6.1040 Rec 7

🏗️ HTML & CSS 🎨

Plan for today

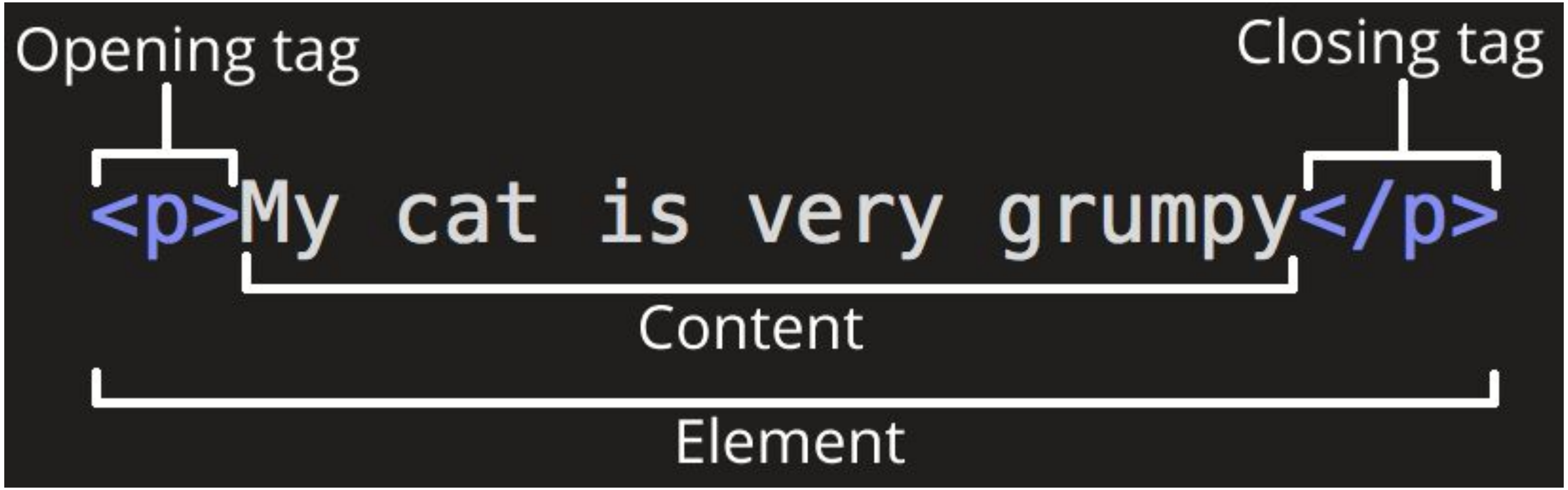
1. HTML (+ exercise)
2. Intro to CSS
3. Layout in CSS (+ exercise)

What is HTML?

- **H**yper**T**ext **M**arkup **L**anguage
  - a.k.a. A structure to mark up webpages so they're easier to format and navigate
- Made up of nested elements

```
--ams-region-start
div class="user-helper-footer"
  <div class="container">
    <div class="col-sm-30
      <div class="alert-subscribe-form"
        <h3>Subscription</h3>
        <input class="alert-subscribe-input"
        div class="email-error-tips">
          </div>
```

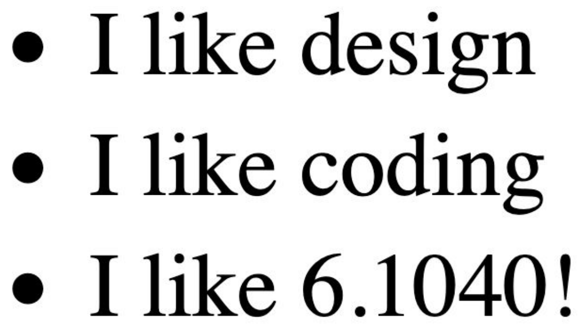
A single HTML element



```
<p>My cat is very grumpy</p>
```

Nested HTML elements

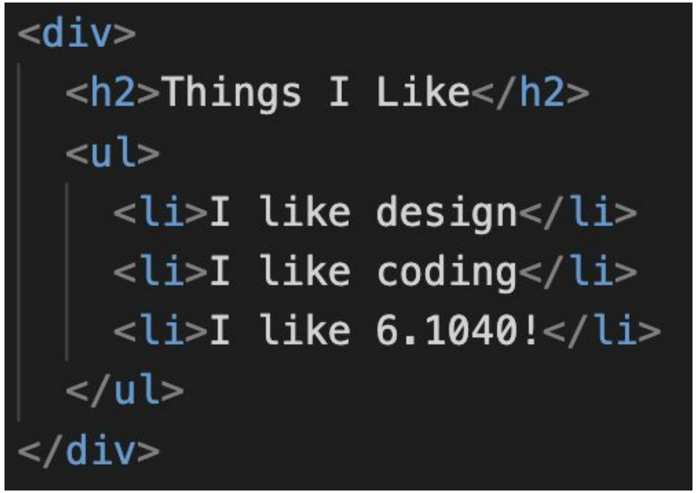
```
<ul>

  <li>I like design</li>

  <li>I like coding</li>

  <li>I like 6.1040!</li>

</ul>
```



