Topic 1

B. Introduction to CSS

- Cascading Style Sheet
- Pseudo-classes
- Pseudo-elements

Introducing CSS

- The appearance of the page is determined by one or more style sheets written in the **Cascading Style Sheets** (CSS) language
- The latest version of the CSS language is **CSS3**
- CSS3 is built upon several **modules**, where each module is focused on a separate design topic

Introducing CSS

types

- **Browser styles** or **user agent styles** – Styles built into the browser
- **User-defined styles** – Styles defined by a user based on the configuration setting of the user's browser

- **External styles** – Styles created by a website author, placed within a CSS file, and linked to the page
- **Embedded styles** – Styles added to the head of an HTML document
- **Inline styles** – Styles added as element attributes within an HTML document and applied to only that particular element

Exploring Style Rules

- The general syntax of a CSS style rule is

```
selector{
      property1: value1;
      property2: value2;
      ...
}
```

Exploring Style Rules

- **Browser extensions** are an extended library of style properties in the browser
- **Vendor prefix** – Indicates the browser vendor that created and supports the style property

Vendor prefixes for browser extensions

Vendor Prefix	Rendering Engine	Browsers
`-khtml-`	KHTML	Konqueror
`-moz-`	Mozilla	Firefox, Camino
`-ms-`	Trident	Internet Explorer
`-o-`	Presto	Opera, Nintendo Wii browser
`-webkit-`	WebKit	Android browser, Chrome, Safari

Embedded Style Sheets

- They are inserted directly into the HTML file as metadata by adding the following element to the document head

```
<style>
     style rules
</style>
```

where *style rules* are the different rules embedded in the HTML page

Inline Styles

- They are styles applied directly to specific elements using the following **style** attribute

```
<element style="property1: value1;
                property2: value2; …">
     content
</element>
```

where the *property:value* pairs define the styles applied directly to that element

Style Specificity and Precedence

- The more specific style rule has precedence over the more general style rule
- Specificity is an issue when two or more styles conflict
- If two rules have equal specificity and equal importance, then the one that is defined last has precedence

Style Inheritance

- **Style inheritance** – Process in which properties are passed from a parent element to its children
- For example, the following style rule sets the color of article text to blue and the rule is passed to any paragraph or other elements nested within that article

```
article {color: blue;}
p {text-align: center;}
```


Importing Style Sheets

- **@import** is a CSS at-rule used to import the content of a style sheet file

  `@import url(`*`url`*`);`

  where *url* is the URL of an external stylesheet file
- It is similar to adding `link` elements to an HTML file

Color in CSS

- **Color values** – Values in which the color is given by an exact numeric representation
- **RGB triplet** – The intensity of primary colors expressed as a set of numbers in CSS

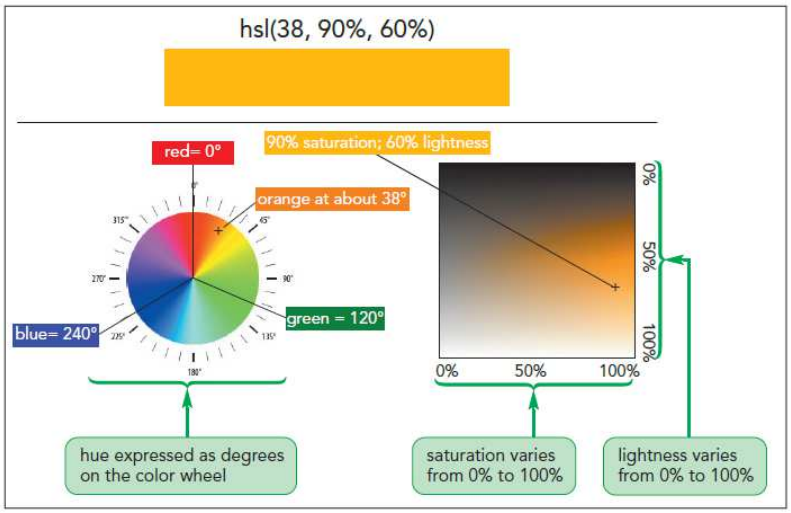
```
rgb(red, green, blue)
```

- Hexadecimal numbers – A number expressed in the base 16 numbering system

HSL Color Values

- **Hue** – Tint of a color, represented by a direction on a color wheel
- Saturation – Measures the intensity of a color and ranges from 0% (no color) up to 100% (full color)
- Lightness – Measures the brightness of a color and ranges from 0% (black) up to 100% (white)

