



Web Development Module Overview

12 Topics – one topic per week

Each Topic
builds on
concepts, tools
and techniques
from previous
weeks.



1: Introducing HTML



web · client/server · browser ·
html · documents · elements ·
attributes · links · images ·
nesting · block · inline

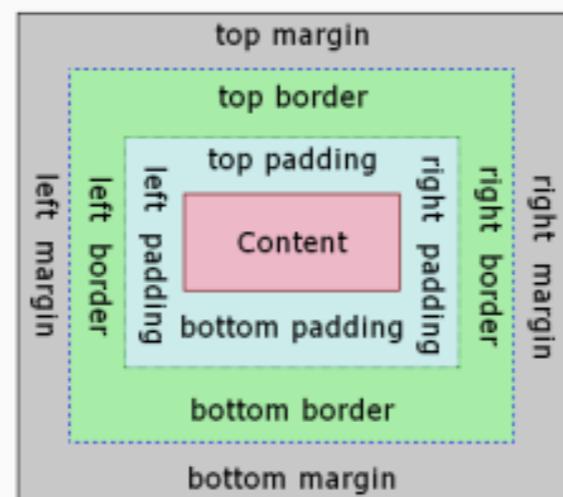
2: Introducing CSS



markup · style · function ·
stylesheet · rules · selectors ·
declarations · properties ·
values · classes · ids ·
inheritance

Core HTML + CSS

3: The Box Model



content · padding · border ·
margin · style · width · colour ·
dom · layout · float · left · right

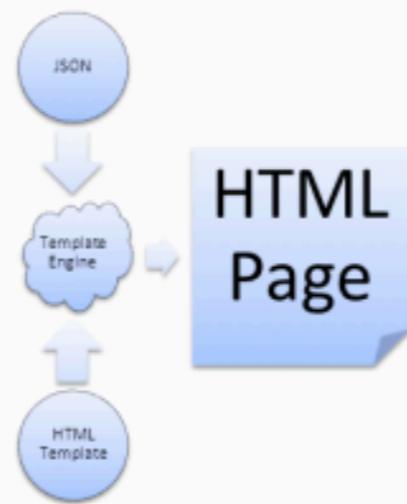
4: Navigation



html versions · header · main ·
nav · primary · secondary ·
footer · semantic elements ·
html style guide

Laying out pages with CSS Structuring a Navigation Metaphor

5: HTML Templates



servers · hosting · deployment
· dns · local server · dry ·
template engine · ejs · partials
· layouts

6: CSS Frameworks



Programming

Learn a broad range of programming and problem solving skills, including exciting new platforms, software tools and languages. Use these skills to build apps for mobile, cloud and device based IoT applications. Evolve a portfolio of fascinating applications.



Data Science

At the heart of many IoT applications is data: measurements, events alarms and other information that must be relayed, stored and ultimately turned into knowledge. Learn the fundamentals of modern approaches to data in this strand.



Networks

This strand will explore modern networks and cloud technology. Be able to configure, network and manage all categories of computer systems from simple controllers to single board board computers, mobiles and full workstations.



Project

Building exciting IoT projects in every semester of the programme. Your projects will combine skills acquired from the other strands and enable you to build a comprehensive and compelling portfolio of IoT applications and services.

