SPA UI:
Data Presentation Layout

IT 4403 Advanced Web and Mobile Applications

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Overview

- Basic styles of data presentation layouts
  - List
  - Grid
  - Table

- Basic CSS flexbox techniques for data layouts

- Use client templates to bind layout and JSON

Presenting Search Results

- In this class, we focus on applications to work with data APIs. A common front-end design is to present search results and then lead to data item details on selecting an item from the results.

- Two essential designs
  - How to present search results (listing data items with limited information for a quick overview) – module 8
  - How to interact with search results – module 9

- All user actions and page content updates happen is the same page.

Basic Data Presentation Layouts

- https://uxmag.com/articles/designing-search-results-pages

| Table	• Strict rows and columns, with headers • Each row is typical for one data item (record)
Grid	• Exact grid with rows and columns (each cell is one data item) • Tiles (cells) with different sizes • Horizontal or vertical flow of items
Flow list	• A single column/row of items

Three Display Layouts for Files

Table

Name	Date modified	Type	Size	Availability
1.db-query.php	2/12/2015 11:59 PM	PHP File	2 KB	Available offline
2.single-item.php	2/12/2015 10:43 PM	PHP File	2 KB	Available offline
3.search.php	2/12/2015 11:22 PM	PHP File	2 KB	Available offline
4.insert.php	2/13/2015 12:05 A...	PHP File	2 KB	Available offline
5.update.php	2/16/2015 11:49 A...	PHP File	1 KB	Available offline
dbconnection.php	2/16/2015 12:08 PM	PHP File	1 KB	Available offline

Flow List

1.db-query.php
Type: PHP File
Date modified: 2/12/2015 11:59 PM
Size: 1.51 KB

2.single-item.php
Type: PHP File
Date modified: 2/12/2015 10:43 PM
Size: 1.27 KB

3.search.php
Type: PHP File
Date modified: 2/12/2015 11:22 PM
Size: 1.55 KB

4.insert.php
Type: PHP File
Date modified: 2/13/
Size: 1.11 KB

5.update.php
Type: PHP File
Date modified: 2/16/
Size: 893 bytes

dbconnection.php
Type: PHP File
Date modified: 2/16/
Size: 216 bytes

Grid

1.db-query.php

2.single-item.php

3.search.php

4.insert.php

5.update.php

dbconnection.ph
p

5
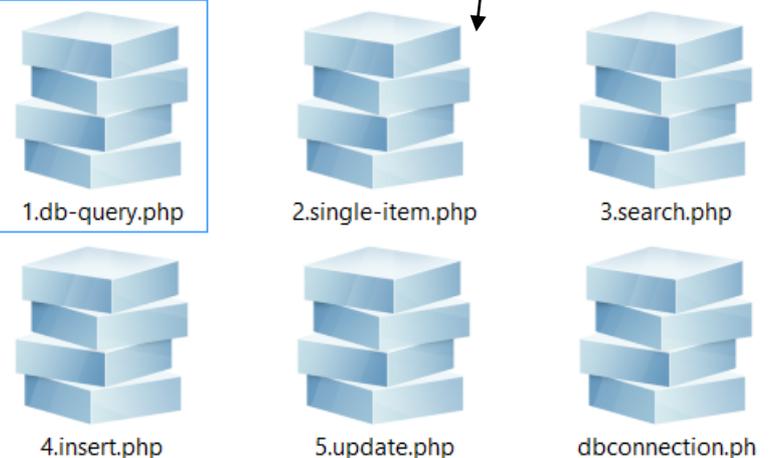
Data Table

- Show collection of items with multiple attributes in a data table to make the data easy to scan, analyze, and customize.
  - https://www.patternfly.org/v3/pattern-library/content-views/table-view/

- Variations
  - Simple table
  - Cards in table; more formatting in cells

- Live web examples
  - http://apps.atl.com/Passenger/FlightInfo/Search.aspx?FIDSType=A
  - http://finance.yahoo.com/quote/%5EDJI/components