HSL Color Values



Defining Semi-Opaque Colors

- **Opacity** – Defines how solid a color appears
- A color's opacity is specified using the following properties:
  - `rgba(red, green, blue, opacity)`
  - `hsla(hue, saturation, lightness, opacity)`

  where `opacity` sets the opacity of the color ranging from 0 (completely transparent) up to 1.0 (completely opaque)

Setting Text and Background Color

- CSS defines the text and background color for each element on a webpage

```
color: color;
background-color: color;
```

where *color* is a color name or a color value

Contextual Selectors

- **Contextual selector** – Specifies the context under which a particular page element is matched
- Context is based on the hierarchical structure of a document, which involves the relationships between a **parent element** containing one or more **child elements** and within those child elements several levels of **descendant elements**

Contextual selectors

Selector	Description
*	Matches any element
elem	Matches the element *elem* located anywhere in the document
elem1, elem2, …	Matches any of the elements *elem1*, *elem2*, etc.
parent descendant	Matches the *descendant* element that is nested within the *parent* element at some level
parent > child	Matches the *child* element that is a child of the *parent* element
elem1 + elem2	Matches *elem2* that is immediately preceded by the sibling element *elem1*
elem1 ~ elem2	Matches *elem2* that follows the sibling element *elem1*

Contextual Selectors

- To match any element, a **wildcard selector** with the * character is used
- **Sibling selectors** are used to select elements based on elements that are adjacent to them in the document hierarchy

Attribute Selectors

- Selectors also can be defined based on attributes and attribute values within elements
  - id – Identifies specific elements within the document
  - class– Identifies a group of elements that share a similar characteristic or property

Attribute Selectors

Selector	Selects	Example	Selects
elem#*id*	Element *elem* with the ID value *id*	h1#intro	The h1 heading with the id *intro*
#*id*	Any element with the ID value *id*	#intro	Any element with the id *intro*
elem.*class*	All *elem* elements with the class attribute value *class*	p.main	All paragraphs belonging to the *main* class
.*class*	All elements with the class value *class*	.main	All elements belonging to the *main* class
elem[*att*]	All *elem* elements containing the *att* attribute	a[href]	All hypertext elements containing the href attribute
elem[*att*="*text*"]	All *elem* elements whose *att* attribute equals *text*	a[href="top.html"]	All hypertext elements whose href attribute equals *top.html*
elem[*att*~="*text*"]	All *elem* elements whose *att* attribute contains the word *text*	a[rel~="glossary"]	All hypertext elements whose rel attribute contains the word *glossary*
elem[*att*|="*text*"]	All *elem* elements whose *att* attribute value is a hyphen-separated list of words beginning with *text*	p[id|="first"]	All paragraphs whose id attribute starts with the word *first* in a hyphen-separated list of words
elem[*att*^="*text*"]	All *elem* elements whose *att* attribute begins with *text* [***CSS3***]	a[rel^="prev"]	All hypertext elements whose rel attribute begins with *prev*
elem[*att*$="*text*"]	All *elem* elements whose *att* attribute ends with *text* [***CSS3***]	a[href$="org"]	All hypertext elements whose href attribute ends with *org*
elem[*att**="*text*"]	All *elem* elements whose *att* attribute contains the value *text* [***CSS3***]	a[href*="faq"]	All hypertext elements whose href attribute contains the text string faq

Working with Fonts

- **Typography** is the art of designing the appearance of characters and letters on a page
- Color and font are one of few properties in the CSS family of typographical styles