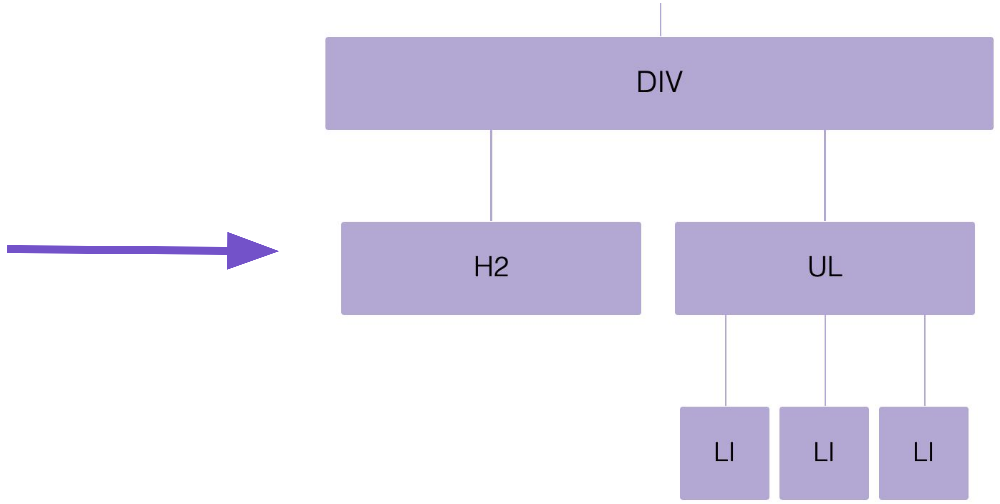
- I like design
- I like coding
- I like 6.1040!

What is the DOM?

- **D**ocument **O**bject **M**odel
    - Think of a webpage not just as a box of boxes, but as a tree with child nodes



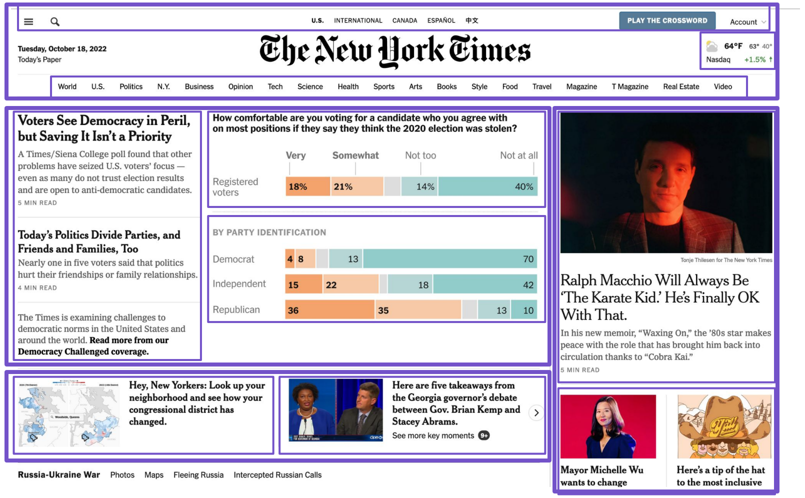
```
<div>
  <h2>Things I Like</h2>
  <ul>
    <li>I like design</li>
    <li>I like coding</li>
    <li>I like 6.1040!</li>
  </ul>
</div>
```



(Generated with https://codepen.io/pavlovsk/pen/QKGpQr)

Why use HTML?

- Ties page *structure* to page *semantics* (what it actually represents):
  - Changing element types changes functionality
  - Can apply same code (e.g. formatting) to all elements of the same type
- Nested style reflects how we think about webpages



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Tuesday, October 18, 2022
Today's Paper

The New York Times

64°F 63° 40°
Nasdaq +1.5%

World U.S. Politics N.Y. Business Opinion Tech Science Health Sports Arts Books Style Food Travel Magazine T Magazine Real Estate Video

Voters See Democracy in Peril, but Saving It Isn't a Priority
A Times/Siena College poll found that other problems have seized U.S. voters' focus — even as many do not trust election results and are open to anti-democratic candidates.
5 MIN READ

Today's Politics Divide Parties, and Friends and Families, Too
Nearly one in five voters said that politics hurt their friendships or family relationships.
4 MIN READ

The Times is examining challenges to democratic norms in the United States and around the world. **Read more from our Democracy Challenged coverage.**

How comfortable are you voting for a candidate who you agree with on most positions if they say they think the 2020 election was stolen?

	Very	Somewhat	Not too	Not at all
Registered voters	18%	21%	14%	40%

BY PARTY IDENTIFICATION

	Very	Somewhat	Not too	Not at all
Democrat	4	8	13	70
Independent	15	22	18	42
Republican	36	35	13	10

Tonje Thilesen for The New York Times

Ralph Macchio Will Always Be 'The Karate Kid.' He's Finally OK With That.
In his new memoir, "Waxing On," the '80s star makes peace with the role that has brought him back into circulation thanks to "Cobra Kai."
5 MIN READ

Hey, New Yorkers: Look up your neighborhood and see how your congressional district has changed.

Here are five takeaways from the Georgia governor's debate between Gov. Brian Kemp and Stacey Abrams.
See more key moments 9+

Mayor Michelle Wu wants to change

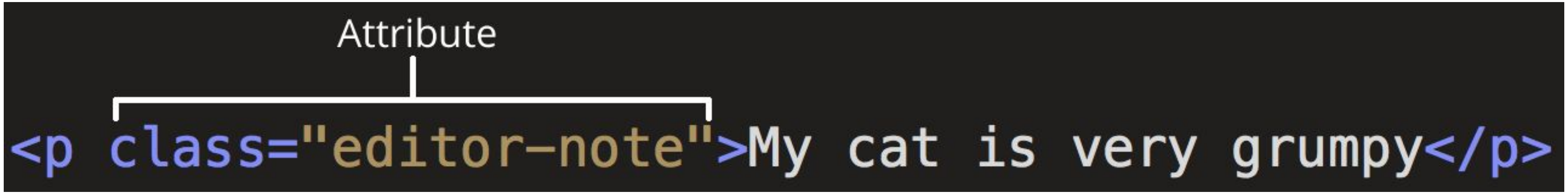
Here's a tip of the hat to the most inclusive

Russia-Ukraine War Photos Maps Fleeing Russia Intercepted Russian Calls

Basic elements 1

- Headers: `<h1>, <h2>, <h3>, <h4>`
- Paragraph: `<p>`
- Generic container: `<div>`
- Inline container: `<span>`

