CS 2033

Multimedia & Communications II

LECTURE 5 – CASCADING STYLE SHEETS (CSS)

Announcements

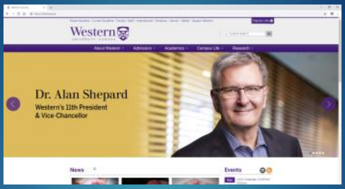
- Quiz 1 is this Wednesday-Thursday.
  - You may look at the lecture slides and your notes.
  - It will have some think-outside-the-box questions.
- Assignment 2 will be coming out later this week.

CSS

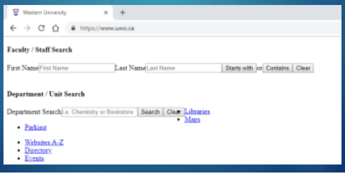
- Cascading Style Sheets
- CSS is used only to style websites.
- This is the standard for styling and goes hand in hand with HTML.
- Used for layouts/positioning of elements and their appearance, like colour, font colour, border, etc.

CSS

With CSS



Without CSS



Faculty / Staff Search

First Name [First Name] Last Name [Last Name] [Starts with] or [Contains] [Clear]

Department / Unit Search

Department Search [i.e. Chemistry or Bookstore] [Search] [Clear]

- Libraries
- Maps
- Parking
- Websites A-Z
- Directory
- Events

CSS

- Remember that divs and many other HTML elements can be nested within one another.
- This is helpful for creating layouts.
- This relationship is known as parent-child, where the parent is the container / outer element and the child is the inner element.

CSS

- What styles can be applied in CSS?
  - Tons! You'll need to know the common ones but not all of them.
- How are they applied?
  - 3 main ways to apply the basic styles (more for advanced styles).
- Where does CSS code go?
  - 3 different placement options.

Style types

7

- Layout
  - Width, height
  - Position type
  - Position values
  - Display type / float
  - Margins and padding
  - Top, right, bottom, and left (I call these TRBL or "trouble" ☺)

Style types

8

- Appearance
  - Background colour
  - Background image/texture
  - Font colour
  - Border style
  - Rounded corners
  - Opacity

Style types

9

- Many styles overlap both categories but I try to categorize them by their primary function.
  - i.e. size is used for layout but also impacts the appearance.
- Some styles only work if other styles are set in a certain way.
  - You will see this very soon when we discuss positioning.

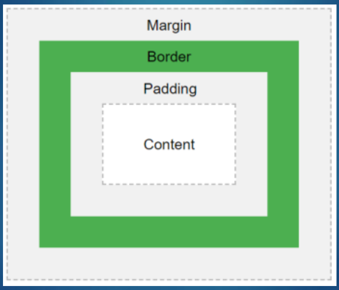
Layout-based styles

10

- Width and height are simple.
- Padding is the space just inside the element, keeping its contents away from the edge.
- Margin is the space outside the element, keeping it away from other elements.
- Most size styles are in px or %.

Layout-based styles

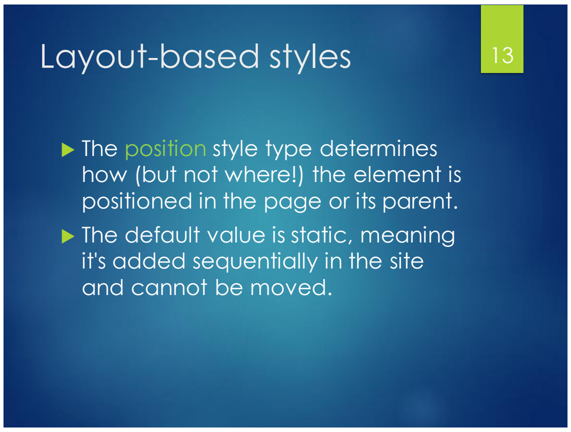
11



Layout-based styles

12

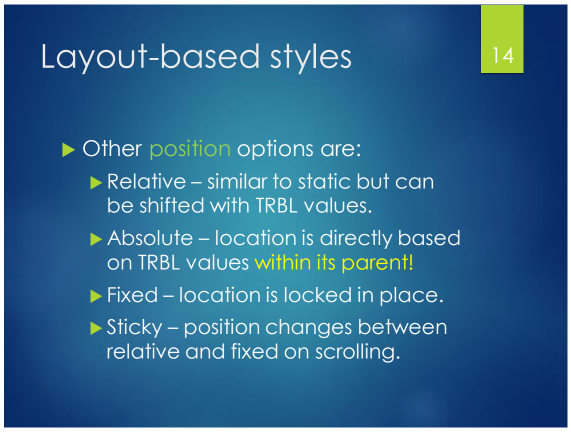
- Positioning elements can be done a few ways (or a combination).
- By default, elements are added sequentially top to bottom.
- Depending on size and layout styles, they may be added left to right in a row too.



Layout-based styles

13

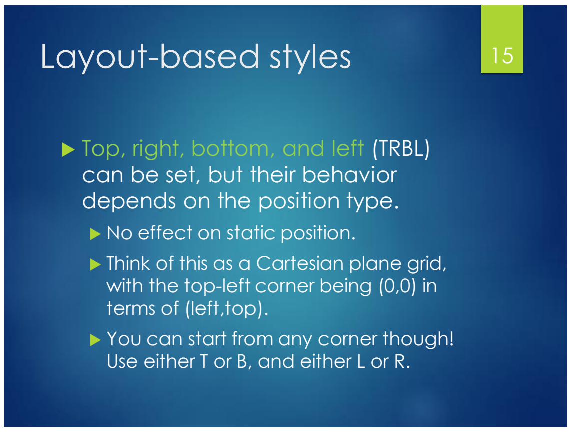
- The position style type determines how (but not where!) the element is positioned in the page or its parent.
- The default value is static, meaning it's added sequentially in the site and cannot be moved.