- Text characters are based on **fonts** that define the style and appearance of each character in the alphabet
- The general structure of defining font for any page element is

```
font-family: fonts;
```

where *fonts* is a comma-separated list, also known as a font stack

Working with Fonts

Generic Types

- **Specific font** – Identified by name and based on a font definition file stored in a user's computer or accessible on the web
- **Generic font** – Describes the general appearance of the characters in the text but does not specify any particular font definition file
  - Supports the font groups **serif, sans-serif, monospace, cursive, and fantasy**

Setting the Font Size

- To set a font size, use the style property

```
font-size: size;
```

  where size is a CSS unit of length in either relative or absolute units.
- **Absolute units** – Fixed in size regardless of the output device and are used only with printed media
- **Relative units** – Expressed relative to the size of other objects within the web page or to the display properties of the device itself

- Text is made scalable with all font sizes expressed relative to default font sizes
- The three relative measurements used to provide scalability are
  - percentage
  - em unit
  - rem or root em unit

Using Viewport Units

- **Viewport unit** – A relative unit used to express length as a percentage if the width and height if the browser window
- CSS3 introduced four viewport units
  - 1 vw = 1% of the browser window width
  - 1 vh = 1% of the browser window height
  - 1 vmin = 1 vw or 1 vh (whichever is smaller)
  - 1 vmax = 1 vw or 1 vh (whichever is larger)

Sizing Keywords

- Font sizes are expressed using the following keywords
  - `xx-small`
  - `x-small`
  - `small`
  - `medium`
  - `large`
  - `x-large`
  - `xx-large`
  - `larger`
  - `smaller`

Controlling Spacing and Indentation

- **Kerning** measures the amount of space between characters, while **tracking** measures the amount of space between words
- The properties to control an element's kerning and tracking are:

```
letter-spacing: value;
word-spacing: value;
```


Controlling Spacing and Indentation

- Leading – Measures the amount of space between lines of text and is set using the following line-height property:

```
line-height: size;
```

- Text spacing can be controlled by setting the indentation for the first line of text block by using the **text-indent** property

```
text-indent: size;
```

Working with Font Styles

- To specify the font style, use
  `font-style: type;`
  where *type* is normal, italic, or oblique
- To change the weight of the font, use
  `font-weight: weight;`
  where *weight* is the level of bold formatting applied to the text

Working with Font Styles

- To specify a text decoration, use
  `text-decoration: type;`
  where type is none, underline, overline, or line-through
- To transform text, use
  `text-transform: type;`
  where type is capitalize, uppercase, lowercase, or none
- To display a font variant of text, use
  `font-variant: type;`
  where type is normal or small-caps

Aligning Text Horizontally and Vertically

- To horizontally align the text , use
  `text-align: alignment;`
  where alignment is left, right, center, or justify
- To vertically align the text within each line, use
  `vertical-align: alignment;`
  where alignment is baseline, bottom, middle, sub, super, text-bottom, text-top, or top

Aligning Text Horizontally and Vertically

Value	Description
`baseline`	Aligns the baseline of the element with the baseline of the parent element
`bottom`	Aligns the bottom of the element with the bottom of the lowest element in the line
`middle`	Aligns the middle of the element with the middle of the surrounding content in the line
`sub`	Subscripts the element
`super`	Superscripts the element
`text-bottom`	Aligns the bottom of the element with the bottom of the text in the line
`text-top`	Aligns the top of the element with the top of the text in the line
`top`	Aligns the top of the element with the top of the tallest object in the line

Working with Font Styles

Shorthand

- The text and font styles can be combined using the following shorthand font property:

```
font: style variant weight size/height family;
```

where style is the font's style, variant is the font variant, weight is the font weight, size is the font size, height is the height of each line, and family is the font stack