- Design patterns and best practices
  - https://www.google.com/design/spec/components/data-tables.html
  - http://www.jankoatwarpspeed.com/ultimate-guide-to-table-ui-patterns/
  - http://ui-patterns.com/patterns/AlternatingRowColors

- Some plug-ins
  - https://datatables.net
  - http://js-grid.com
  - http://www.jqwidgets.com/jquery-widgets-demo/demos/jqxgrid/
  - http://www.jqwidgets.com/jquery-widgets-demo/demos/jqxdatatable/index.htm

Flow List

- Flow list and grid are more flexible in arranging information. Each list/grid item can have more complex layout itself.
  - https://www.patternfly.org/v3/pattern-library/content-views/list-view/

- Variations
  - Simple list
  - More formatted list, cards

- Some more examples
  - Simple list: http://atlanta.craigslist.org/cta/ (click on the "list" view link)
  - More complicated flow list: http://atlanta.craigslist.org/cta (click on the "thumb" view link)
  - https://www.apmex.com/search?q=eagles&vt=l
  - http://camelcamelcamel.com/search?sq=shoe

- Google's design practice on mobile
  - https://www.google.com/design/spec/components/lists.html

Grid

- Grid is similar to list but with multiple columns.
  - https://www.patternfly.org/v3/pattern-library/content-views/card-view/

- Live web examples
  - http://atlanta.craigslist.org/cta (click on the "gallery" view link)
  - http://www.newegg.com/Store/Category.aspx?Category=19

- Design practices
  - https://www.google.com/design/spec/components/grid-lists.html

Cards

- Items in both flow list and grid can use a design concept called "card".
  - A card is like a small page with more complex layout within.
  - A container can arrange multiple cards in different layout, such as flow list or grid.

- Card is Google's term to describe the small region to display all information about a data item
  - https://www.google.com/design/spec/components/cards.html

- Examples
  - Amazon
  - Apmex

- Why cards?
  - https://blog.intercom.com/why-cards-are-the-future-of-the-web/

Mobile Design and Development: Practical concepts and techniques for creating mobile sites and web apps (Animal Guide) Aug 31, 2009

$9.71 - $15.39 ✓Prime
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Special Mention

This is a more visual layout based on two meaningful axes.
http://www.productchart.com/smartphones/

SCREEN SIZE

PRICE

Good Resources for Data Layouts

- Results view layout

  - https://uxmag.com/articles/designing-search-results-pages

- More

  - http://www.getelastic.com/grid-vs-list/

  - http://www.digitalsurgeons.com/thoughts/creative/list-vs-grid-view-how-do-you-choose/

CSS Flex for Layout

- Use CSS flexbox for data items layout
  - The Flexbox Layout is a new layout module in CSS3 made to improve the items align, directions and order in the container.
  - It is an one-dimension flow layout
  - https://developer.mozilla.org/en-US/docs/Web/CSS/CSS_Flexible_Box_Layout/Basic_Concepts_of_Flexbox

- Use it for layout instead of HTML table or floating "div"

- Quick impression and playground
  - https://demos.scotch.io/visual-guide-to-css3-flexbox-flexbox-playground/demos/

Flexbox Basic Example

1. Define the display style for the container div

```
<style>
#box
{

    display: flex;
    flex-wrap: wrap;
    width: 800px;

}
.boxitem
{

    width: 98%;
    margin: 5px;
    height:80px;

}
</style>
```

2. Use width for each item to control how many items per row.

```
<div id="box">
    <div class="boxitem">data</div>
    <div class="boxitem">data</div>
    <div class="boxitem">data</div>
    <div class="boxitem">data</div>
    <div class="boxitem">data</div>
    <div class="boxitem">data</div>
    <div class="boxitem">data</div>
    <div class="boxitem">data</div>
</div>
```