Attributes in HTML

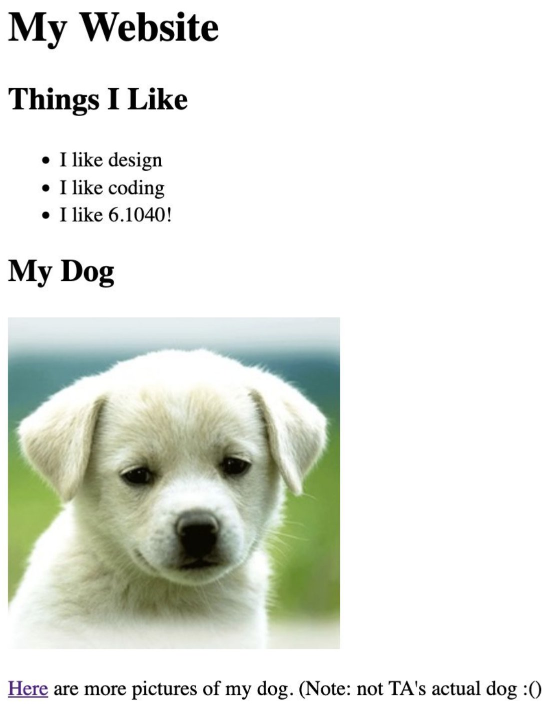


```
<p class="editor-note">My cat is very grumpy</p>
```

- `class` attribute: makes a new element group (e.g. splitting out notes from the main text)
- `id` attribute: **unique** to the element within the entire file/page
- Other kinds of attribute which may depend on the element type

Basic elements 2

- Link: `<a href=" ">`
- Image: `<img src=" ">`
  - Link and image have special attributes
  - Can be absolute or relative paths
- Tons more elements! Reference links at the end



My Website

Things I Like

- I like design
- I like coding
- I like 6.1040!

My Dog

Here are more pictures of my dog. (Note: not TA's actual dog :()

Document structure

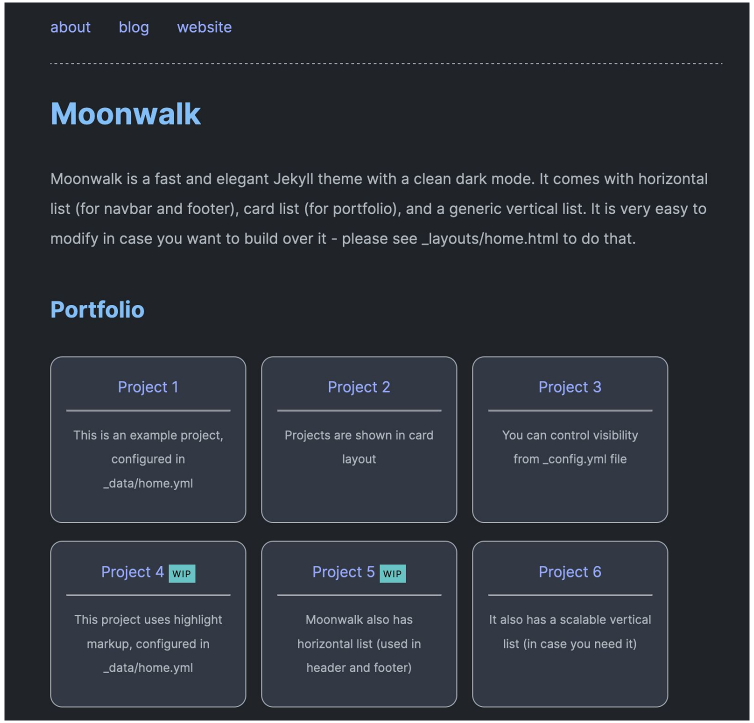
Every HTML document starts with boilerplate:

```html
<!DOCTYPE html>
<html lang="en-US">
  <head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width" />
    <title>My test page</title>
  </head>
  <body>


  </body>
</html>
```

Exercise: recreating a theme

The original Jekyll theme



about blog website

Moonwalk

Moonwalk is a fast and elegant Jekyll theme with a clean dark mode. It comes with horizontal list (for navbar and footer), card list (for portfolio), and a generic vertical list. It is very easy to modify in case you want to build over it - please see _layouts/home.html to do that.

Portfolio

Project 1 — This is an example project, configured in _data/home.yml

Project 2 — Projects are shown in card layout

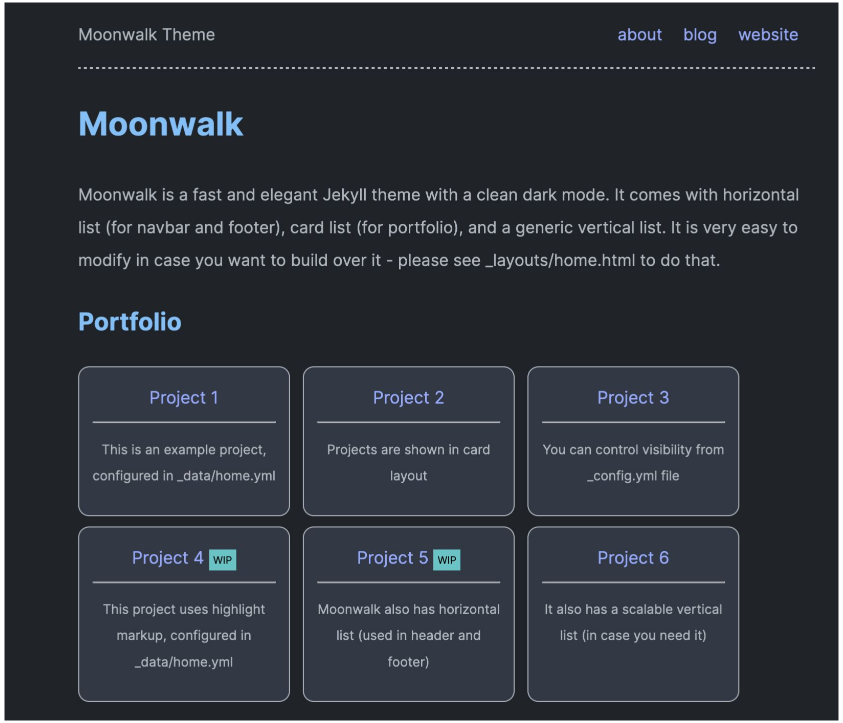
Project 3 — You can control visibility from _config.yml file