Layout-based styles

14

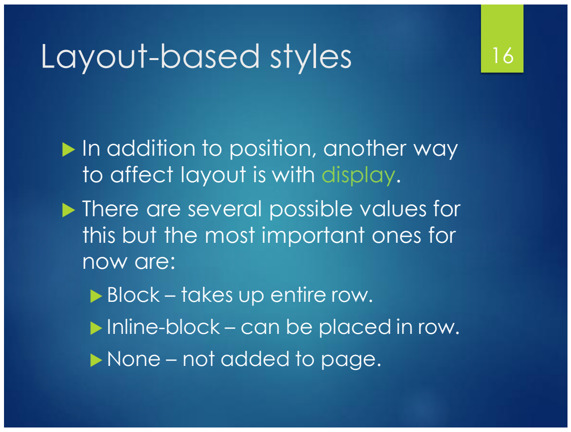
- Other position options are:
  - Relative – similar to static but can be shifted with TRBL values.
  - Absolute – location is directly based on TRBL values within its parent!
  - Fixed – location is locked in place.
  - Sticky – position changes between relative and fixed on scrolling.



Layout-based styles

15

- Top, right, bottom, and left (TRBL) can be set, but their behavior depends on the position type.
  - No effect on static position.
  - Think of this as a Cartesian plane grid, with the top-left corner being (0,0) in terms of (left,top).
  - You can start from any corner though! Use either T or B, and either L or R.



Layout-based styles

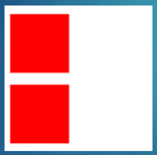
16

- In addition to position, another way to affect layout is with display.
- There are several possible values for this but the most important ones for now are:
  - Block – takes up entire row.
  - Inline-block – can be placed in row.
  - None – not added to page.

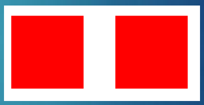
Layout-based styles

17

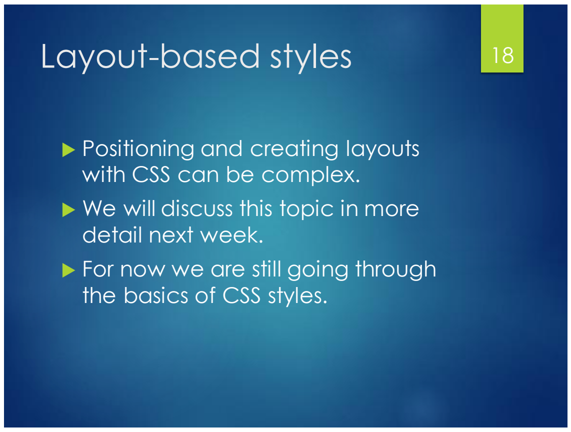
- If you want to place elements side by side, then try inline-block.



Block display



Inline-block display



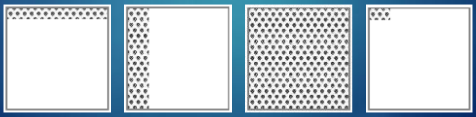
Layout-based styles

18

- Positioning and creating layouts with CSS can be complex.
- We will discuss this topic in more detail next week.
- For now we are still going through the basics of CSS styles.

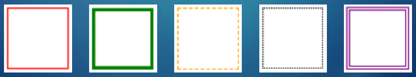
Appearance-based styles

- Background can be a solid colour, gradient, transparent, or an image.
- For a texture/image, you can also set whether it should be repeated (tiled), its size, and position.



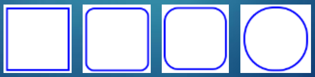
Appearance-based styles

- Font colour can be any solid color.
- Border styles have 3 parts:
  - Colour
  - Width
  - Line type (solid, dotted, etc.)



Appearance-based styles

- Corners can be square or rounded.
- Rounding values are usually in px.
- If you use really high rounding values, you can create a circle ☺
  - If width = height and the rounding value is at least half of that width.



Colours

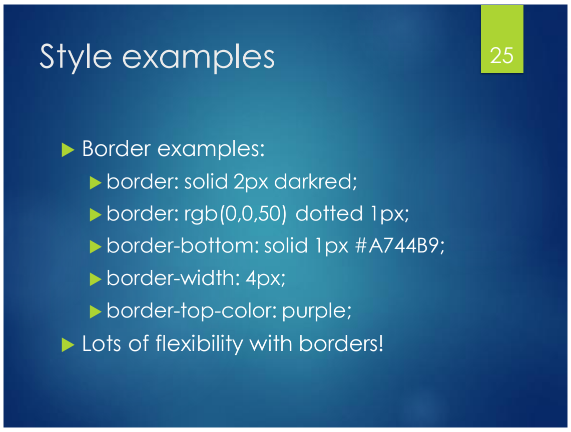
- Several style types are based on colour (i.e. background colour, font colour, border colour).
  - They can be hexadecimal or RGB codes. A lot of popular colours can also be called by name! Transparent is another option.
  - http://www.html-color-names.com/color-chart.php

Style examples

- How are styles actually set?
  - *property: value;*
- Examples:
  - width: 200px;
  - display: block;
  - position: absolute;

Style examples

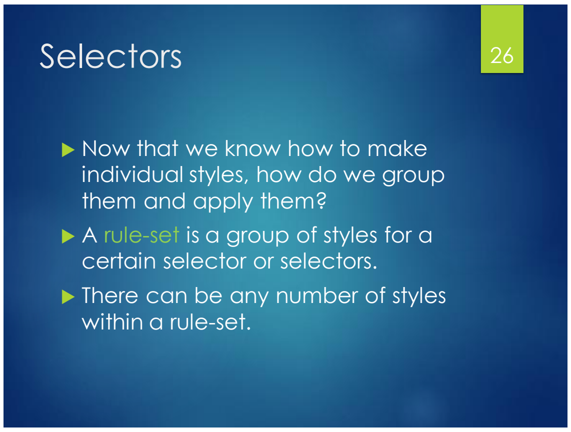
- Colour examples:
  - background-color: beige;
  - background-color: #9595AA
  - color: yellow;
  - color: #37B182
  - color: rgb(255,32,175)
- What is color vs. background-color?