Flow List

data

data

data

13
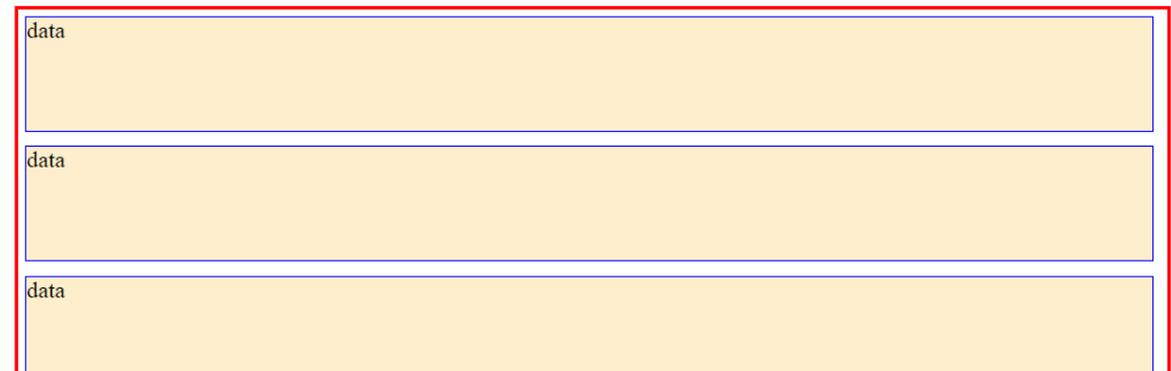
Flexbox Basic Example

This is from the example "flexbox-items-1.html"

```
<style>
#box
{

    display: flex;
    flex-wrap: wrap;
    width: 800px;

}
.boxitem
{

    width: 23%;
    margin: 5px;
    height:80px;

}
</style>
```

```
<div id="box">
    <div class="boxitem">data</div>
    <div class="boxitem">data</div>
    <div class="boxitem">data</div>
    <div class="boxitem">data</div>
    <div class="boxitem">data</div>
    <div class="boxitem">data</div>
    <div class="boxitem">data</div>
    <div class="boxitem">data</div>
</div>
```

Change the item width and the layout is changed to grid

Grid View

data	data	data	data
data	data	data	data
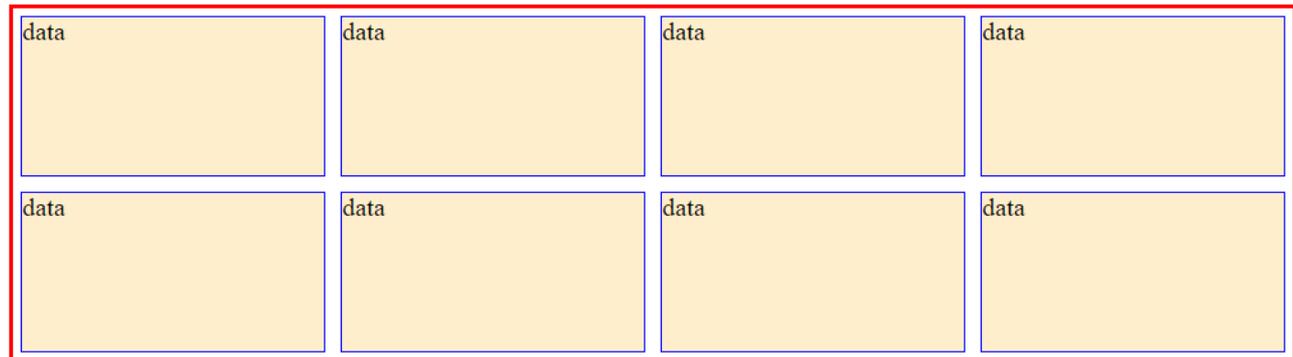
What Can CSS Flex Do