Project 4 WIP — This project uses highlight markup, configured in _data/home.yml

Project 5 WIP — Moonwalk also has horizontal list (used in header and footer)

Project 6 — It also has a scalable vertical list (in case you need it)

Our recreation



Moonwalk Theme about blog website

Moonwalk

Moonwalk is a fast and elegant Jekyll theme with a clean dark mode. It comes with horizontal list (for navbar and footer), card list (for portfolio), and a generic vertical list. It is very easy to modify in case you want to build over it - please see _layouts/home.html to do that.

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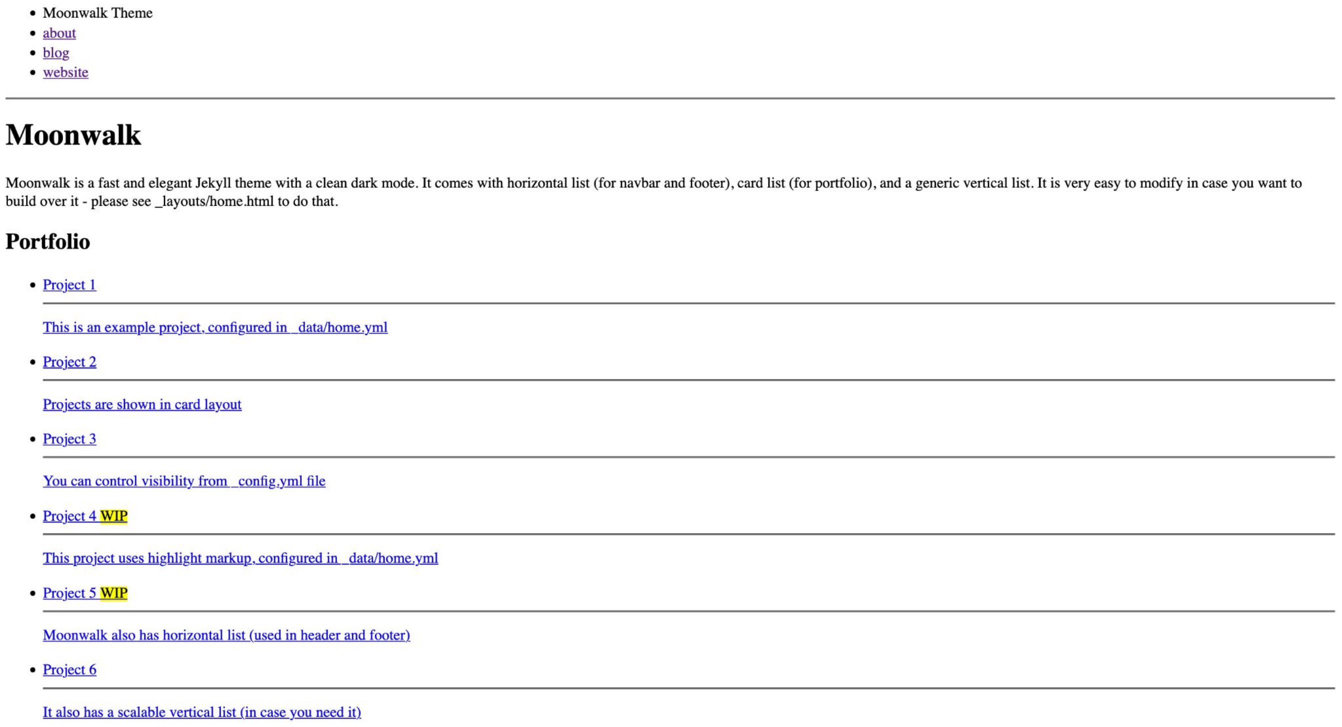
Exercise!

Start by just trying to recreate the HTML. We'll do style next! (Hint: try <hr> for the lines)



- Moonwalk Theme
- about
- blog
- website

Moonwalk

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- Project 5 WIP

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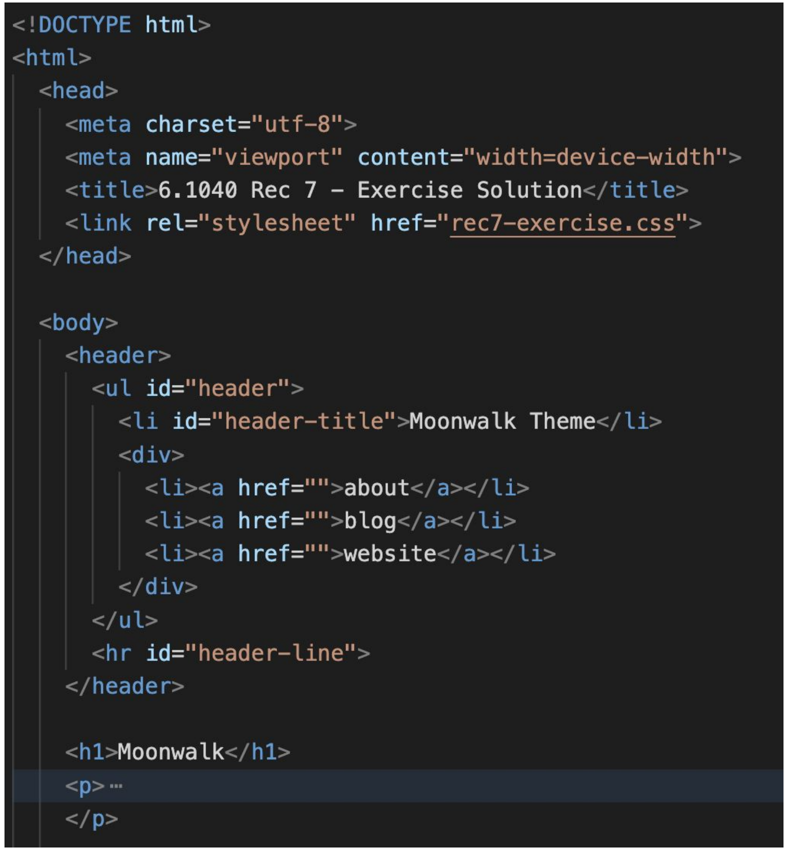
- Project 6

