties, such as the **border-top-style** or **border-bottom-width** property, or you can use the shorthand property. Here, you will learn about the shorthand property.

```
border-color: blue; /*This will give blue color to all borders */
```

```
border-color: blue red; /*top & bottom – blue; right & left - red*/
```

```
border-color: blue red green; /*top – blue; right & left – red;
bottom – green */
```

```
border-color: blue red green yellow; /*top – blue; right – red;
bottom – green; left- yellow */
```

border-top-style

The border-top-style property can be used to set the style top border. The values of border-top-style property can be none, dotted, dashed, solid, groove, inset. The default value of this property is ***none***.

```
div {
  border-top-style: dotted;
}
```

---

border-bottom-width

The border-bottom-width is the property of set the border bottom width. The default value of border-bottom-width shorthand property is ***medium***.

```
div {
   border-bottom-width: 4px;
}
```

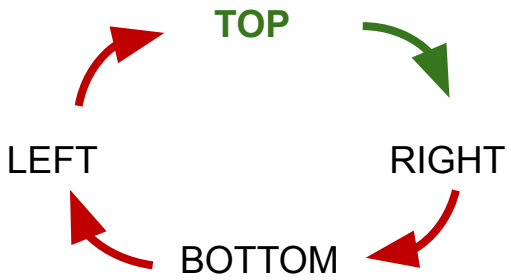
Rounded Border

border-radius

The border-radius property makes the border take circular shape and hence you need to define the radius for the circle. You can also assign a different radius to an individual border.

```
div {
   border: 1px solid blue;
   border-radius: 10px;
}
```

Individual Sides



- For **borders, margins** and **paddings**, you can set different properties to individual sides using a shorthand property.
- To remember the shorthand property, think of a box and start clockwise from the top. The next sides would be in the following order: right, bottom and left.
- If there are four values, then the order would be *top right bottom left*; if there are three, then the order would be *top right & left bottom*; if there are two, then the order would be *top & bottom right & left*; and if there is only one, then the order would be all *top & right & bottom & left*; in short, all the sides.

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Poll 4 (15 Sec)

In the code given below, of which of the following is the shorthand property for *border*?
Note: More than one option can be correct

```
div { border: 1px solid blue; }
```

1. border-width border-style border-color
2. border-radius border-style
3. border-width border-style border-color border-radius
4. border-style border-color

Poll 4 (Answer)

In the code given below, of which of the following is the shorthand property for *border*?
Note: More than one option can be correct

```
div { border: 1px solid blue; }
```

1. **border-width border-style border-color**
2. border-radius border-style
3. border-width border-style border-color border-radius
4. **border-style border-color**

Poll 5 (15 Sec)

Which of the following properties helps you achieve rounded border?

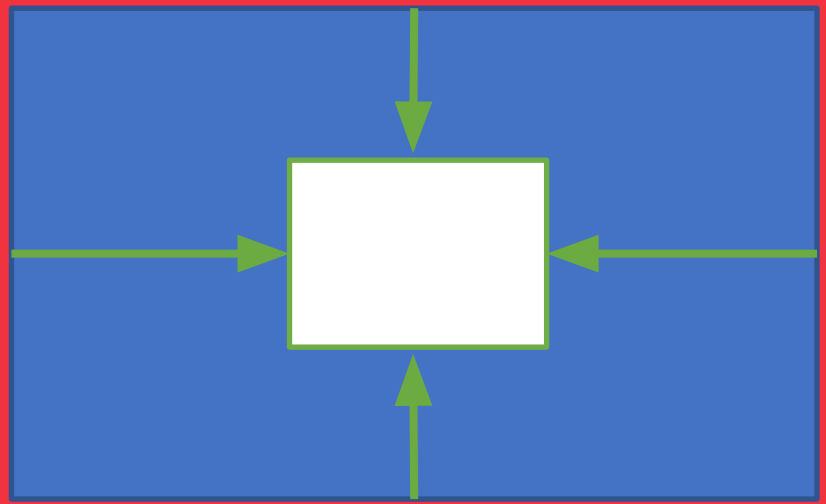
1. border-width
2. border-style
3. border-color
4. border-radius

Poll 5 (Answer)

Which of the following properties helps you achieve rounded border?