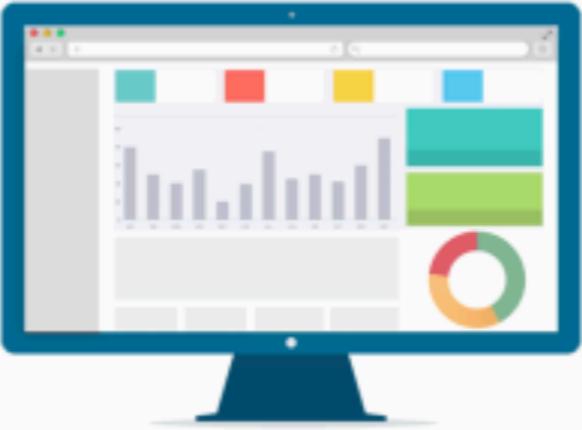


Modularising
a web site

Professional
Styling with
CSS Libraries

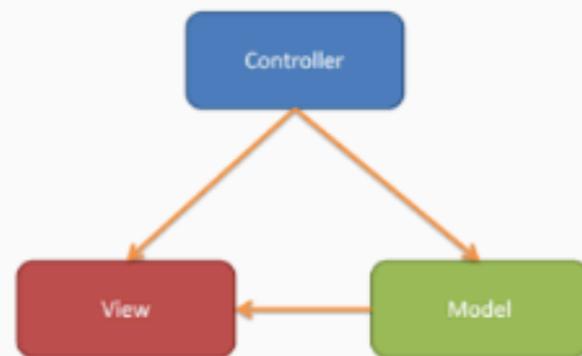
From Web Sites to Web Applications

7: Applications



sites · apps · frameworks ·
command line · ide · java ·
request · response · front-end
· back-end

8: Model View Controller



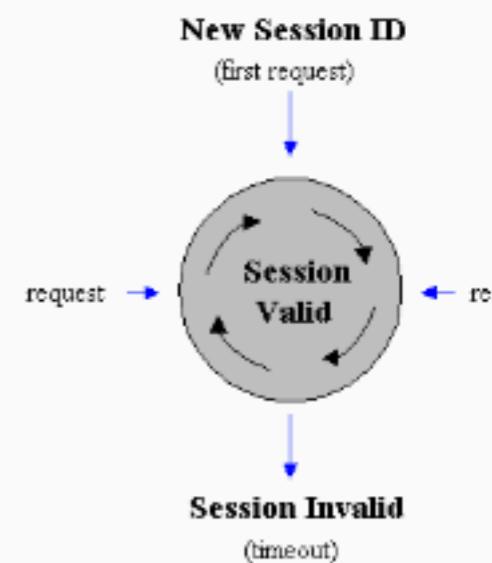
model · view · controller ·
config · template · layout ·
database · table · entity ·
onetomany

9: Forms



routes · get · post · delete ·
template loops · submit ·
buttons · 404

10: Sessions



stateless · stateful · tracking ·
cookies · signup · login ·
logout · session object ·
clearing

Fundamentals of Web Application Development

11: Git, Github & Bitbucket



repository · local · remote ·
push · pull · stage · commit ·
sourcetree · tag · history

12: Deployment



heroku · cli · config · database
· dashboard · logs · startup ·
management · shutdown

Moving an Application to the Cloud

1: Introducing HTML



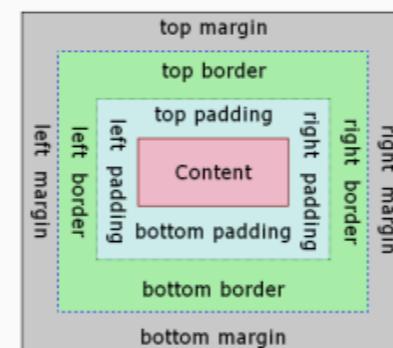
web · client/server · browser ·
html · documents · elements ·
attributes · links · images ·
nesting · block · inline

2: Introducing CSS



markup · style · function-
stylesheet · rules · selectors ·
declarations · properties ·
values · classes · ids ·
inheritance

3: The Box Model



content · padding · border ·
margin · style · width · colour ·
dom · layout · float · left · right

4: Navigation



html versions · header · main ·
nav · primary · secondary ·
footer · semantic elements ·
html style guide