Style examples

25

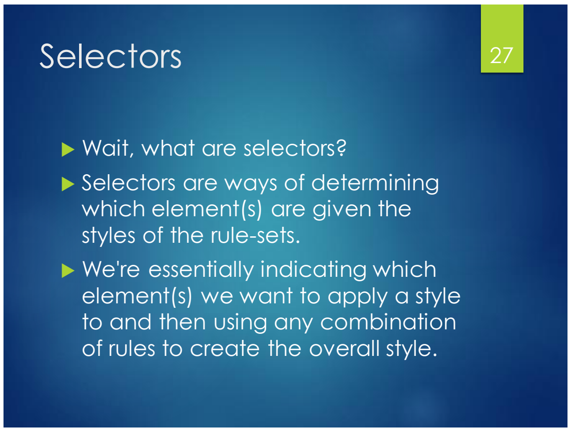
- Border examples:
  - border: solid 2px darkred;
  - border: rgb(0,0,50) dotted 1px;
  - border-bottom: solid 1px #A744B9;
  - border-width: 4px;
  - border-top-color: purple;
- Lots of flexibility with borders!



Selectors

26

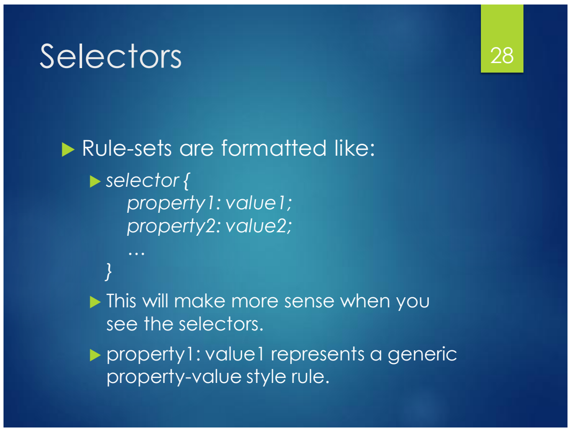
- Now that we know how to make individual styles, how do we group them and apply them?
- A rule-set is a group of styles for a certain selector or selectors.
- There can be any number of styles within a rule-set.



Selectors

27

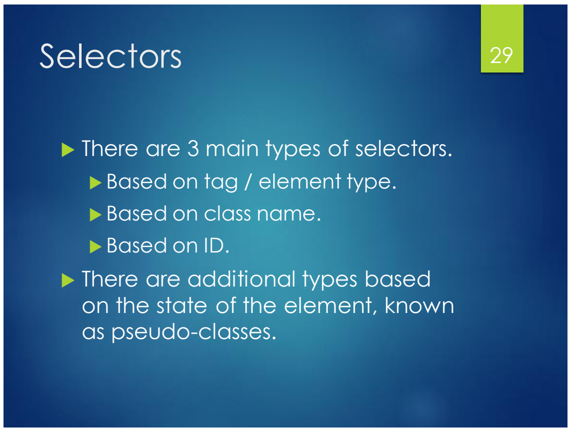
- Wait, what are selectors?
- Selectors are ways of determining which element(s) are given the styles of the rule-sets.
- We're essentially indicating which element(s) we want to apply a style to and then using any combination of rules to create the overall style.



Selectors

28

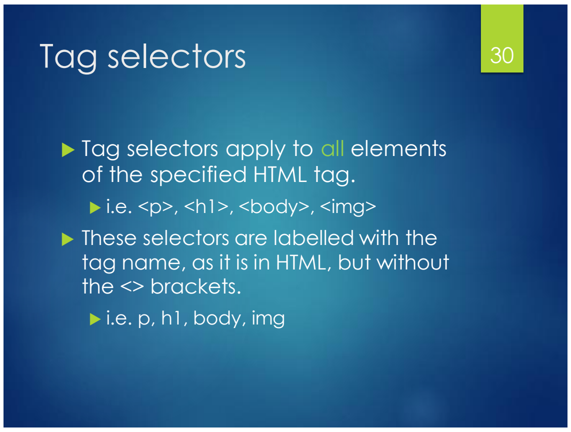
- Rule-sets are formatted like:
  - *selector {*
    property1: value1;
    property2: value2;
    …
    }
  - This will make more sense when you see the selectors.
  - property1: value1 represents a generic property-value style rule.



Selectors

29

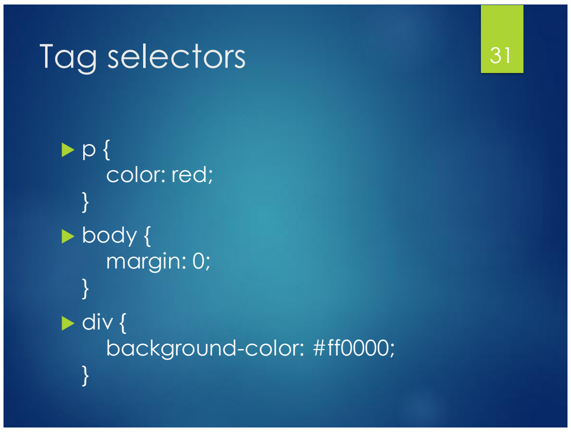
- There are 3 main types of selectors.
  - Based on tag / element type.
  - Based on class name.
  - Based on ID.
- There are additional types based on the state of the element, known as pseudo-classes.



Tag selectors

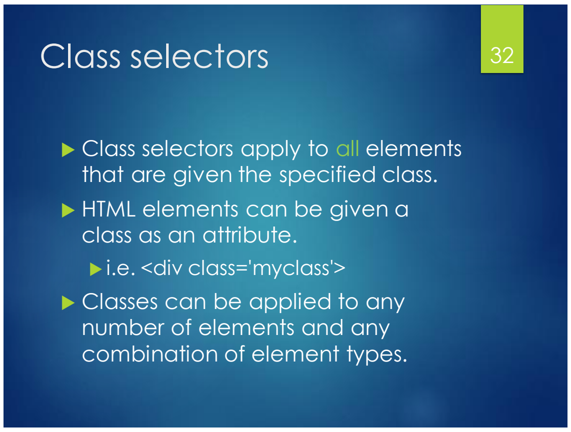
30

- Tag selectors apply to all elements of the specified HTML tag.
  - i.e. <p>, <h1>, <body>, <img>
- These selectors are labelled with the tag name, as it is in HTML, but without the <> brackets.
  - i.e. p, h1, body, img



