COMP 4601A
Fall 2023 - Lab #1

Objectives

The goal for this lab is to start building an e-commerce themed web application that we will continue to build on over the first few weeks of the course. This will require the application of RESTful design principles and the use of Node.js/Express or a similar language/framework of your choosing.

Demonstrating/Submitting

There will be two ways to receive credit for completed labs, outlined below:
1. Attend an in-person lab or office hours and demonstrate your completed lab before the deadline. You will have to show that the goals of the lab have been completed and answer some questions about the lab and your code (see the lab reflection questions for some examples). Your grade will depend on the level of completion, as well as the quality of your design and answers. Only one partner is required for demonstration, though all partner's are encouraged to take part. **If you demonstrate your lab this way, you don't need to submit anything on Brightspace.**
2. Record a video demonstration that is <10 minutes long. Ensure that your discussion in the video makes it clear that you have understood the content that the lab covers and that you demonstrate all the required functionality. Submit a ZIP containing a copy of your code (don't include database files, etc.), your answers to the lab reflection questions, and a copy of your demonstration video (either link to a public URL in your README or include the video file directly) to Brightspace. **If you are working with a partner, only one of you should make a submission.**

Lab Description

We will start with building a basic RESTful application that will allow searching, viewing, and manipulating products that could be stored as part of an e-commerce website. The products.json file included on Brightspace contains a JSON string representing an array of products. Each product in this array has the following structure (you can add further attributes if you want):

```
{
   id: Number, //unique ID for each product
```

```
    name: String, //the name of the product
    price: Number, //price of the product
    dimensions: { x: Number, y: Number, z: Number}, //size dimensions of the product
    stock: Number //the number of units in stock
}
```

To complete this lab, you must implement a RESTful server along with a web-based client that is capable of interacting with the server to demonstrate its functionality. At minimum, the server must support:

1. A way to search for products. You must support the ability to search by name. You must also support the ability to search for all products or only products that are in stock. It should be possible to specify both a name search parameter and an all/in-stock search.
2. A way to create a new product by accepting a JSON string containing the name, price, x/y/z dimensions, and initial stock quantity of the product.
3. A way to retrieve and view a specific product (i.e., by ID), which must show all of that product's associated information. The server should support the client requesting either JSON or HTML representations.
4. A way to add a review for a specific product. For now, a review for a product can simply be a rating from 1-10.
5. A way to retrieve and view only the reviews for a specific product. The server should support the client requesting either JSON or HTML representations.

It is important to follow RESTful design principles in your design and implementation. Your server does not require data persistence; it is fine if it resets to its initial state when stopped. We will add a database in the following lab.

Lab Reflection Questions

1. Describe the RESTful design of your implementation
    a. What resources do you have and what is their structure?
    b. Which HTTP methods are you using for various operations and why?
    c. What is your URI naming scheme?
    d. What response codes are you sending and why?