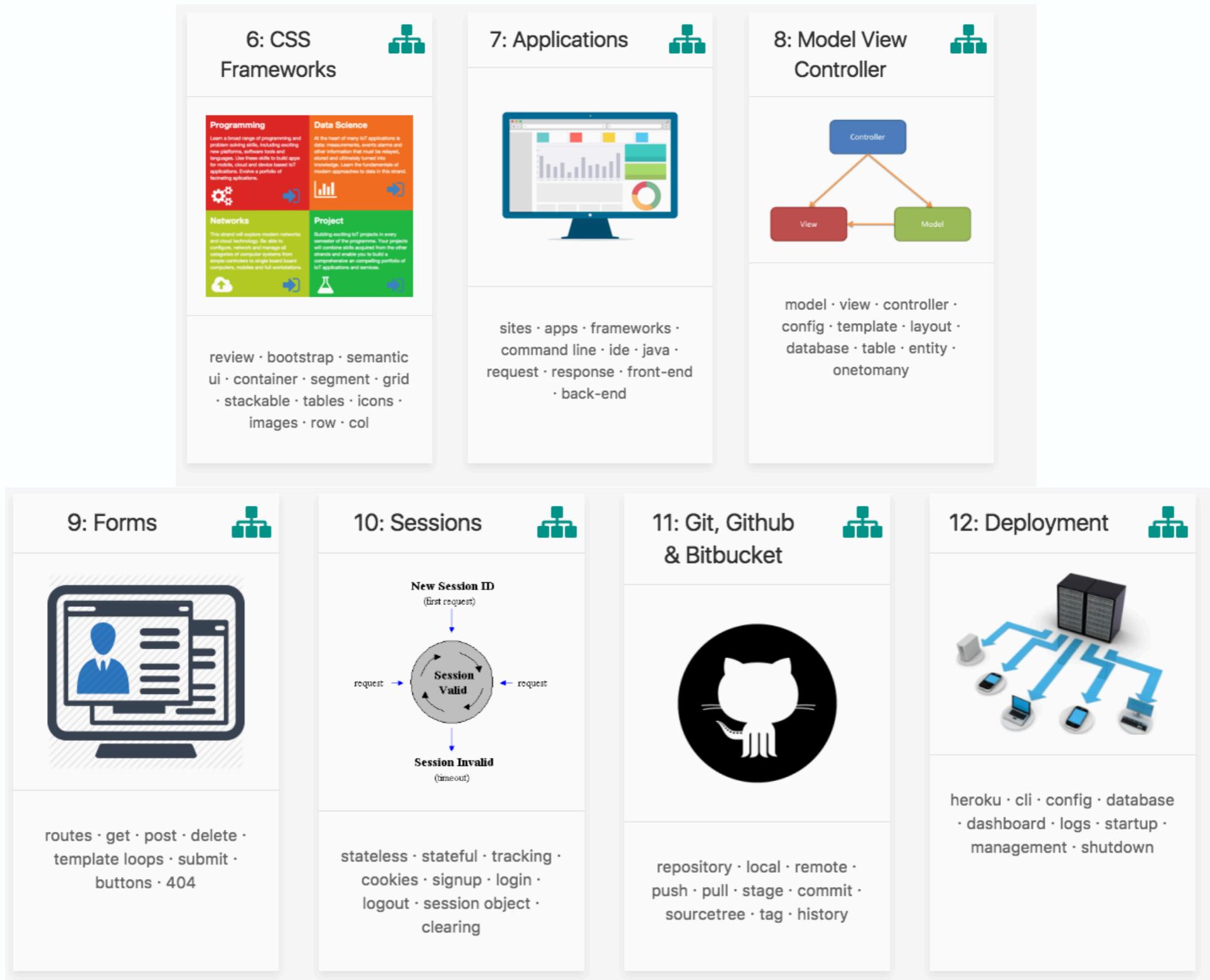
5: HTML Templates



servers · hosting · deployment
· dns · local server · dry ·
template engine · ejs · partials
· layouts

Assignment 1 based on skills acquired in topics 1-5

Allocated 40% of overall module grade



Assignment 2 based on skills acquired in topics 6-12

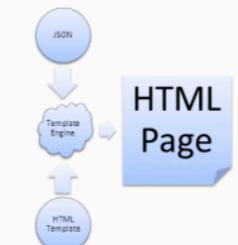
Allocated 60% of overall module grade

1: Introducing HTML



web · client/server · browser · html · documents · elements · attributes · links · images · nesting · block · inline

5: HTML Templates



servers · hosting · deployment
· dns · local server · dry ·
template engine · ejs · partials
· layouts