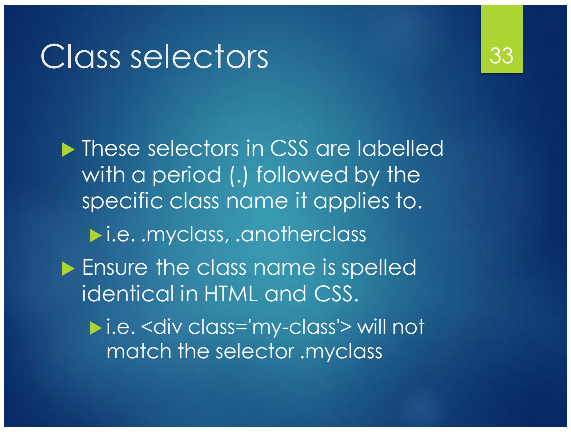
Tag selectors

```
▶ p {
    color: red;
  }
▶ body {
    margin: 0;
  }
▶ div {
    background-color: #ff0000;
  }
```



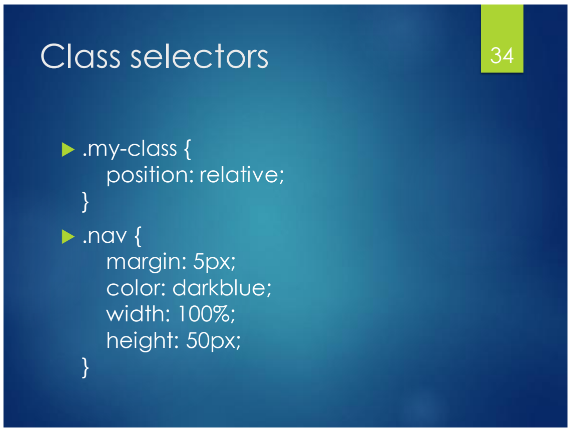
Class selectors

- Class selectors apply to all elements that are given the specified class.
- HTML elements can be given a class as an attribute.
  - i.e. <div class='myclass'>
- Classes can be applied to any number of elements and any combination of element types.



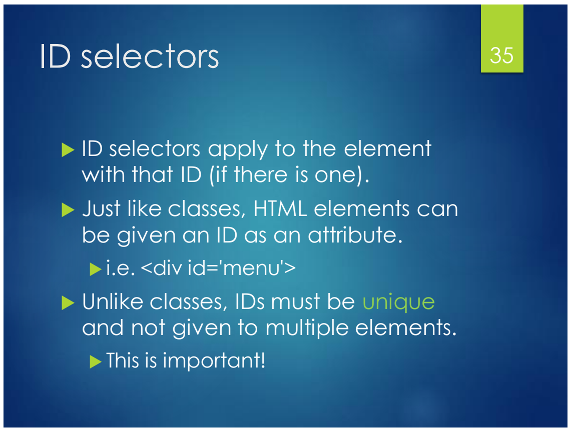
Class selectors

- These selectors in CSS are labelled with a period (.) followed by the specific class name it applies to.
  - i.e. .myclass, .anotherclass
- Ensure the class name is spelled identical in HTML and CSS.
  - i.e. <div class='my-class'> will not match the selector .myclass



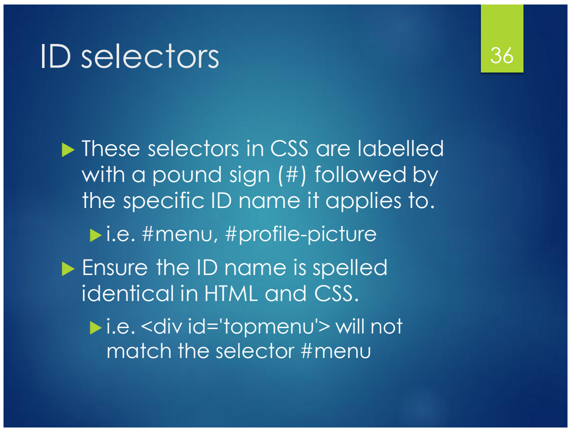
Class selectors

```
▶ .my-class {
    position: relative;
  }
▶ .nav {
    margin: 5px;
    color: darkblue;
    width: 100%;
    height: 50px;
  }
```



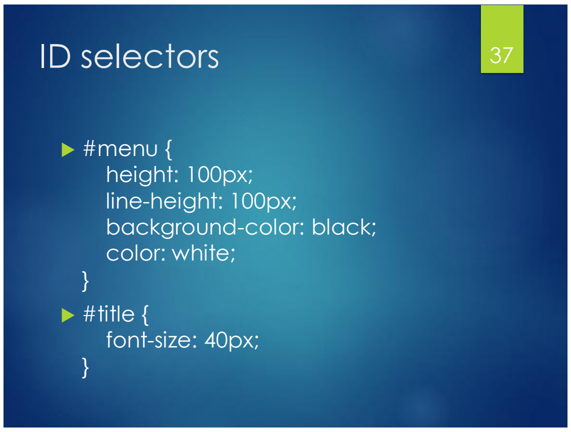
ID selectors

- ID selectors apply to the element with that ID (if there is one).
- Just like classes, HTML elements can be given an ID as an attribute.
  - i.e. <div id='menu'>
- Unlike classes, IDs must be unique and not given to multiple elements.
  - This is important!