  It also has a scalable vertical list (in case you need it)

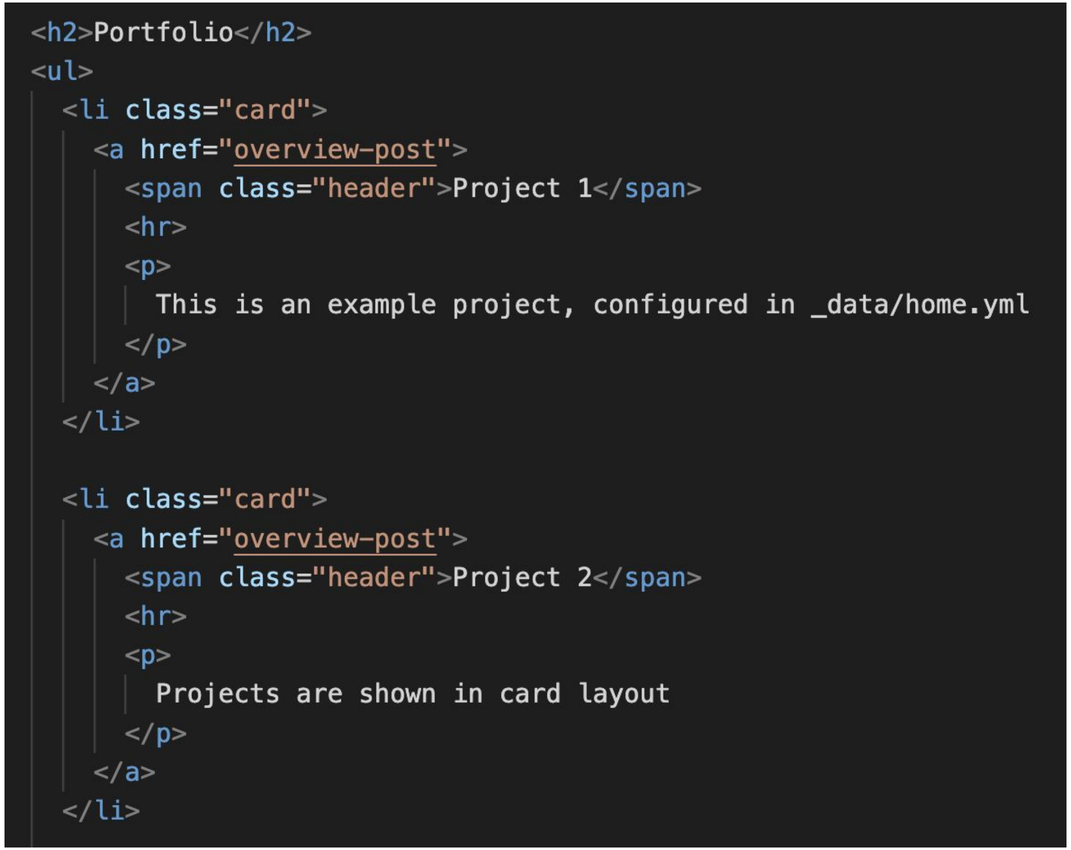
Solution Outline



```html
<!DOCTYPE html>
<html>
  <head>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width">
    <title>6.1040 Rec 7 - Exercise Solution</title>
    <link rel="stylesheet" href="rec7-exercise.css">
  </head>

  <body>
    <header>
      <ul id="header">
        <li id="header-title">Moonwalk Theme</li>
        <div>
          <li><a href="">about</a></li>
          <li><a href="">blog</a></li>
          <li><a href="">website</a></li>
        </div>
      </ul>
      <hr id="header-line">
    </header>

    <h1>Moonwalk</h1>
    <p>⋯
    </p>
```

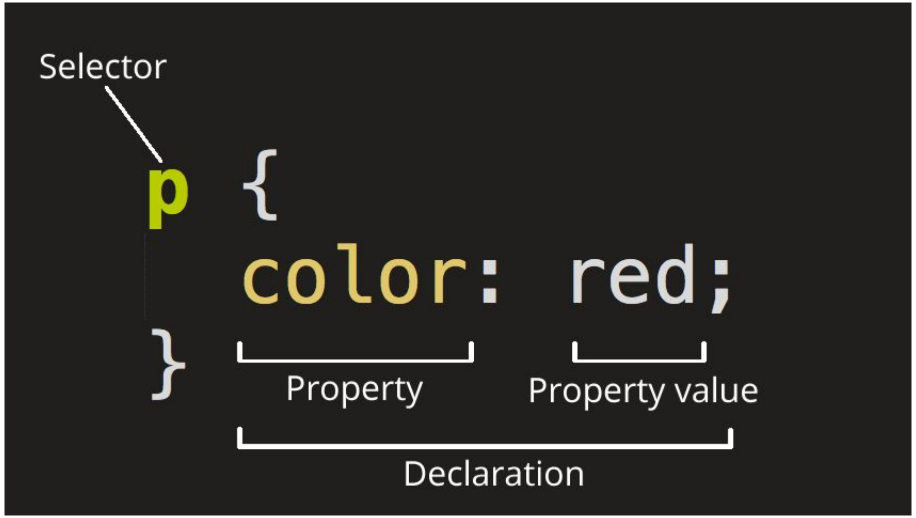


```html
<h2>Portfolio</h2>
<ul>
  <li class="card">
    <a href="overview-post">
      <span class="header">Project 1</span>
      <hr>
      <p>
        This is an example project, configured in _data/home.yml
      </p>
    </a>
  </li>

  <li class="card">
    <a href="overview-post">
      <span class="header">Project 2</span>
      <hr>
      <p>
        Projects are shown in card layout
      </p>
    </a>
  </li>
```

Intro to CSS

- **C**ascading **S**tyle **S**heets
  - The thing that makes HTML look pretty!
- A set of rules, each of which affects a particular element or type of element



```
p {
  color: red;
}
```

What can rules apply to?