9: Forms



routes · get · post · delete ·
template loops · submit ·
buttons · 404

2: Introducing CSS



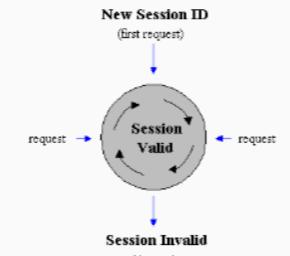
markup · style · function-stylesheet · rules · selectors · declarations · properties · values · classes · ids · inheritance

6: CSS Frameworks



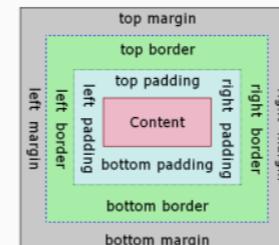
review · bootstrap · semantic ui · container · segment · grid · stackable · tables · icons · images · row · col

10: Sessions



stateless · stateful · tracking · cookies · signup · login · logout · session object · clearing

3: The Box Model



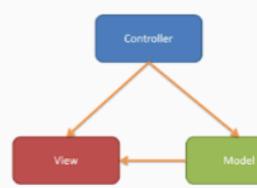
content · padding · border · margin · style · width · colour · dom · layout · float · left · right

4: Navigation



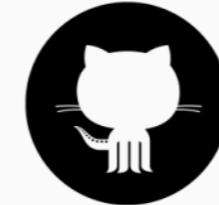
html versions · header · main · nav · primary · secondary · footer · semantic elements · html style guide

8: Model View Controller



model · view · controller · config · template · layout · database · table · entity · onetomany

11: Git, Github & Bitbucket



repository · local · remote · push · pull · stage · commit · sourcetree · tag · history

12: Deployment



heroku · cli · config · database · dashboard · logs · startup · management · shutdown

The Nature of the Web



code · html · http · standards ·
evolution · role of client · role
of servers · learning resources

HTML Basics



elements · attributes · paths ·
absolute · relative · nesting ·
block · inline · labs

Lab-1.1: Editing HTML

```
index.html
1 <html>
2   <head>
3     <title>Starbucks Coffee</title>
4   </head>
5   <body>
6     <h1>Starbucks Coffee Beverages</h1>
7     <ul>
8       <li>House Blend, $1.49</li>
9       <li>Smooth, wild blend of coffees from Mexico, Bolivia and Guatemala.</li>
10      <li>Mocha Latte, $2.75</li>
11      <li>Espresso, steamed milk and chocolate syrup.</li>
12      <li>Cappuccino, $2.89</li>
13      <li>Latte or espresso, steamed milk and foam.</li>
14      <li>Chai Tea, $1.85</li>
15      <li>Spicy drink made with black tea, spices, milk and honey.</li>
16   </body>
17 </html>
```

editor · files · text · tags ·
browser · reference

Lab-1.2: HTML Structure



Welcome to the App Bundle Store

This store brings you great app bundles week after week. We select the best power user apps from a broad range of super high-quality apps from the best publishers, at great prices.
Whether you are interested in gaming or graphics design, software development or media production - we have the one for the other, delivering you an exciting take-on-a-scene.

Favourites

- Hypo by Tantek
- Monodroid by Iowa
- Sublime Text by SublimeLinter
- Desktop Utility by Sweet Productions

folders · head · title · link ·
image · references

Topic 01

Introducing HTML

HTML Elements



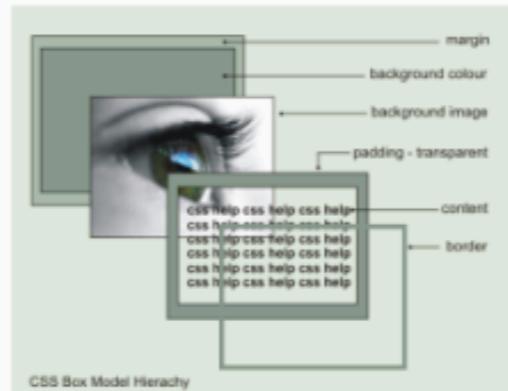
structural elements · head
elements · text elements · list
elements · image elements ·
shared attributes