ID selectors

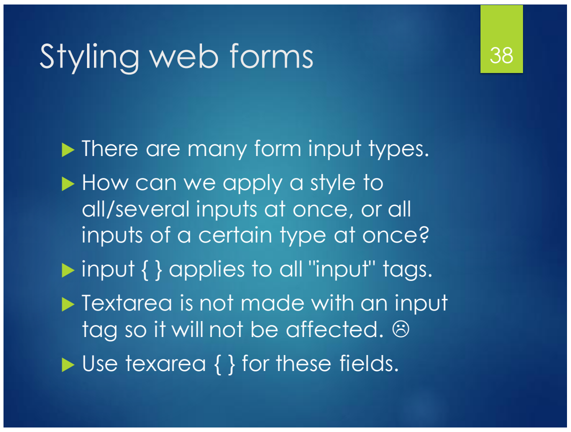
- These selectors in CSS are labelled with a pound sign (#) followed by the specific ID name it applies to.
  - i.e. #menu, #profile-picture
- Ensure the ID name is spelled identical in HTML and CSS.
  - i.e. <div id='topmenu'> will not match the selector #menu



ID selectors

37

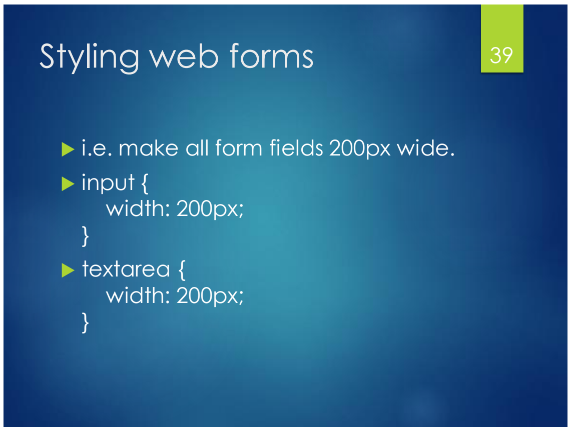
- #menu {
    height: 100px;
    line-height: 100px;
    background-color: black;
    color: white;
  }
- #title {
    font-size: 40px;
  }



Styling web forms

38

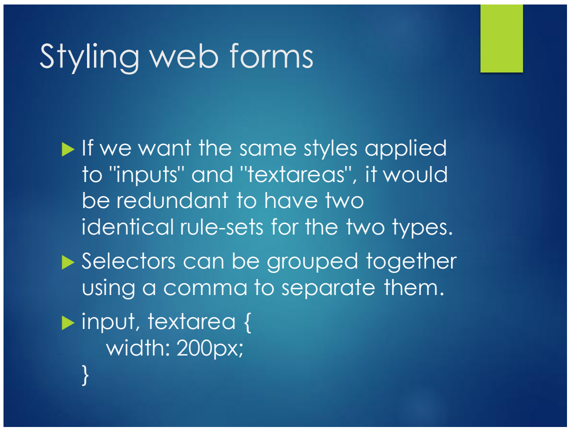
- There are many form input types.
- How can we apply a style to all/several inputs at once, or all inputs of a certain type at once?
- input { } applies to all "input" tags.
- Textarea is not made with an input tag so it will not be affected. ☹
- Use texarea { } for these fields.



Styling web forms

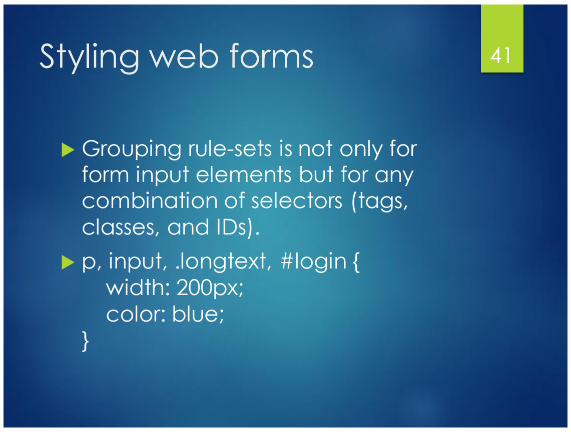
39

- i.e. make all form fields 200px wide.
- input {
    width: 200px;
  }
- textarea {
    width: 200px;
  }



Styling web forms

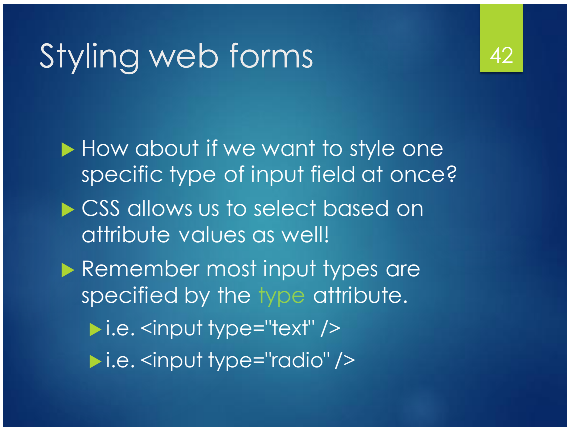
- If we want the same styles applied to "inputs" and "textareas", it would be redundant to have two identical rule-sets for the two types.
- Selectors can be grouped together using a comma to separate them.
- input, textarea {
    width: 200px;
  }



Styling web forms

41

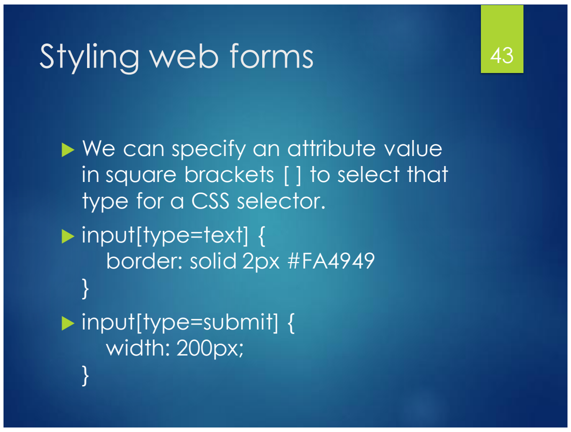
- Grouping rule-sets is not only for form input elements but for any combination of selectors (tags, classes, and IDs).
- p, input, .longtext, #login {
    width: 200px;
    color: blue;
  }