Formatting Lists

- **List marker** – It is the default browser style symbol displayed before each list item for unordered and ordered lists
- To change the type of list marker or to prevent any display of a list marker, use

```
list-style-type: type;
```

where type is the various types of markers

Formatting Lists

list-style-type	Marker(s)
`disc`	●
`circle`	○
`square`	■
`decimal`	1, 2, 3, 4, …
`decimal-leading-zero`	01, 02, 03, 04, …
`lower-roman`	i, ii, iii, iv, …
`upper-roman`	I, II, III, IV, …
`lower-alpha`	a, b, c, d, …
`upper-alpha`	A, B, C, D, …
`lower-greek`	α, β, γ, δ, …
`upper-greek`	A, B, Γ, Δ, …
`none`	no marker displayed

Setting the List Marker Position

- CSS treats each list item as a block-level element, placed within a virtual box in which the list marker is placed outside of the list text
- To change the default behaviour, use

```
list-style-position: position;
```

where position is either outside or inside

Working with Margins and Padding

- Block-level elements follow the structure of the **box model**
- Contents in a **box model** are enclosed within the following series of concentric boxes:
  - The content of the element itself
  - The **padding space**, which extends from the element's content to a border

Working with Margins and Padding

- The **border** surrounding the padding space
- The **margin space** comprised of the space beyond the border up to the next page element

Setting the Padding Space

- To set the width of the padding space, use the following **padding** property

  `padding: size;`

  where size is expressed in one of the CSS units of length or the keyword auto to let the browser automatically choose the padding

Setting the Margin and Border Spaces

- To set the size of the margin around block-level elements, use
  - `margin: size;`
  - `margin: top right bottom left;`
- To set the size of the border space, use
  - `border-width: size;`
  - `border-width: top right bottom left;`

Using Pseudo-Classes and Pseudo-Elements

- **Pseudo-class** – classifies an element based on its current status, position, or use in the document

  element: pseudo-class

  where element is an element from the document and pseudo-class is the name of a css pseudo-class

- **Structural pseudo-class** – classifies an element based on its location within the structure of the HTML document

Using Pseudo-Classes and Pseudo-Elements

Pseudo-Class	Matches
`:root`	The top element in the document hierarchy (the `html` element)
`:empty`	An element with no content
`:only-child`	An element with no siblings
`:first-child`	The first child of the parent element
`:last-child`	The last child of the parent element
`:first-of-type`	The first descendant of the parent that matches the specified type
`:last-of-type`	The last descendant of the parent that matches the specified type
`:nth-of-type(n)`	The n^{th} element of the parent of the specified type
`:nth-last-of-type(n)`	The n^{th} from the last element of the parent of the specified type
`:only-of-type`	An element that has no siblings of the same type
`:lang(code)`	The element that has the specified language indicated by *code*
`:not(selector)`	An element not matching the specified *selector*

Pseudo-classes for Hypertext

- **Dynamic pseudo-class** – A type of pseudo-class in which the class can change state based on the actions of the user

Pseudo-Class	Description
`:link`	The link has not yet been visited by the user.
`:visited`	The link has been visited by the user.
`:active`	The element is in the process of being activated or clicked by the user.
`:hover`	The mouse pointer is hovering over the element.
`:focus`	The element is receiving the focus of the keyboard or mouse pointer.

Pseudo-Elements

- **Pseudo-element** – An object that exists only in the rendered page
- Pseudo-elements can be selected using the following CSS selector:

  element`::`*pseudo-element*

  where element is an element from the HTML file and pseudo-element is the name of a CSS pseudo-element

Pseudo-Element	Description
`::first-letter`	The first letter of the element text
`::first-line`	The first line of the element text
`::before`	Content inserted directly before the element
`::after`	Content inserted directly after the element

Generating Content with CSS

- New content can be added either before or after an element using the following **before** and **after** pseudo-elements:

```
element::before {content: text;}
element::after {content: text;}
```

where text is the content to be inserted into the rendered web page

Value	Description
`none`	Sets the content to an empty text string
`counter`	Displays a counter value
`attr(attribute)`	Displays the value of the selector's *attribute*
text	Displays the specified *text*
`open-quote`	Displays an opening quotation mark
`close-quote`	Displays a closing quotation mark
`no-open-quote`	Removes an opening quotation mark, if previously specified
`no-close-quote`	Removes a closing quotation mark, if previously specified
`url(url)`	Displays the content of the media (image, video, etc.) from the file located at *url*