- Column based layout, instead of row based

- Easy dynamic layout switching

- Special items

Coding Examples List

- Live demo of all examples at http://it4203.azurewebsites.net/demo/data-layout

- **Examples can be downloaded on the content page. Please put all files to your server and see its effects. These AJAX examples need sever side support.**

Files	Example
flexbox-items-1.html flexbox-items-2.html flexbox-items-3.html flexbox-items-4.html	Use of CSS flexbox to create various layouts: 1. a basic flow list layout 2. a basic grid layout 3. a grid layout with a special first item 4. a vertical flow direction grid layout
flexbox-layout-switch.html	Use jQuery to switch between layouts.
book-flexbox-card.html	Use CSS flexbox for card layout (information about a single book).
book-flexbox-grid.html	Use CSS flexbox with the JSON data from the ITebooks API
template-1-multi.html	Use Mustache.js template to format the JSON data from a Web API (multiple items in an array)
template-2-single.html	Use Mustache.js template to format the JSON data from a Web API (single item)

Flex Box for Card Design

- Flexbox can also be used for the design of cards
  - See examples provided
  - https://www.quackit.com/css/flexbox/examples/flexbox_cards.cfm

- An alternative technique is to use CSS grid (not covered here)
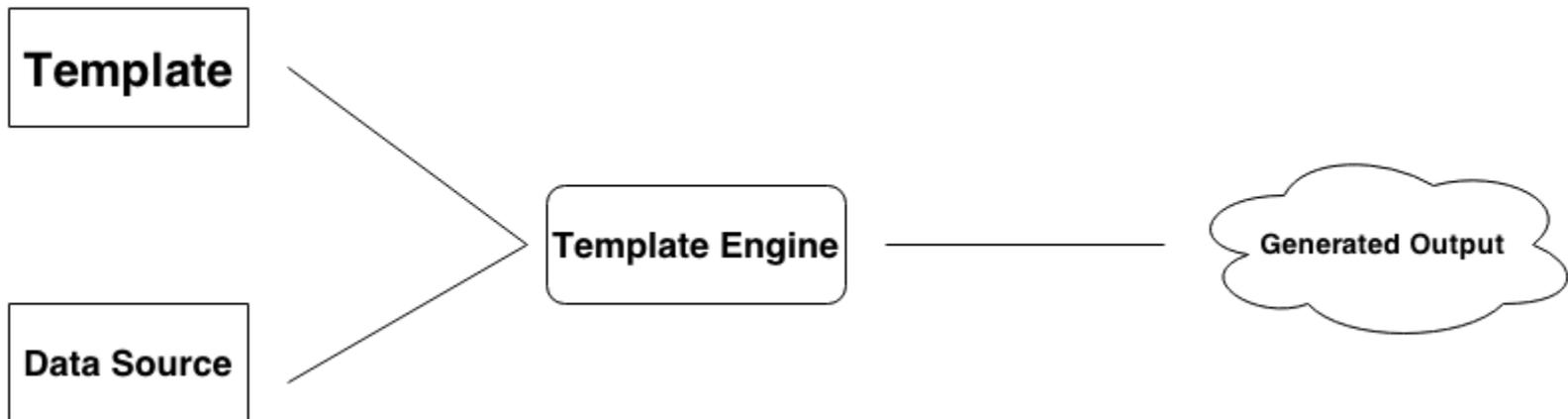
Good CSS Flex Resources

- CSS Flex Tutorials
  - https://www.quackit.com/css/flexbox/
  - https://developer.mozilla.org/en-US/docs/Web/CSS/CSS_Flexible_Box_Layout
  - https://css-tricks.com/snippets/css/a-guide-to-flexbox/
  - https://scotch.io/tutorials/a-visual-guide-to-css3-flexbox-properties
  - http://callmenick.com/post/flexbox-examples
  - http://www.sketchingwithcss.com/samplechapter/cheatsheet.html
  - https://gedd.ski/post/the-difference-between-width-and-flex-basis/