1. border-width
2. border-style
3. border-color
4. **border-radius**

CSS Paddings



CSS Paddings

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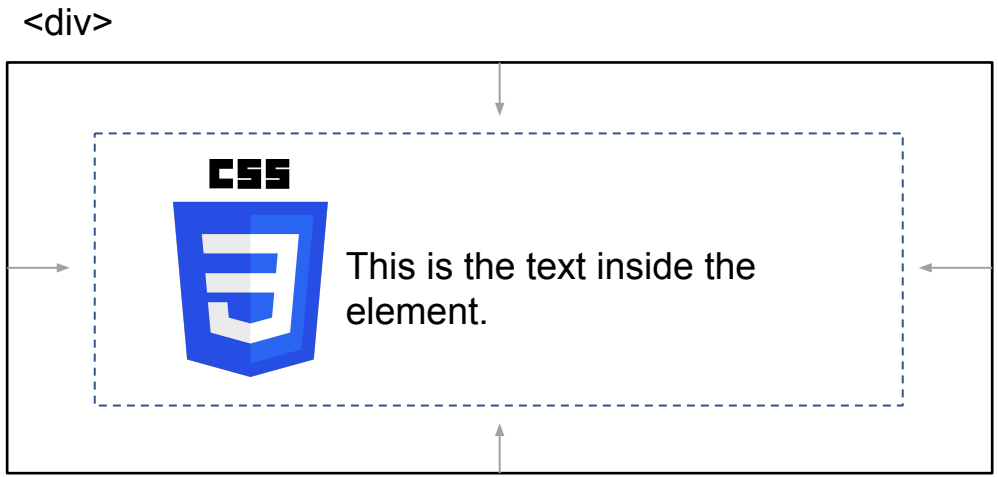
Introduction to Paddings

Paddings are essentially the spaces **inside** an element, i.e., they are the spaces **between the content inside the element and the element's borders.** An element has padding on all four sides: top, right, bottom and left.



CSS Paddings

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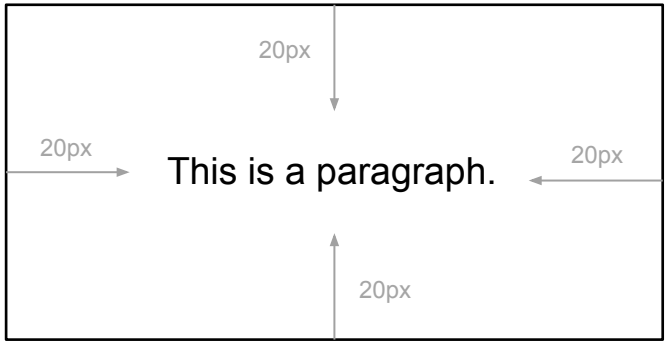
Syntax

Paddings for all the sides together can be set by simply calling the **padding** property and assigning it a value.

```
<div>
     <p>This is a paragraph.</p>
</div>

div {
   border: 1px solid red;
   padding: 20px;
}
```



CSS Paddings

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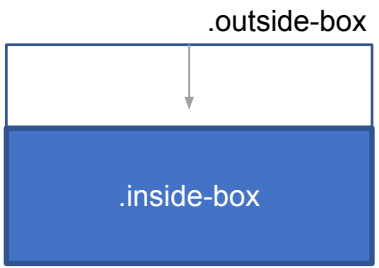
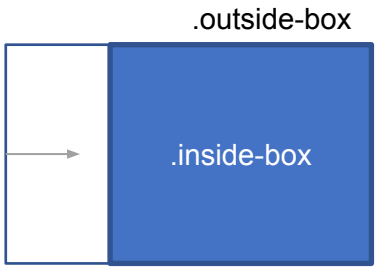
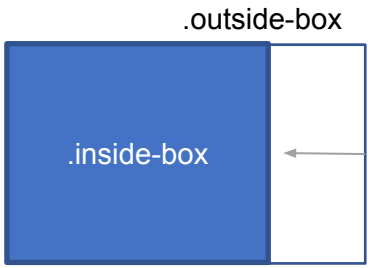
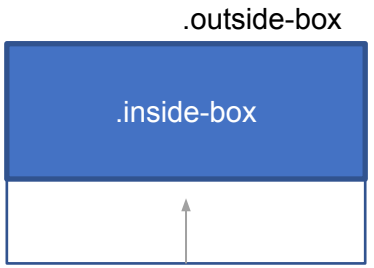
Paddings for Every Side