Styling web forms

42

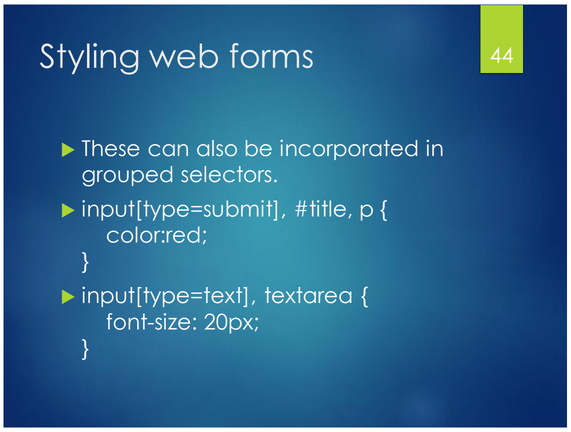
- How about if we want to style one specific type of input field at once?
- CSS allows us to select based on attribute values as well!
- Remember most input types are specified by the type attribute.
  - i.e. <input type="text" />
  - i.e. <input type="radio" />



Styling web forms

43

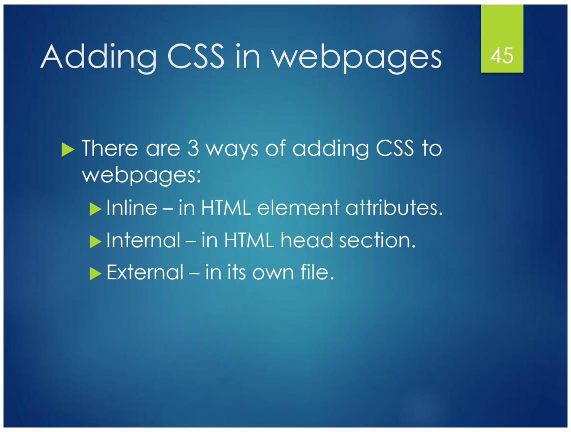
- We can specify an attribute value in square brackets [ ] to select that type for a CSS selector.
- input[type=text] {
    border: solid 2px #FA4949
  }
- input[type=submit] {
    width: 200px;
  }



Styling web forms

44

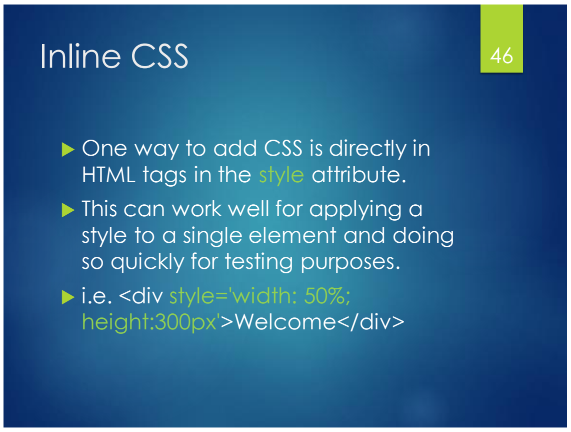
- These can also be incorporated in grouped selectors.
- input[type=submit], #title, p {
    color:red;
  }
- input[type=text], textarea {
    font-size: 20px;
  }



Adding CSS in webpages

45

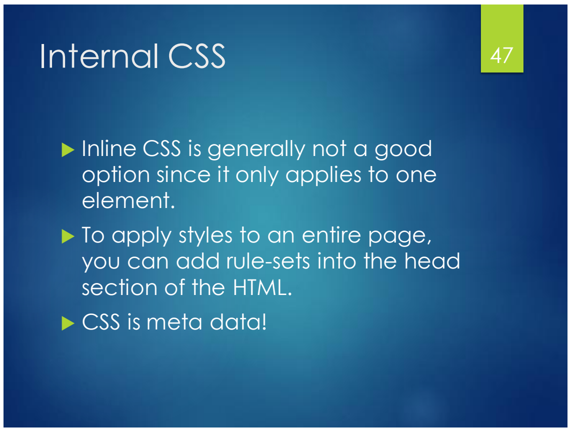
- There are 3 ways of adding CSS to webpages:
  - Inline – in HTML element attributes.
  - Internal – in HTML head section.
  - External – in its own file.



Inline CSS

46

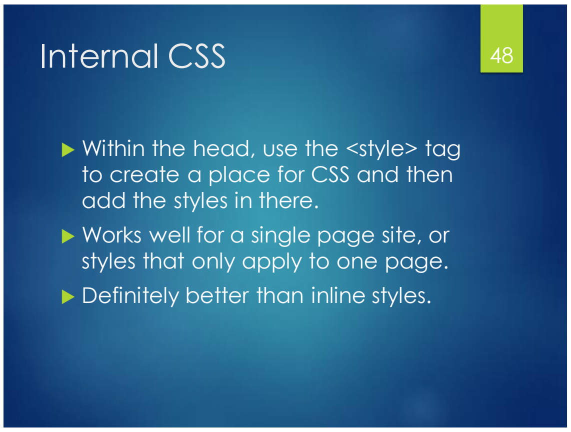
- One way to add CSS is directly in HTML tags in the style attribute.
- This can work well for applying a style to a single element and doing so quickly for testing purposes.
- i.e. <div style='width: 50%; height:300px'>Welcome</div>



Internal CSS

47

- Inline CSS is generally not a good option since it only applies to one element.
- To apply styles to an entire page, you can add rule-sets into the head section of the HTML.
- CSS is meta data!



Internal CSS

48

- Within the head, use the <style> tag to create a place for CSS and then add the styles in there.
- Works well for a single page site, or styles that only apply to one page.
- Definitely better than inline styles.

Internal CSS

```
<head>
<style>
  p { color: red; }
  div {
    width:300px;
    border: solid 2px red;
  }
</style>
</head>
```

External CSS

- However, internal CSS is still not completely efficient.
- Suppose you have a website with multiple pages and want the styles to apply to all pages.
- The best option is external CSS.
- Store the CSS in its own file(s) and link the webpages to the CSS file(s).

External CSS

- External CSS is stored in files with the .css extension.
- Linking these files into HTML pages is very simple:
  - <link rel="stylesheet" type="text/css" href="styles.css">
  - This is also meta information so it goes in the head section of the HTML.