CSS Basics



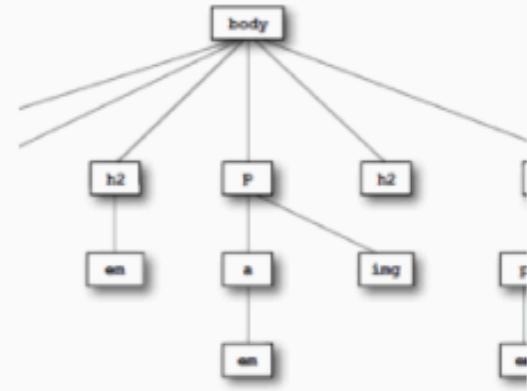
markup · presentation · style
· rules · selectors ·
declarations · properties ·
values

CSS Rules



combining rules · combining
selectors · class · id · div

CSS Cascade



rules · class · elements ·
explicit · inheritance · default
· most specific · order

Lab-2 CSS Intro

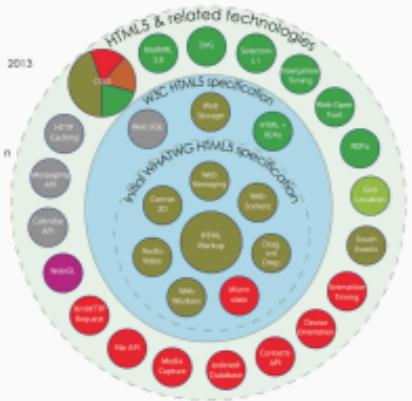
```
<!DOCTYPE HTML>
<html>
  <head>
    <title>APP Scores</title>
    <link type="text/css" rel="stylesheet" href="style.css" media="screen" />
  </head>
  <body>
    <h1>Scores: Apps, Movies, Music, Books</h1>
    <ul>
      <li><a href="apps.html">Apps</a></li>
      <li><a href="movies.html">Movies</a></li>
      <li><a href="music.html">Music</a></li>
    </ul>
    <div class="main_panel">
      <div>New Games!</div>
      <ul>
        <li>Clear All</li>
        <li>Google Now</li>
        <li>Squircle</li>
      </ul>
    </div>
  </body>
</html>
```

inheritance · classes · fonts ·
colours · indentation · best
practices

Topic 02

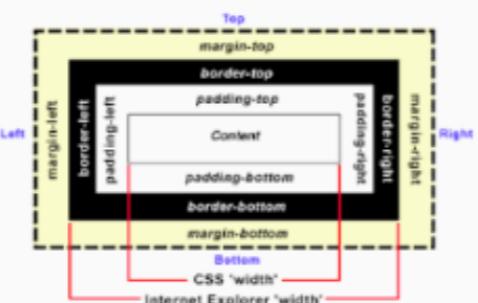
Introducing CSS

Web Standards Evolution



standards · w3c · whatwg ·
sgml · xhtml · html5 ·

Box Model Fundamentals



content · padding · border ·
margin · variations · fonts ·
dimensions

Box Model Example

Our guarantee: at the lounge, we're committed to providing with an exceptional experience every time you visit. Whether stopping by to check in on email over an elixir, or are here ordinary dinner, you'll find our knowledgeable service staff every detail. If you're not fully satisfied, have a Blueberry B

ut that's not all; at
ance and drumble
ne of our comfy w
ne main lounge rig
jungle area to relax
nnected with our

.guarantee
`border-color: black;
border-width: 1px;
border-style: solid;`

border-width · border-style ·
padding · width · margin-left ·
text-align · float

Multicolumn Layout



box structure · containing
block · margins · floating ·
clearing · multicolumn layout

Lab-3a Layout

Welcome to the App Bundle Store. This store brings you great app bundles week after week. We select the best power user apps from a broad range of sources and combine them into great deals. These are the highest quality apps from the best publishers, at great prices.

Whether you are interested in gaming, or graphics design, software development or media production - we have the bundle for you. Each app bundle is designed to accomplish the tasks, delivering you an exciting take on a genre.