Paddings can be set for all the individual sides as shown below.










```
.outside-box {
   padding-top: 20px;
}
```

```
.outside-box {
  padding-left: 20px;
}
```

```
.outside-box {
  padding-right: 20px;
}
```

```
.outside-box {
  padding-bottom: 20px;
}
```

CSS Paddings

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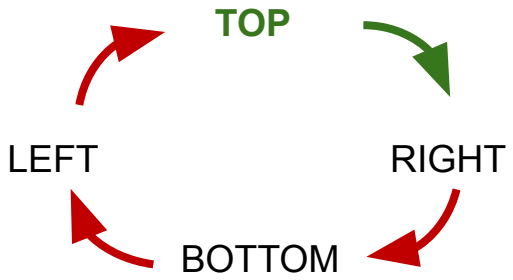
Paddings Shorthand

Similar to borders and margins, paddings can also be given a shorthand for every side.




```
padding: 70px; /* SHORTHAND - This will give 70px as padding to all the sides. */
```

```
padding: 70px 50px; /* This will give 70px as padding to top & bottom; 50px to right & left. */
```

```
padding: 70px 50px 40px; /* This will give padding 70px to top; 50px to right & left; 40px to bottom. */
```

```
padding: 70px 50px 40px 60px; /* Paddings are 70px – top; 50px – right; 40px – bottom; 60px – left. */
```

CSS Paddings

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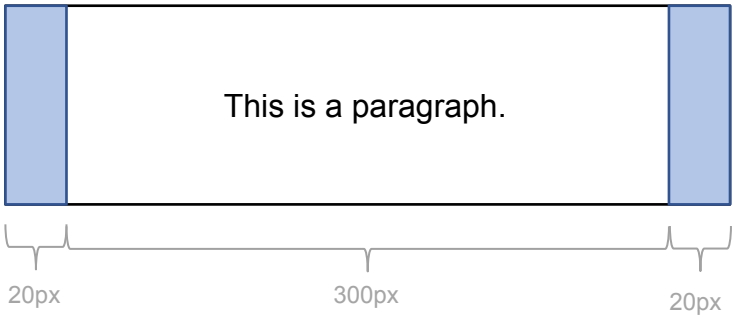
Box-Sizing

Question: What will be the total width of the *div* that has the class *inside-box*?

```
<div class="outside-box">
     <div class="inside-box">
          This is a paragraph.
     </div>
</div>

.inside-box {
   padding: 20px;
   width: 300px;
}
```



20px + 300px + 20px = 340px

CSS Paddings

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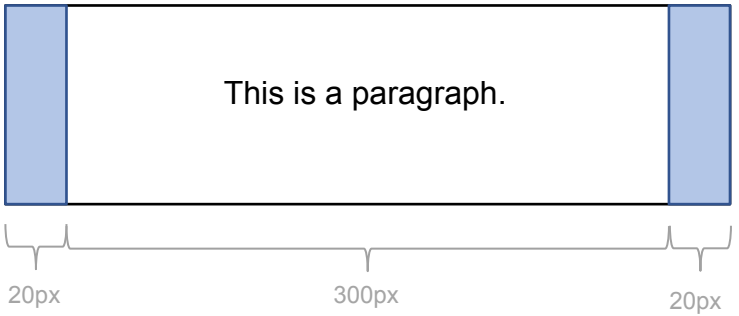
Box Sizing: Content-Box

```
<div class="outside-box">
     <div class="inside-box">
          This is a paragraph.
     </div>
</div>

.inside-box {
   padding: 20px;
   width: 300px;
}
```



20px + 300px + 20px = 340px

- As you noticed, padding increases the width of the div. There might be instances where you do not need the padding effect. For such instances, you can use the **box-sizing** property.
- This property of box-sizing that affects the width is the **content-box** property (i.e. width and height properties of the div include the content. However, the other box properties such as padding, border, or margin are not considered. content-box property is the default value.