- Three main things:
  - Selectors, a.k.a. tag names: `p`
  - Classes, with a `.`: `.classname`
  - IDs, with a `#`: `#idname`
- Other more complicated techniques, but we'll set those aside for now
- One rule can apply to more than one thing:

```
p,
h1 {
  color: red;
}
```

What can rules do?

- So. Many. Things.
- Some basics to get you started:
  - `color: red; color: #5203fc;`
  - `height/width/font-size: 20px;`
  - `border: 1px solid black;`
- Units can be confusing! Stick to the simplest ones:
  - `px` is pixels
  - `em` is the font size (so you can define other things relative to the font)
  - `%` is the percent of the parent element’s size

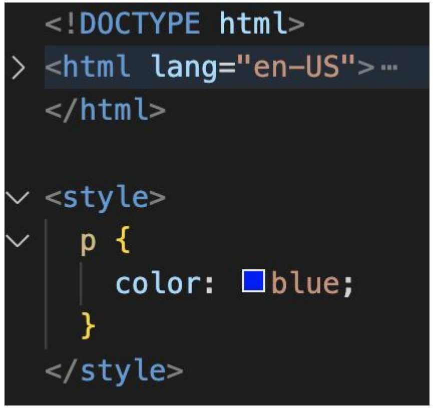
How to add CSS to HTML

1. **Inline**: Include it directly in the HTML.

   ```
   <p style="color: red; font-size: 20px">Hi!</p>
   ```

   Never do this. Not modular, hard to change, hard to notice.

2. **Internal**: Include it in the file after the HTML. $\longrightarrow$

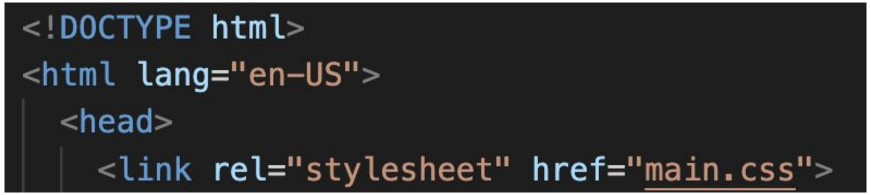
   

   ```
   <!DOCTYPE html>
   <html lang="en-US">…
   </html>

   <style>
     p {
       color: blue;
     }
   </style>
   ```

   Not recommended. Not that modular, but OK for debugging.

3. **External**: Include it as a separate file.

   ```
   <!DOCTYPE html>
   <html lang="en-US">
     <head>
       <link rel="stylesheet" href="main.css">
   ```

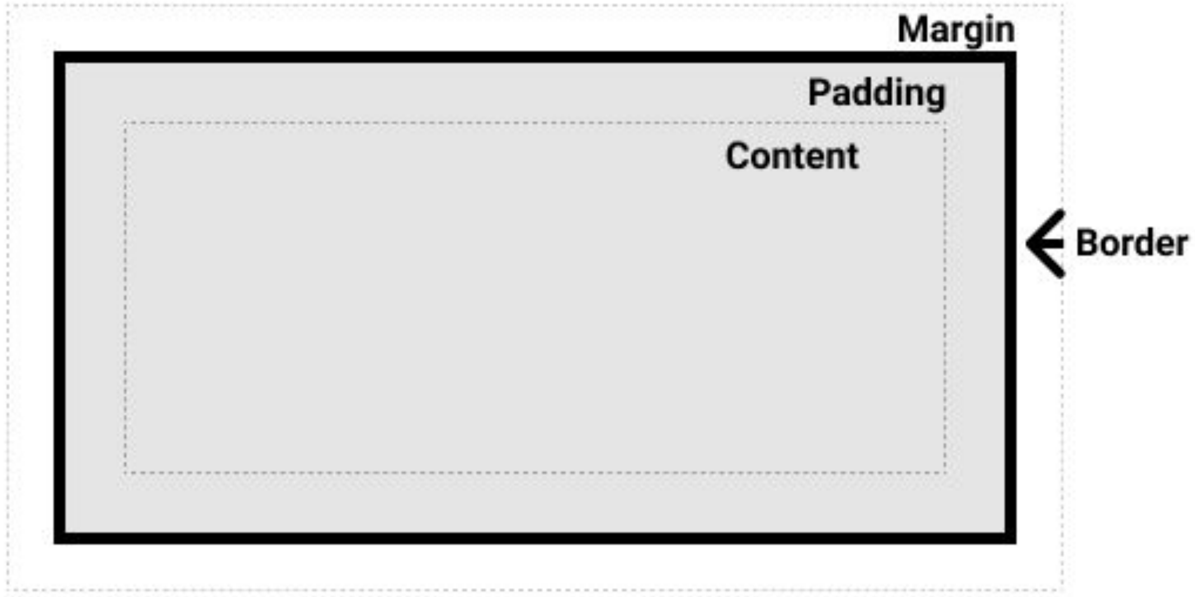
   Best practice! Most modular, most common.