Our promise is that the items, will be committed to providing you, with an exceptional quality and reliability. Every application is checked in detail, for stability, usability and interoperability. If you are unhappy with any individual app in a bundle we will refund you the full amount for the complete adds, no questions asked.

We sell over the bundles on a weekly basis, so be sure to check back regularly for bundles that suits your tastes. If you don't see application bundles that suit your interests - please let us know! We are always interested in combining new and interesting bundles and will strive to figure out your needs and match them to current or upcoming offerings.

Now that you've got some idea of what we do, why not call into our store? We have created some [contact details](#) so you can reach us in record time. Come and join us anytime.

What's Apps we Like

fonts · content · images ·
classes · folding editor ·
sidebar · float

Lab-3b Multicolumn

Lorem ipsum dolor sit

<ul style="list-style-type: none">MaurisCrasPriusIntegerCarolinaIntegerSuspensionQuisque	<p>Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed feugiat nisi at sapien. Phasellus varius incident ligula. Praesent nisi. Duis sollicitudin. Donec dignissim, est veluctor blandit, ante est looreet neque, non pellentesque massa turpis eu purus.</p> <p>Suspendisse mollis leo nec diam. Vestibulum pulvinar tellus sit amet nulla fringilla semper. Aenean aliquam, urna et accumsan sollicitudin, tellus pede loboris velit, nec placerat dolor pede nec nibh. Donec fringilla. Duis adipiscing diam at enim. Vestibulum nibh.</p>
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header · maincontent ·
navigation · footer · primary ·
secondary

Topic 03

Box Model

HTML Style Guide



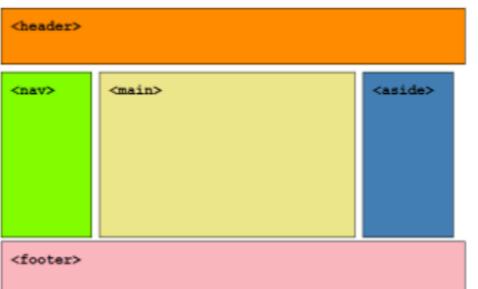
indentation · encoding ·
doctype · validity · semantics ·
entities · type attributes ·
quotations

Navigation



nav · tab · current · padding ·
border · menu · li · ul

Semantic HTML



header · main · nav · aside ·
article · footer · section · figure

CSS Style Guide



validity · names · name style ·
selectors · shorthand ·
delimiters · order · stops ·
quotations

Lab-4a Navigation

Lorum ipsum dolor sit

Home Case Print Integer Caribiner Integer Suspendisse Quisque

Lorum ipsum dolor si amet, consecetur adipiscing ellis. Sed fringilla nisi at sapien. Phasellus varius tincidunt ligula. Praesent nisi. Duis sollicitudin. Donec dignissim, est vel auctor blandit, ante est laoreet neque, non pellentesque mauris tempor et purus.

Suspendisse mollis leo et diam. Vestibulum pulvinar tellus sit amet nulla fringilla scelerisque. Aenean aliquam, urna et accumsan sollicitudin, tellus pede lobortis velit, nec pharetra dolor pellentesque nibh. Donec magna. Donec adipiscing diam et orci. Vestibulum nibh.

Nulla facilisi. Aliquam dapibus leo eget leo. Etiam vitae turpis sit amet massa posuere cursus. Sed vitae justo quis tortor facilisis ultricies. Integer id erat. Donec at foliis et erat interdum. Quisque euismod. Donec ultricies.

Tellus semper enim, in elementum quam sapien ex lectus. In dolor utra, ullamcorper vol, tempus sit amet, semper ut, felis. Presente sapien.