External CSS

index.html

```
<html>
<head>
    <link rel='stylesheet' type='text/css' href='styles.css'>
</head>
<body>
```

styles.css

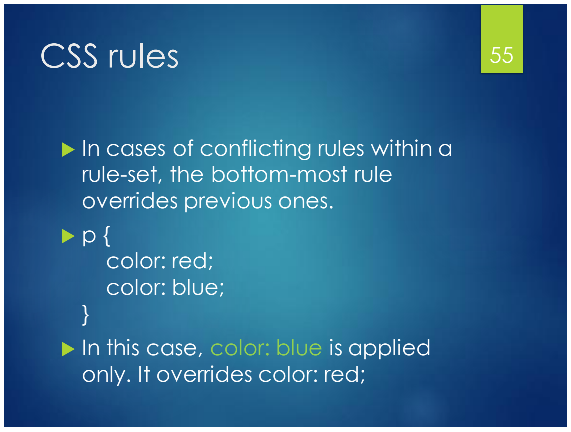
```
body {
    margin:0;
    padding:0;
    background-color:cyan;
}

p {
    color:yellow;
}

#main-title {
    font-size:45px;
}
```

CSS rules

- Styles are applied in top-to-bottom order generally.
- This only matters if there are conflicting rules or rule-sets.
- The order doesn't matter otherwise.
- p {color: red; width: 50px; } is the same as p {width: 50px; color: red; } since the rules are independent.

CSS rules

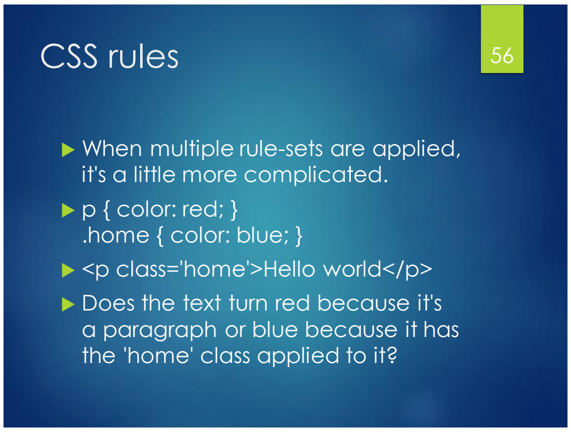
- So where does the order matter?
  - Conflicting rules within a rule-set.
  - Multiple rule-sets with conflicting styles applied to an element.
- Let's look at examples of each.



CSS rules

55

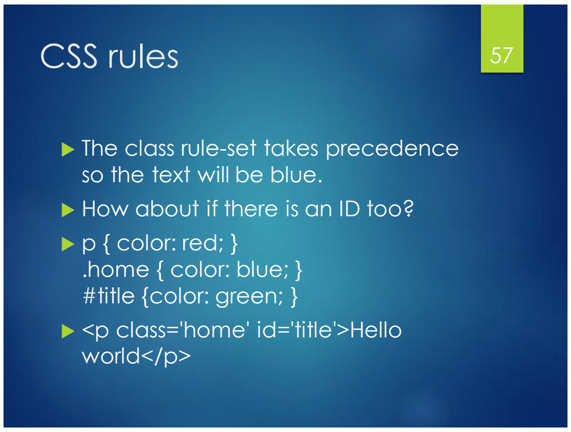
- In cases of conflicting rules within a rule-set, the bottom-most rule overrides previous ones.
- p {
      color: red;
      color: blue;
  }
- In this case, color: blue is applied only. It overrides color: red;



CSS rules

56

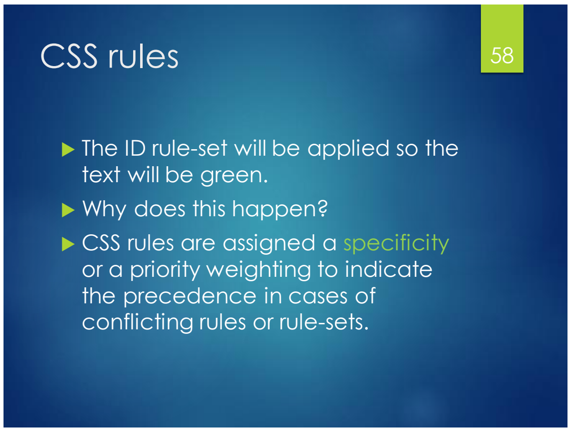
- When multiple rule-sets are applied, it's a little more complicated.
- p { color: red; }
  .home { color: blue; }
- <p class='home'>Hello world</p>
- Does the text turn red because it's a paragraph or blue because it has the 'home' class applied to it?



CSS rules

57

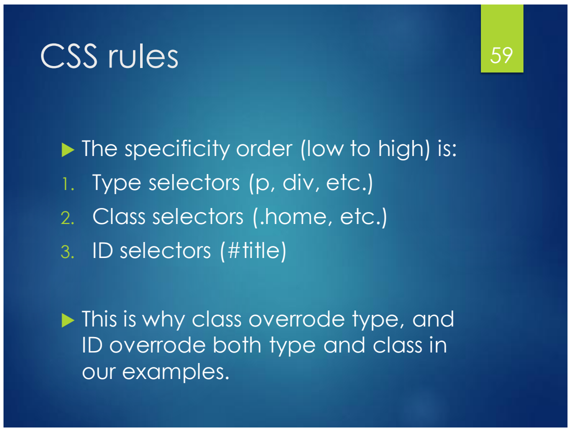
- The class rule-set takes precedence so the text will be blue.
- How about if there is an ID too?
- p { color: red; }
  .home { color: blue; }
  #title {color: green; }
- <p class='home' id='title'>Hello world</p>



CSS rules

58

- The ID rule-set will be applied so the text will be green.
- Why does this happen?
- CSS rules are assigned a specificity or a priority weighting to indicate the precedence in cases of conflicting rules or rule-sets.