- Flexbox playground
  - http://demo.agektmr.com/flexbox/
  - https://scotch.io/demos/visual-guide-to-css3-flexbox-flexbox-playground

- More on CSS layout and box model
  - http://learnlayout.com/toc.html
  - https://www.youtube.com/watch?v=rIO5326FgPE&list=PLZlA0Gpn_vH85jM1TWO6TdCtSr6ruglWn&index=8

- CSS Grid (an alternative to Flexbox)
  - https://learncssgrid.com/
  - https://css-tricks.com/snippets/css/complete-guide-grid/
  - https://developer.mozilla.org/en-US/docs/Web/CSS/CSS_Grid_Layout
  - https://gridbyexample.com/
  - https://rachelandrew.co.uk/archives/2016/03/30/should-i-use-grid-or-flexbox/
  - https://webdesign.tutsplus.com/articles/flexbox-vs-css-grid-which-should-you-use--cms-30184

- UI Widgets and libraries
  - http://bootcards.org
  - http://www.jqwidgets.com

Template

- Formatting/styling JSON manually with string concatenation takes time and is error prone.

- Templates are used to "bind" a data source to a predefined template, which is cleaner.

Types of Templates

- Server side vs. client side templates
  - https://engineering.linkedin.com/frontend/client-side-templating-throwdown-mustache-handlebars-dustjs-and-more

- Embedded JavaScript Templates
  - These templating options allow you to embed regular JavaScript code directly within the template

- Logic-less Templates
  - This group of templates follows the philosophy that there should be little to no logic in your templates. They do not allow arbitrary JavaScript code in the template. Instead, you must use the small set of constructs offered by the templating language itself, which, depending on the language, may include basic loops, conditionals, and partials.

Mustache.js

- https://mustache.github.io

- A popular and simple template system

- A "logic-less" system because it lacks any explicit control flow statements

- It is named "Mustache" because of heavy use of curly braces ,{ }, that resemble a sideways moustache.

Mustache Tag Types

- {{   }}
  - Variable (or name) in JSON

- {{# }} … {{/ }}
  - Defines a section, depending on its existence, it can be used as an "if" , or a loop.

- Tutorial
  - http://www.sitepoint.com/creating-html-templates-with-mustachejs/

- Reference
  - https://mustache.github.io/mustache.5.html

Simple Mustache Example

- https://mustache.github.io/#demo

- The following code is from template-1-multi.html
  - API http://it-ebooks-api.info/v1/search/mobile

Use script tag to define a template; use the id attribute to name the template

```
<script id="booktemplate" type="text/template">
    {{#Books}}
    <div class='book'>
            <h2>{{Title}}</h2>
            <img src='{{Image}}' width='100' />
            <div>{{Description}}</div>
    </div>
    {{/Books}}
</script>
```

Use a pair of "#" and "/" to indicate processing repeatedly

Use {{ }} to wrap a field name in JSON

Good Template Resources

- https://en.wikipedia.org/wiki/JavaScript_templating

- Mustache
  - Quick intro to Mustache: https://www.youtube.com/watch?v=xIJuDcA6YBo
  - http://www.sitepoint.com/creating-html-templates-with-mustachejs/
  - Complete reference: https://mustache.github.io/mustache.5.html
  - http://coenraets.org/blog/2011/12/tutorial-html-templates-with-mustache-js/

- More templating
  - http://code.tutsplus.com/tutorials/best-practices-when-working-with-javascript-templates--net-28364
  - https://engineering.linkedin.com/frontend/client-side-templating-throwdown-mustache-handlebars-dustjs-and-more
  - https://developer.mozilla.org/en-US/docs/JavaScript_templates

- More libraries
  - http://json2html.com
  - http://handlebarsjs.com
  - http://jade-lang.com
  - http://beebole.com/pure/
  - http://jqueryhouse.com/top-5-best-javascript-template-engines/
  - https://colorlib.com/wp/top-templating-engines-for-javascript/