Proin quis orci eu est molestie varius. Praesent condimentum erat in lectus. Ut ipsum. In hac habitasse platea dictumst.

nav · tab · current · padding ·
border · menu · li · ul

Lab-4b Case Study



header · main · nav · aside ·
article · footer · section · figure

Topic 04

Navigation, Semantics & Style Guides

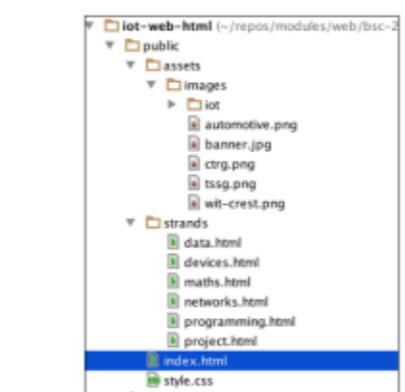
Deployment

clients · servers · hosting · domains · dns · paths · http · response codes

Harp & Surge

command prompt · node · harp · surge · server · compile

Case Study



structure · layout · semantic elements · fonts · web safe fonts · images · picture element

Templates

EJS · dry · wet · engine · partials · includes · layouts · paths · compile

Lab-5a Harp & Surge



Install software tools to serve a web site locally and also to deploy the web site to a public web server.

Lab-5b Templating

Rebuild the IoT web site from the last lab using templating. This version of the site will aim to significantly reduce the content the author has to manage by reusing 'templates' containing common sections.

Lab-5c Templating & Nav



Rework the tabbed navigation site from lab 04 to use EJS template

Topic 05

HTML Templates & Deployment

Lab Review



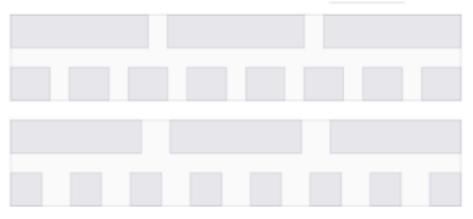
Semantic-UI I: Container & Segment

	Mobile	Tablet
Width	100%	723px
Gutter Size	1em	Fluid
Responsive Visibility	mobile only	tablet only
Device Width	below 768px	768px - 991px

project structure · semantic ui archive · container · segment · raised · stacked

lab-1 · lab-2 · lab-3 · lab-4 · lab-5 · lab-6

Semantic-UI II: Grids & Images



row · column · aligned · center · top · image · small · medium · large

Semantic-UI III: Tables

Employee	Correct Guesses
Lena Human Resources	22
Matthew Fabric Design	15
Lindsay Entertainment	12
Mark Executive	11

table · celled · padded · single line · striped · inverted

Semantic Part IV: Layout



Programming
Learn a broad range of programming and problem solving skills, including existing new platforms, software tools and languages. Use these skills to build apps for mobile, cloud and device based IoT applications. Evolve a portfolio of fascinating applications.

Data Science
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Networks
This strand will explore modern networks and cloud technology. Be able to configure, network and manage all categories of computer systems from simple controllers to single board based computers, modules and full workstations.

Project
Building exciting IoT projects in every semester of the programme. Your projects will combine skills acquired from the other strands and enable you to build a comprehensive and compelling portfolio of IoT applications and services.

Lab-6a Semantic UI 1

Department of Computing & Mathematics
BSc (Hons) the Internet of Things

BACHELOR OF SCIENCE IN THE INTERNET OF THINGS
APPLIED COMPUTING IN THE INTERNET OF THINGS

Program your World
An exciting new level 8 module for 2019-2020! Learn how to program IoT devices and learn how to code cool dashboards, web pages, mobile and desktop applications, and much more!

Programming
Learn a broad range of programming and problem solving skills, including existing new platforms, software tools and languages. Use these skills to build apps for mobile, cloud and device based IoT applications. Evolve a portfolio of fascinating applications.

Data Science
At the heart of many IoT applications is data: measurements, events alarms and other information that must be relayed, stored and ultimately turned into knowledge. Learn the fundamentals of modern approaches to data in this strand.

Devices
The 'Things' we connect to are often physical devices. These can range from simple temperature sensors to sophisticated control systems like traffic lights or cameras. Connecting to and interacting with the physical world is the subject of this strand.

grid · stackable · padded · aligned · color · icons · cdns

Rebuild the iot web site using semantic-ui

Lab-6b Semantic UI 2

Department of Computing & Mathematics
BSc (Hons) the Internet of Things

APPLIED COMPUTING IN THE INTERNET OF THINGS

Program your World

Programming
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Devices
The 'Things' we connect to are often physical devices. These can range from simple temperature sensors to sophisticated control systems like traffic lights or cameras. Connecting to and interacting with the physical world is the subject of this strand.