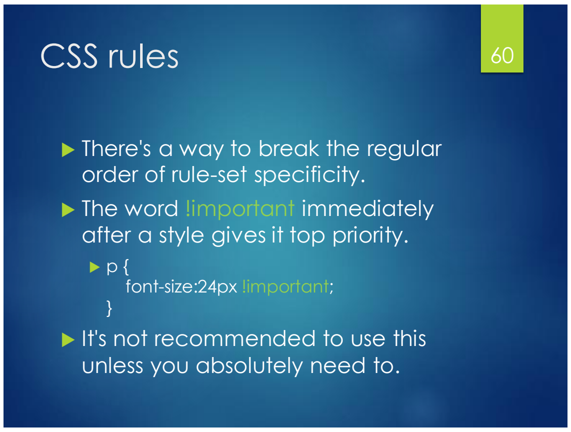


CSS rules

59

- The specificity order (low to high) is:
1. Type selectors (p, div, etc.)
2. Class selectors (.home, etc.)
3. ID selectors (#title)

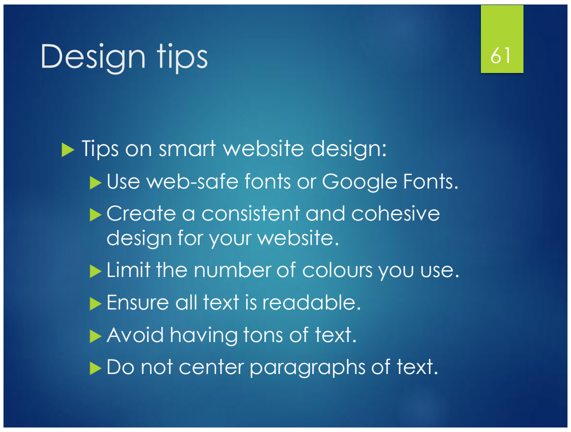
- This is why class overrode type, and ID overrode both type and class in our examples.



CSS rules

60

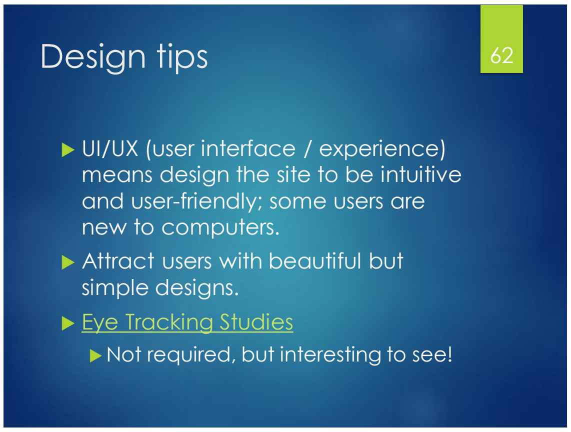
- There's a way to break the regular order of rule-set specificity.
- The word !important immediately after a style gives it top priority.
  - p {
        font-size:24px !important;
    }
- It's not recommended to use this unless you absolutely need to.



Design tips

61

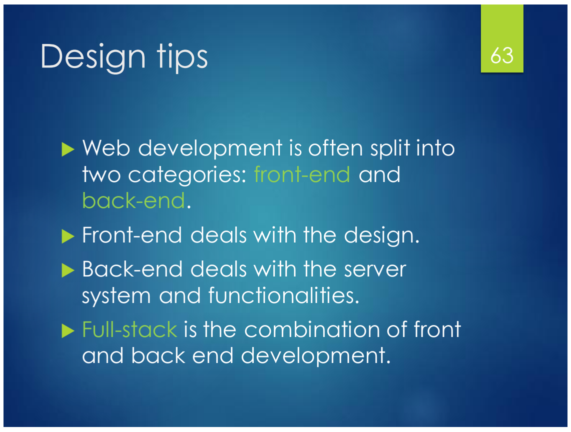
- Tips on smart website design:
  - Use web-safe fonts or Google Fonts.
  - Create a consistent and cohesive design for your website.
  - Limit the number of colours you use.
  - Ensure all text is readable.
  - Avoid having tons of text.
  - Do not center paragraphs of text.



Design tips

62

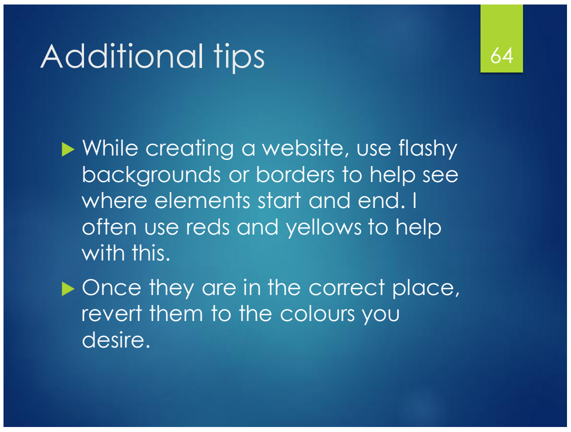
- UI/UX (user interface / experience) means design the site to be intuitive and user-friendly; some users are new to computers.
- Attract users with beautiful but simple designs.
- Eye Tracking Studies
  - Not required, but interesting to see!



Design tips

63

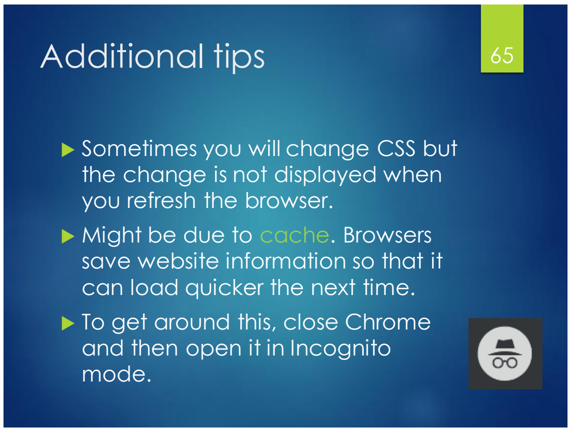
- Web development is often split into two categories: front-end and back-end.
- Front-end deals with the design.
- Back-end deals with the server system and functionalities.
- Full-stack is the combination of front and back end development.



Additional tips

64

- While creating a website, use flashy backgrounds or borders to help see where elements start and end. I often use reds and yellows to help with this.
- Once they are in the correct place, revert them to the colours you desire.



Additional tips

65

- Sometimes you will change CSS but the change is not displayed when you refresh the browser.
- Might be due to cache. Browsers save website information so that it can load quicker the next time.
- To get around this, close Chrome and then open it in Incognito mode.