Layout in CSS

- The properties we’ve seen so far mostly change elements’ *appearance*, but you can also change their *position*
- Very complicated topic! Multiple systems for approaching layout and many resources on the internet
- We will touch on the main systems and give you some links for learning and practicing

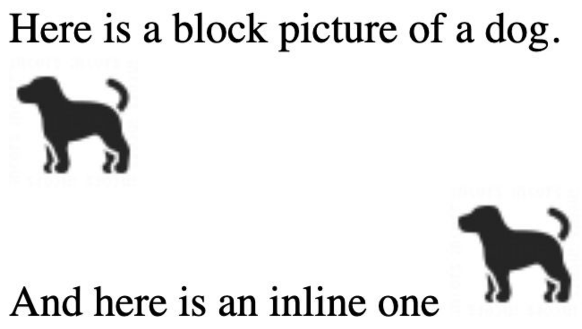
The box model

- HTML was “boxes in boxes”. CSS is *literally* boxes in boxes



Positioning basics

- We will only skim:
  - Easier than other systems we will spend more time on
  - Often, not very helpful for solving your problems
- Main important property: `display`
  - Controls which layout system (or composition of systems) is being used.
  - Basic: `inline` or `block`
  - More complicated: that’s up next

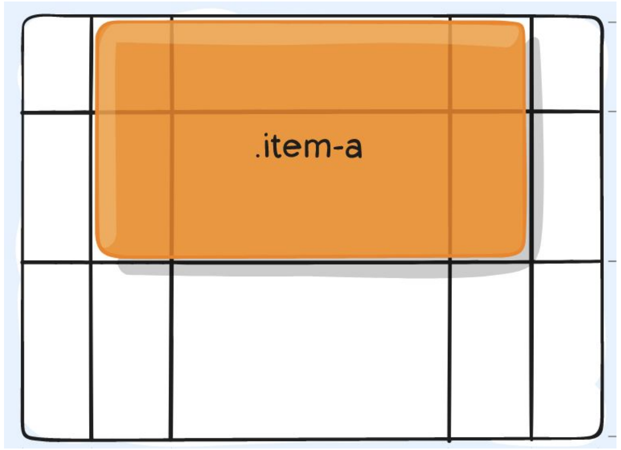


Here is a block picture of a dog.

And here is an inline one

Layout system 1: Grid

- Both of these systems apply to a parent element, then allow you to set the layout of the child elements
- Grid layout applies a grid on top of your parent element. Then you specify which cells each child occupies

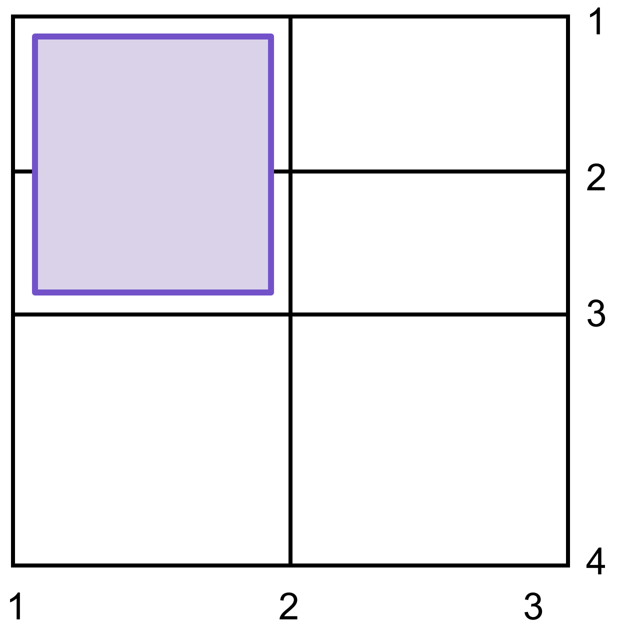


Grid layout syntax

```
#parent {
  display: grid;
  grid-template-columns: 1fr 1fr;
  grid-template-rows: 1fr 1fr 2fr;
}
#child {
     grid-column: 1 / 2;
     grid-row: 1 / 3;
}
```

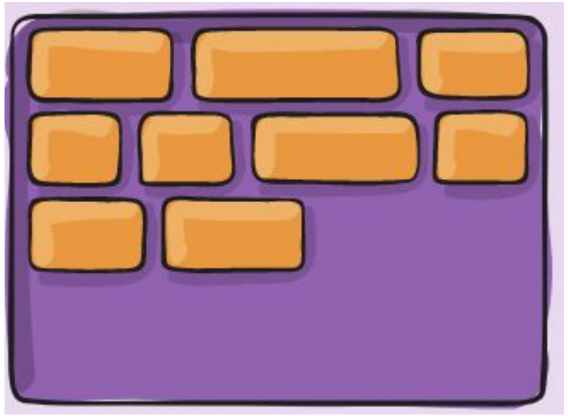
fr = "fraction"

counting by grid lines



Layout system 2: flexbox

- Grid is great for carefully positioning items of varying size and varying location
- Often, you want to put similar items in some rows and have it Just Work™
- Flexbox is perfect for that! Lots of use cases
- Another benefit: has easy centering options, unlike basic CSS



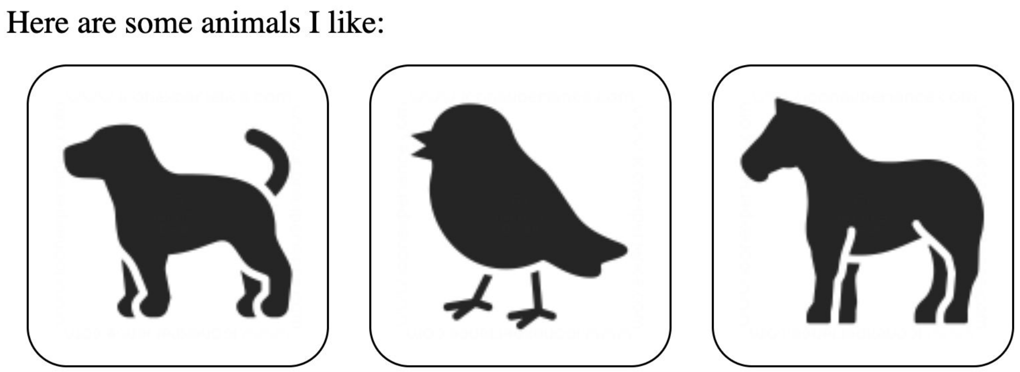
Flexbox syntax

```
#parent {

  display: flex;

}
```

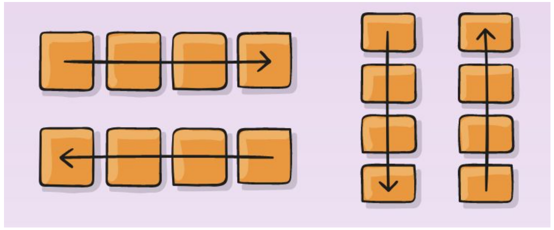
That's it!