Mathematics
Mathematics is the language of science and engineering. It is used to describe the world around us and to predict future events. It is also used in many other fields such as economics, finance, and medicine.

TSSG
cfrg
Information Systems Group

Continue to enhance the IoT web site with additional Semantic-UI styles & Components

Topic 06
CSS Frameworks

Web Sites/Applications



theme · content · navigation ·
structure · templates · style ·
interaction · business logic ·
context · static · dynamic

Starting to Play

```
~ [DESKTOP-1I1K6D1] ~  
~ play! 1.5.0, http://www.playframework.org  
~ Usage: play cmd [app_path] [--options]  
~ with, new Create a new application  
~ run Run the application in the  
~ help Show play help
```

download · expand · path ·
verify · run · idealize · skeleton
app

Web App Introduction



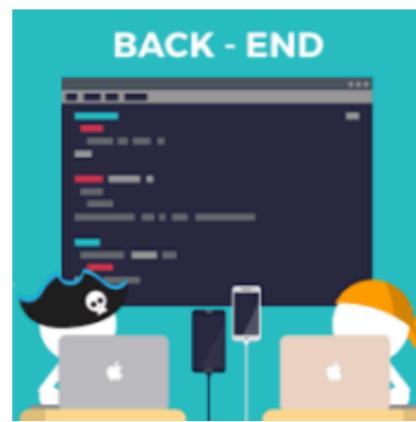
structure · front-end · backend
· router · model · view ·
controller

Front-end



layout · partials · views · tags ·
about · dashboard · main · start

Back-end



request · router · controller ·
view · response

Lab-07a Play Setup

```
~ [DESKTOP-1I1K6D1] ~  
~ play! 1.5.0, http://www.playframework.org  
~ The new application will be created in c:\  
~ What is the application name? [playdemo]
```

Install and test Git + the Play
Framework

Lab-07b Playlist 1

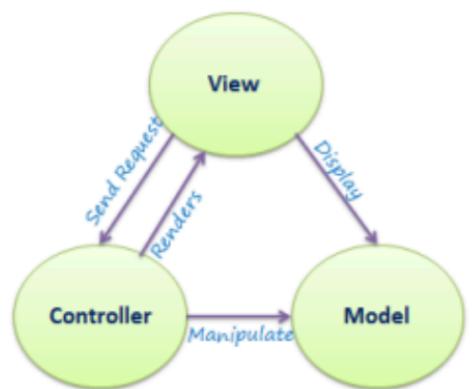


Import, rename and run a new
starter project. Extend the
project to include a Model.

Topic 07

Applications

Model View Controller



request · router · controller ·
view · response

Views



Beethoven Sonatas

Song	Artist
Piano Sonata No. 3	Beethoven
Piano Sonata No. 7	Beethoven
Piano Sonata No. 10	Beethoven

Beethoven Concertos

Song	Artist
Piano Concerto No. 1	Beethoven
Piano Concerto No. 12	Beethoven
Piano Concerto No. 23	Beethoven

```
{#extends /} · {#set /} · {#list /} ·  
{#list /} · {#menu /} ·  
{#listsongs /}
```

Models



SELECT * FROM SONG;

ID	ARTIST	DURATION	TITLE
1	Beethoven	0	Piano Sonata No. 3
2	Beethoven	0	Piano Sonata No. 7
3	Beethoven	0	Piano Sonata No. 10
4	Beethoven	0	Piano Concerto No. 27
5	Beethoven	0	Piano Concertos No. 17
6	Beethoven	0	Piano Concerto No. 10

(6 rows, 6 ms)

Edit

table · row · mem · yaml · Song
· Playlist · ArrayList ·
OneToMany ·
OnApplicationStart

Lab-08a Playlist-2



Move the playlist model into the database. Prime the database from a YAML file.

Lab-08b Playlist-3



Move the playlists into their own view. Introduce routes for opening the playlist and also deleting individual songs.

Topic 08

Models & Views