CSS Paddings

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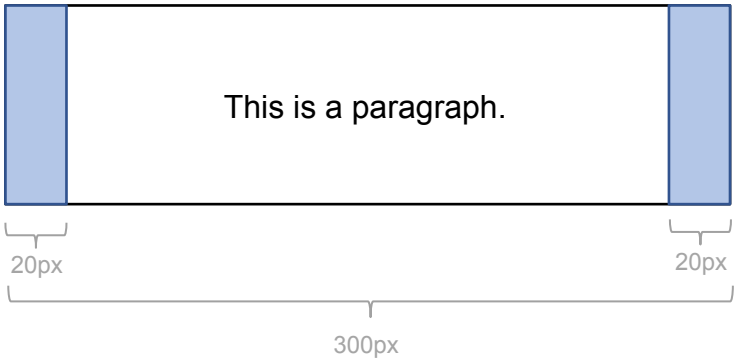
Box Sizing: Border-Box

```
<div class="outside-box">
     <div class="inside-box">
          This is a paragraph.
     </div>
</div>

.inside-box {
   padding: 20px;
   width: 300px;
   box-sizing: border-box;
}
```



- While using the value **border-box** for *box-sizing* property, the element's content width is adjusted so that the total width remains 300px.

CSS Outline

CSS Outline

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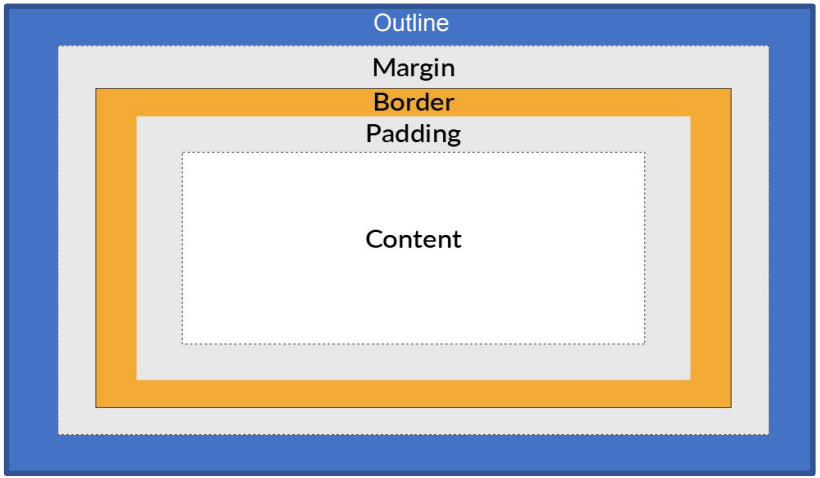
Introduction to Outline

Outlines are the lines around the element, that is, **Outside** the element.



CSS Outline

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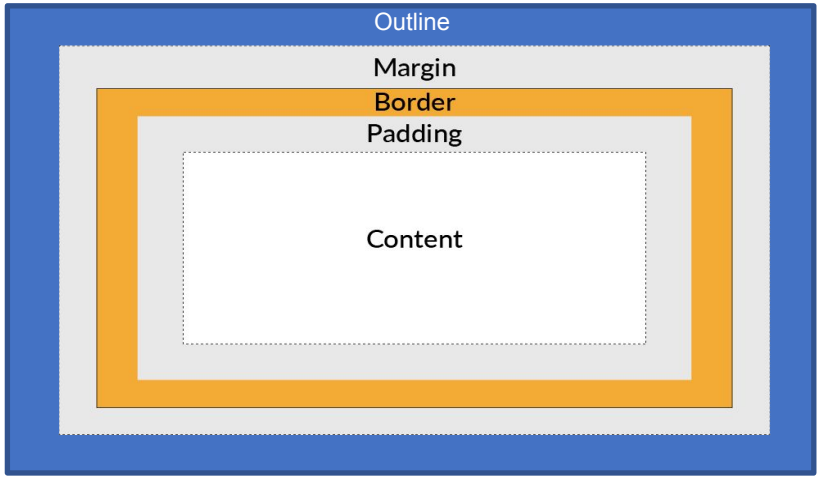
Introduction to Outline

Outlines are the lines around the element, that is, **Outside** the element.



