WEB422 - Web Programming for Apps and Services

Week 1 – Lecture Recap:
Course Introduction

Agenda

- Course Introduction
- Developer Tools
- Web Services Introduction
- Creating and Testing a Web Service

Course Introduction

- Welcome to WEB422!
- My.Seneca / Blackboard
  - Weekly Schedule
  - Learning Content ★
  - Assignments/tests
  - Online office
    - student help hours
  - Discussions
  - Sending email

Course Introduction

- My.Seneca / Blackboard (cont'd)
  - Grade work
  - Promotion policy
  - MyApps: VS Code
- Course website - https://webprogrammingforappsandservices.sdds.ca/
  - Weekly Lecture Notes
- Seneca GitHub server - https://github.senecacollege.ca/
  - Course website project: SDDS/WebProgrammingForAppsAndServices
  - Code examples: /static/examples/
  - Sign in with SAML – must connect to Seneca VPN

Week 1 Notes & Home page

- WEB222
  - HTML, CSS, JS, DOM – static website,
  - AJAX – simple front-end/client-side apps – dynamic
  - JS – vanilla JavaScript

- WEB322
  - node.js/express.js - dynamic <- server engine
    - node.js – 'J'RE: 1st time JS runs on server
  - server-side/back-end technologies:
    - web app and web service (API), like ASP.NET, JSP/Servlets
    - design pattern: MVC (M: data-service.js, V: handlebars, C: server.js)
  - security implementation

Week 1 Notes & Home page

- WEB422
  - Backs to front-end
    - HTML, CSS, JS, DOM, AJAX
    - using variety of libraries and frameworks: ?
  - Trend: web api + front-end apps. Why?
    - to serve more users, performance,
    - powerful pc, UX
  - Full-stack (front-end (browser, mobile) + back-end (api, db)) development/solution: MERN or MEAN
    - React/~~Angular~~ → Next.js (/React)
      - CSR, SSR, SSG, …
  - Difference between server-side app and front-end (client-side) app?

Developer tools

- Dev tools:
  - …
  - HTTP inspector:
    - Visual Studio Code Extension: Thunder Client
    - Postman
  - Data generator:
    - mockaroo.com

Course Web services (re)introduction

- What is a web service?
- What's the difference between a web app, and a web service?
- WEB Service and API
- Are web services important?
- How do I learn to create web services (API)?
  - http methods ←→ CRUD operations
  - corresponding routes/url pattern
  - http request: passing data? Header: content-type
  - http response: status code? res.status(…)

Creating Web Service (API) e.g. reqres.in

RESTful API, HTTP request/response

Route (pattern)	HTTP Method	Description (CRUD)	HTTP request		HTTP response		
			HTTP Body (data)	HTTP Header:	Status code	Data type	Data (return value)
/api/users	GET	Get all (users) - R	--	--	(200)	res.json (…)	array of (User) objects
/api/users	POST	Create/Add new (user)	JSON object (no id)	Content-Type: application/json (a MIME type)	201	res.json (…)	(created User) object with id
/api/users/:Id	GET	Get one (user) – R	--	--	(200)	res.json (…)	(User) object
/api/users/:id	PUT	Update existing (user)	JSON object	Content-Type: application/json	(200)	res.json (…)	(updated User) object
/api/users/:id	DELETE	Delete item (user)	--	--	204	res.json (…)	nothing

Terminology

- Web app, and web service
- Resource
- Representation
- Internet media type
  - Content-type in http protocol
  - MIME type vs file extension
- JSON
  - 2 structures:{}, []; 5 types; no Date type; property names must be quoted
- State
  - Data, Session
- REST and WEB API

In-class demo

- Creating web services
  - CRUD template with string responses
  - Using data of a string array - colors
  - Using an array of objects plus data service
- The Thunder Client 
  - VSC extension installation 
  - to test and interact with the web service

Code Example & Assignment 1

- Assignment 1
  - MongoDB Atlas Sample Data
  - Response with 404, 500
  - Get one with no existing id
    - For array data, e.g. in Week 1 example code, when the id (req.params.id) that causes array out-of-range, the response with 404 error:

```
if (itemId > colours.length) {
    res.status(404).send('Resource not found');
} else {
    res.json(colours[itemId]);
}
```

    - For db table, if the id (req.params.id) doesn't exist in the table, you may simply return/response with null value or an empty object {} (see https://reqres.in)
  - Using Promise

The End