Displaying Attribute Values

- The content property can be used to insert an attribute value into the rendered web page using the **attr( )** function

```
content: attr(attribute);
```

where attribute is an attribute of the selected element

- The **blockquote** and **q** elements are used for quoted material
- Decorative opening and closing quotation marks can be inserted using the **content** property as follows:

```
content: open-quote;
content: close-quote;
```

Working with Width and Height

- The width and height of an element are set using the following properties:

```
width: value;
height: value;
```

  where value is the width or height using one of the CSS units of measurement or as a percentage of the width or height of the parent element

Horizontally Centering a Block Element

- Block elements can be centered horizontally within their parent element by setting both the left and right margins to auto

```
body {
    margin-left: auto;
    margin-right: auto;
}
```


Vertical Centering

- Centering an element vertically can be accomplished by displaying the parent element as a table cell and setting the vertical-align property to middle
- For example, to vertically center the following h1 heading within the div element:

```
<div>
    <h1>Pandaisia Chocololates</h1>
</div>
```

- Apply the style rule

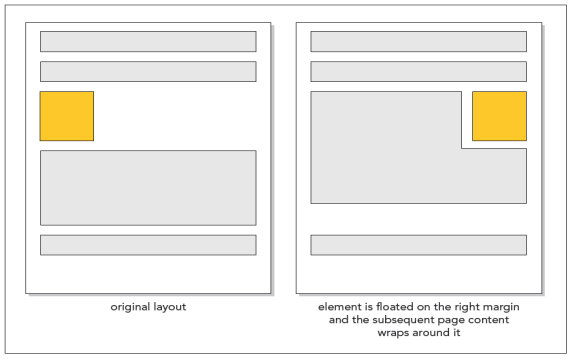
```
div {
    height: 40px;
    display: table-cell;
    vertical-align: middle;
}
```

Floating Page Content

- **Floating** an element takes it out of position and places it along the left or right side of its parent element
- To float an element, apply

```
float: position;
```

where position is none (the default), left to float the object on the left margin or right to float the object on the right margin



Clearing a Float

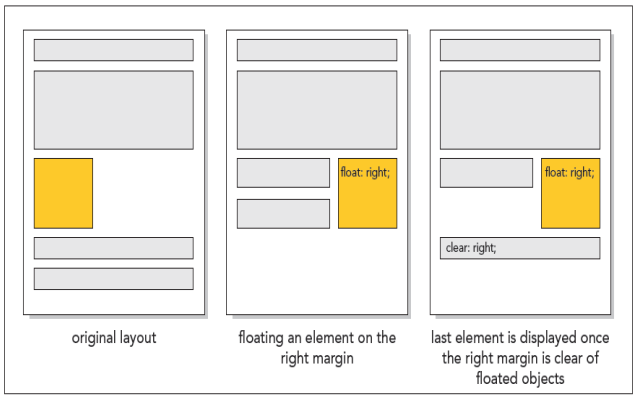
- To ensure that an element is always displayed below floated elements, use

```
clear: position;
```

where position is left, right, both, or none

- left – Displays the element only when the left margin is clear of floating objects
- right – Displays the element only when the right margin is clear of floating objects
- both – Displays the element only when both margins are clear of floats
- none – Displays the element alongside any floated objects