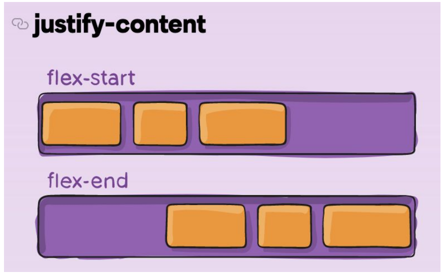


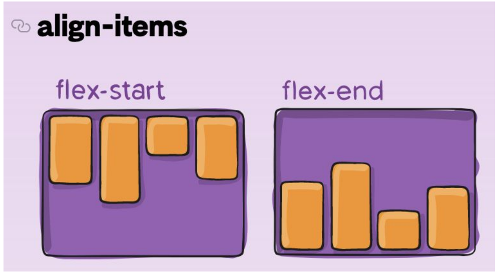
Here are some animals I like:

Flexbox syntax

- OK, there are some more options. Most important: setting the **axis**
- `flex-direction`: default is `row` axis, but can also set to `column`, `row-reverse`, `column-reverse`
- You can choose how items are aligned along the main axis with `justify-content` and the secondary axis with `align-items`
  - Lots of options!

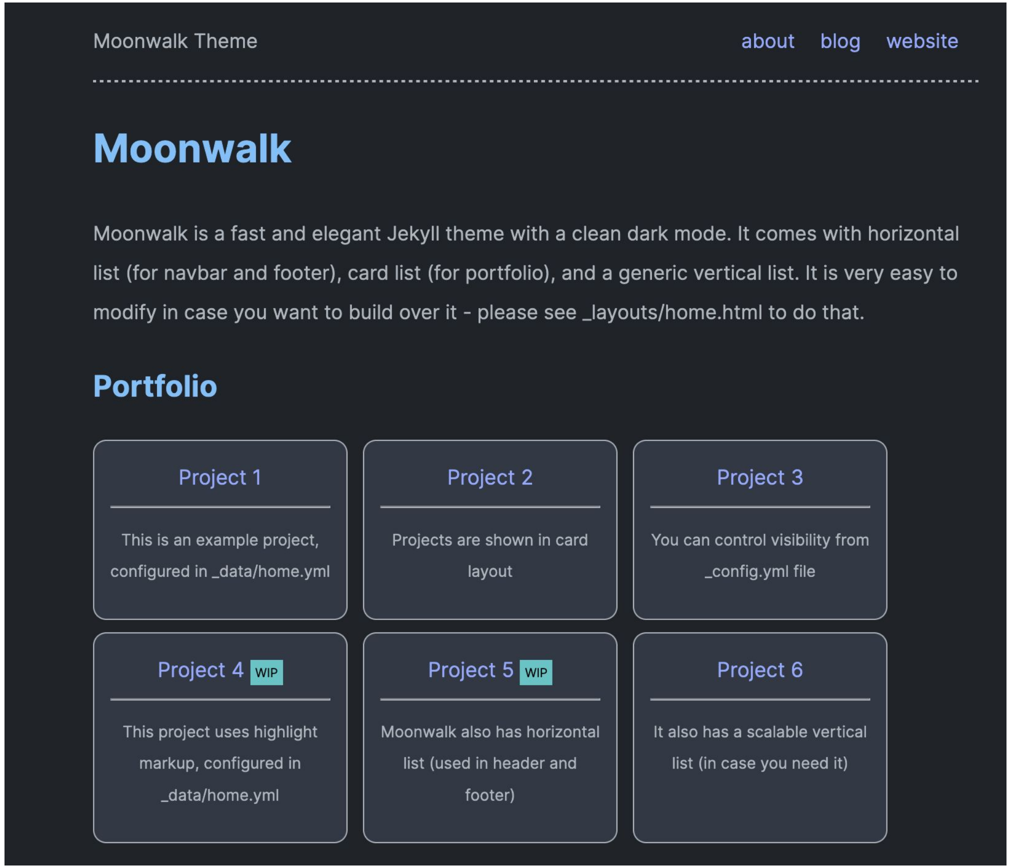






Exercise!

Now let’s do styling for the same page! Try to recreate it as closely as you can (don’t worry too much about getting the exact font or color).



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Moonwalk also has horizontal list (used in header and footer)

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It also has a scalable vertical list (in case you need it)

References (you might recognize some images!)

- HTML elements: https://developer.mozilla.org/en-US/docs/Web/HTML/Element
  - Semantic elements (helpful for A6): https://developer.mozilla.org/en-US/docs/Glossary/Semantics#semantic_elements
- CSS styles: https://developer.mozilla.org/en-US/docs/Web/CSS/Reference
- Guides:
  - https://developer.mozilla.org/en-US/docs/Learn/Getting_started_with_the_web/HTML_basics
  - https://developer.mozilla.org/en-US/docs/Learn/Getting_started_with_the_web/CSS_basics
  - https://developer.mozilla.org/en-US/docs/Learn/CSS/CSS_layout

References (you might recognize some images!)

- Fun interactive tutorials:
  - https://flexboxfroggy.com/
  - https://css-tricks.com/guides/ (grid, flexbox, and many others! Very helpful pictures)