Outline	Border
Outlines will never take up space because they are drawn outside the elements content.	Whereas borders take up some space.
Each edge of the outline cannot be set to different widths, colors and style.	Each edge of the border can be set to different width, color and style.
Outline does not allow us to change the size of the element.	Border allows us to change the size of the element.

CSS Outline

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Outline Properties

The outline-style property gives style to the outline (e.g., dotted, dashed and solid).

```
outline-style: dotted;
```

The outline-width property gives width to the outline (e.g., px, thin, medium and thick).

```
outline-width: 20px;
```

The outline-color property gives color to the outline (e.g., blue, orange, red and green). If we want the outline to be visible regardless of the background, you can invert it which will , perform a color inversion of the background.

```
outline-color: blue;
```

Outline Shorthand

For the outline shorthand, you need to specify the *outline-width outline-style* and *outline-color*.

```
outline: 20px solid blue;
```

CSS Outline

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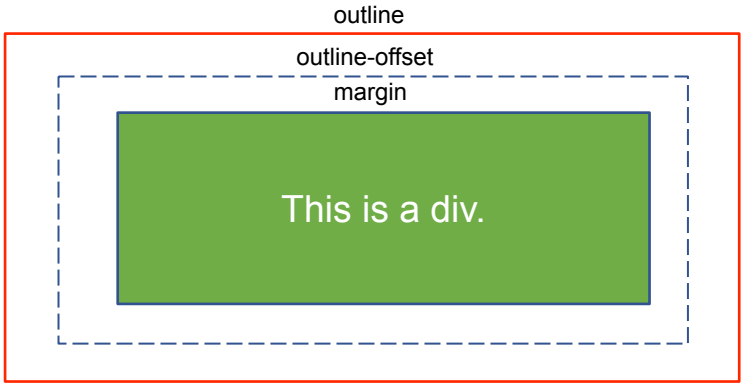
Outline Offset

The outline-offset property adds space between the outline and the border/edge of the element. The space between an element and a border is transparent.

```
div {
   background: green;
   color: white;
   margin: 30px;
   border: 1px solid black;
   outline: 1px solid red;
   outline-offset: 15px;
}
```



Poll 6 (15 Sec)

Which of the following is true about the *padding* property in CSS?

1. It is used to create a border around an HTML element.
2. It is used to create space around an HTML element outside the confined borders.
3. It is used to create space around an HTML element inside the confined borders.
4. Both 1 and 3

Poll 6 (Answer)

Which of the following is true about the *padding* property in CSS?

1. It is used to create a border around an HTML element.
2. It is used to create space around an HTML element outside the confined borders.
3. **It is used to create space around an HTML element inside the confined borders.**
4. Both 1 and 3

Hands-On Exercise 1 (3 min)

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Write a program for the given stub code such that the output is as shown in the adjoining screenshot.
Here,

- You can set the background image of the body as follows: https://images.pexels.com/photos/413195/pexels-photo-413195.jpeg?auto=compress&cs=tinysrgb&dpr=2&h=650&w=940
- The body should cover the entire page.
- The background color for the content div is aqua.
- The background color for the padding div is brown, and the padding is 20px.
- The background color for the border div is black. The border is 10px and is dotted and represented in white.
- The background color for the margin div is yellow. The top margin is 10px, the right one is 15px, the bottom one is 20px and the left one is 25px.

The stub code is provided here.
The solution is provided here.

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Project Work

(Let us add some more CSS to our project.)

You can refer to the solution here.

Key Takeaways

- HTML elements have the following four primary properties: content, padding (between the edge of the element and the content), border (a line along the edge of the element) and margin (the space outside the element's edge/border).
- Combination of these aforementioned properties is called the CSS box model.
- The CSS outline is the line outside the margin of the element.

The following tasks are to be completed after today's session:

MCQs
Coding Questions
Project - Checkpoint 5

In the next class, we will discuss...

- Different CSS Layouts
- How to apply styles to the children and sibling elements of an element?
- How to apply styles to only the first letter or the first word of a text element?

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Thank you!