Clearing a Float



Refining a Floated Layout

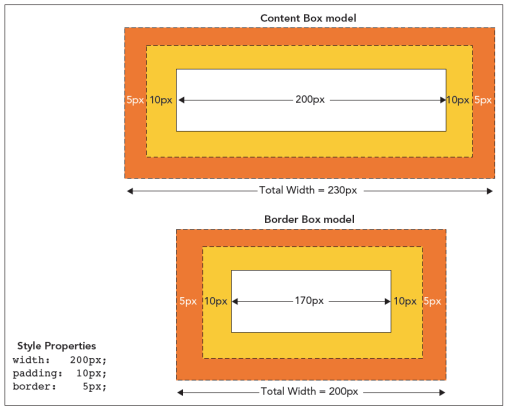
- **Content box model** – The width property refers to the width of an element content only
  - Additional space include padding or borders
- **Border box model** – The width property is based on the sum of the content, padding, and border spaces
  - Additional space taken up by the padding and border is subtracted from space given to the content

Refining a Floated Layout

- The layout model can be chosen using

  `box-sizing: type;`

  where type is content-box (the default), border-box, or inherit (to inherit the property defined for the element's container)



Position

The CSS positioning Styles

- To place an element at a specific position within its container, use

```
position: type;
top: value;
right: value;
bottom: value;
left: value;
```

  where type indicates the kind of positioning applied to the element and top, right, bottom, and left properties indicate the coordinates of the element

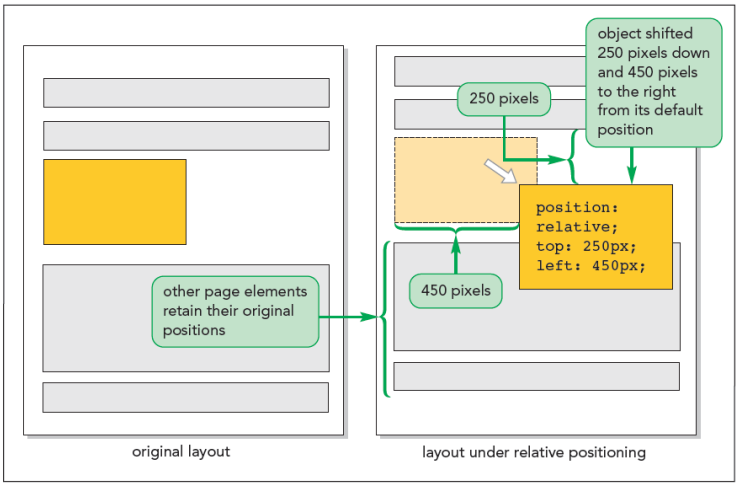
The CSS Positioning Styles

types

- **Static positioning** – The element is placed where it would have fallen naturally within the flow of the document
- **Relative positioning** – The element is moved out of its normal position in the document flow
- **Absolute positioning** – The element is placed at specific coordinates within containers

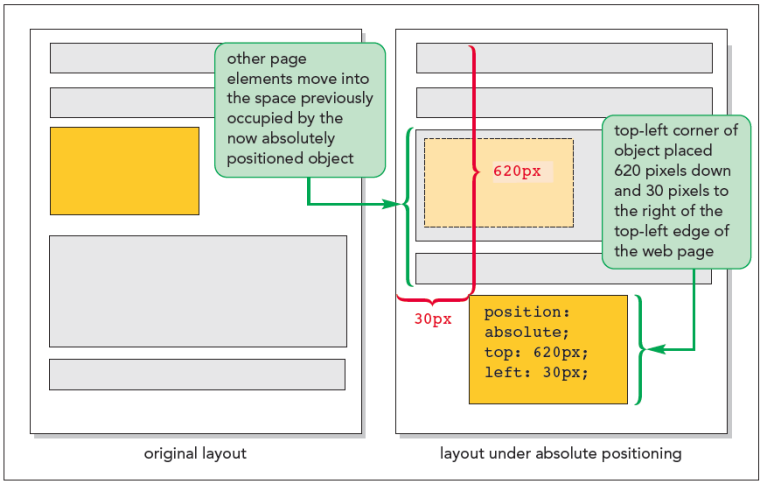
The CSS Positioning Styles

relative



The CSS Positioning Styles

absolute



Fixed and Inherited Positioning

- **Fixed positioning** – Fixes an object within a browser window to avoids its movement
- **Inherited positioning** – Allows an element to inherit the position value of its parent element

Overflow, Clipping, and Stacking

Handling Overflow

- Overflow – Controls a browser that handles excess content

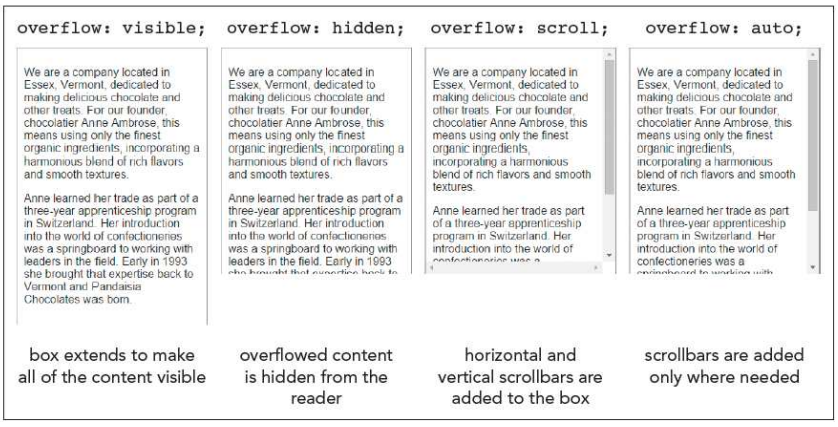
```
overflow: type;
```

where type is visible (the default), hidden, scroll, or auto

- visible – Instructs browsers to increase the height of an element to fit overflow contents
- hidden – Keeps an element at the specified height and width, but cuts off excess content
- scroll – Keeps an element at the specified dimensions, but adds horizontal and vertical scroll bars
- auto – Keeps an element at the specified size, adding scroll bars when they are needed

Handling Overflow

- CSS3 provides the overflow-x and overflow-y properties to handle overflow specially in the horizontal and vertical directions



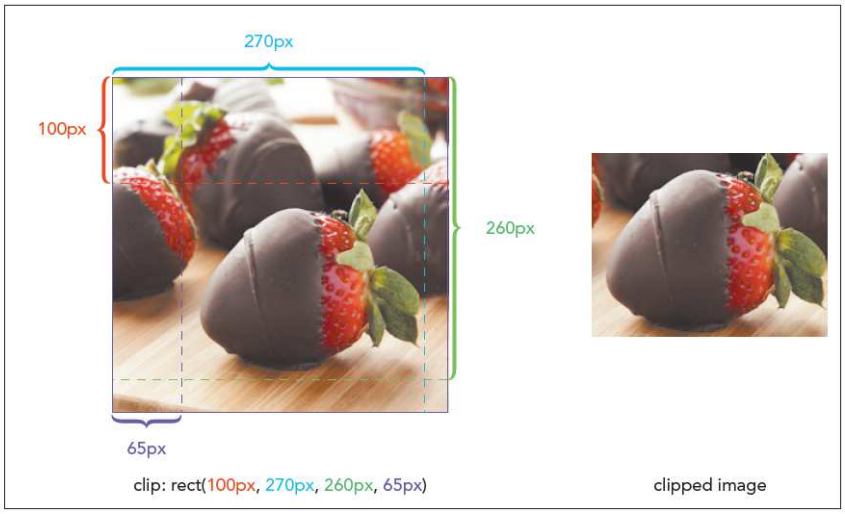
Clipping an Element

- **Clip** – Defines a rectangular region through which an element's content can be viewed
- Anything that lies outside the boundary of the rectangle is hidden
- The syntax of the clip property is

```
clip: rect(top, right, bottom,left);
```

where top, right, bottom, and left define the coordinates of the clipping rectangle

Clipping an Element



Stacking elements

- By default, elements that are loaded later by a browser are displayed on top of elements that are loaded earlier
- To specify different stacking order, use the following z-index property:

  `z-index: value;`

  where value is a positive or negative integer, or the keyword auto
- The z-index property works only for elements that are placed with absolute positioning