Langara.
THE COLLEGE OF HIGHER LEARNING.

FULL STACK WEB DEVELOPMENT I(CPSC 2650)

Final Group Project

Due Date: April 9, 2024

Mourad Bouguerra
mbouguerra@langara.ca

- This final group project requires you to build a full-stack website using
  - Front-end languages (HTML5, CSS3, and JavaScript ES6)
  - Bootstrap front-end framework
  - Node.js back-end framework
  - MongoDB back-end database and HTTP (web) server

Part-I
Design Patterns

(60 marks)

1. Implement the following web **GUI design patterns** using Bootstrap classes: **(12 marks)**

(a) **Navigation Bar** (2 marks)

(b) **Grid Layout** (2 marks)

(c) **Responsive Design** (2 marks)

(d) **Card** (2 marks)

(e) **Slider** (2 marks)

(f) **Modal Window** (2 marks)

2. Implement the following **programming design patterns**: **(48 marks)**

(a) The **module** design patter (4 marks)

(b) The **singleton** design patter (4 marks)

(c) The **factory method** design pattern to generate the mapper objects of your data (10 marks)

(d) The **Model-View-Controller** (**MVC**) design pattern to develop your full-stack website using the (see figure 1 on page 4) (30 marks)

(i) Appropriate modules in models directory (10 marks)

(ii) Appropriate modules in views directory (10 marks)

(iii) Appropriate modules in controllers directory (10 marks)

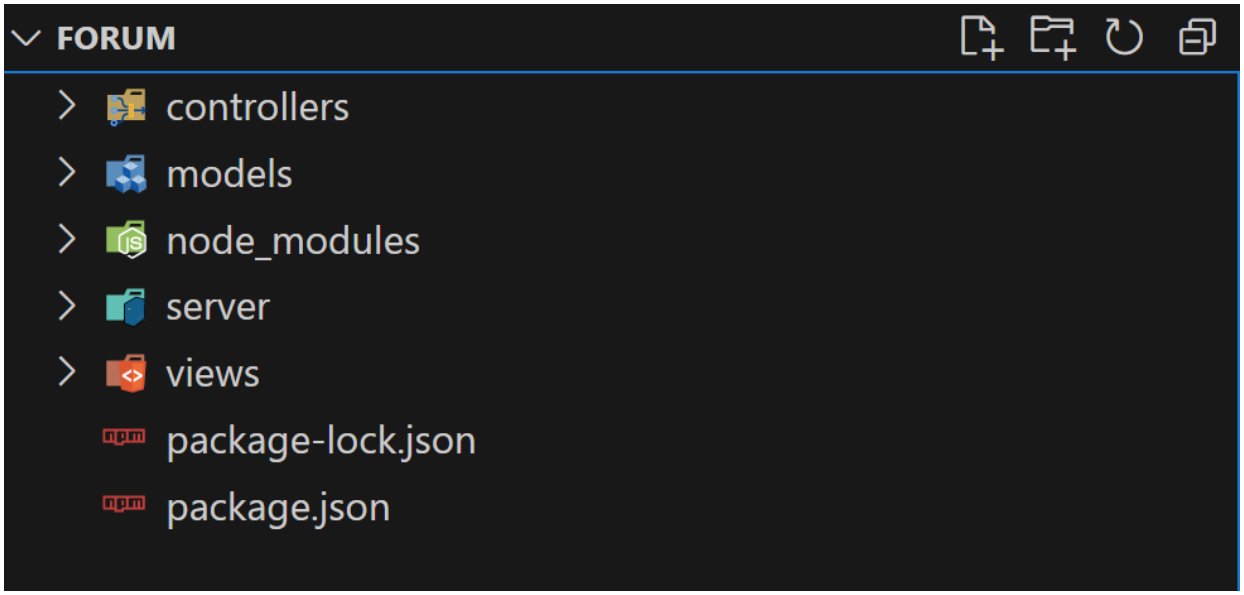

Figure 1: MVC Folder Structure

Part-II
Authentication, Authorization, and Accountability (AAA)

(40 marks)

1. Your full-stack website must provide authentication, authorization, and accountability (AAA)

(a) Authentication: To access your content, users must be authenticated using a username and password (15 marks)

(b) Authorization: Implement authorization by adding three roles: admin, member, and guest (15 marks)

(c) Accountability: generates a collection in MongoDB that stores key information for all requests/responses (see figure 2 on page 5) (10 marks)

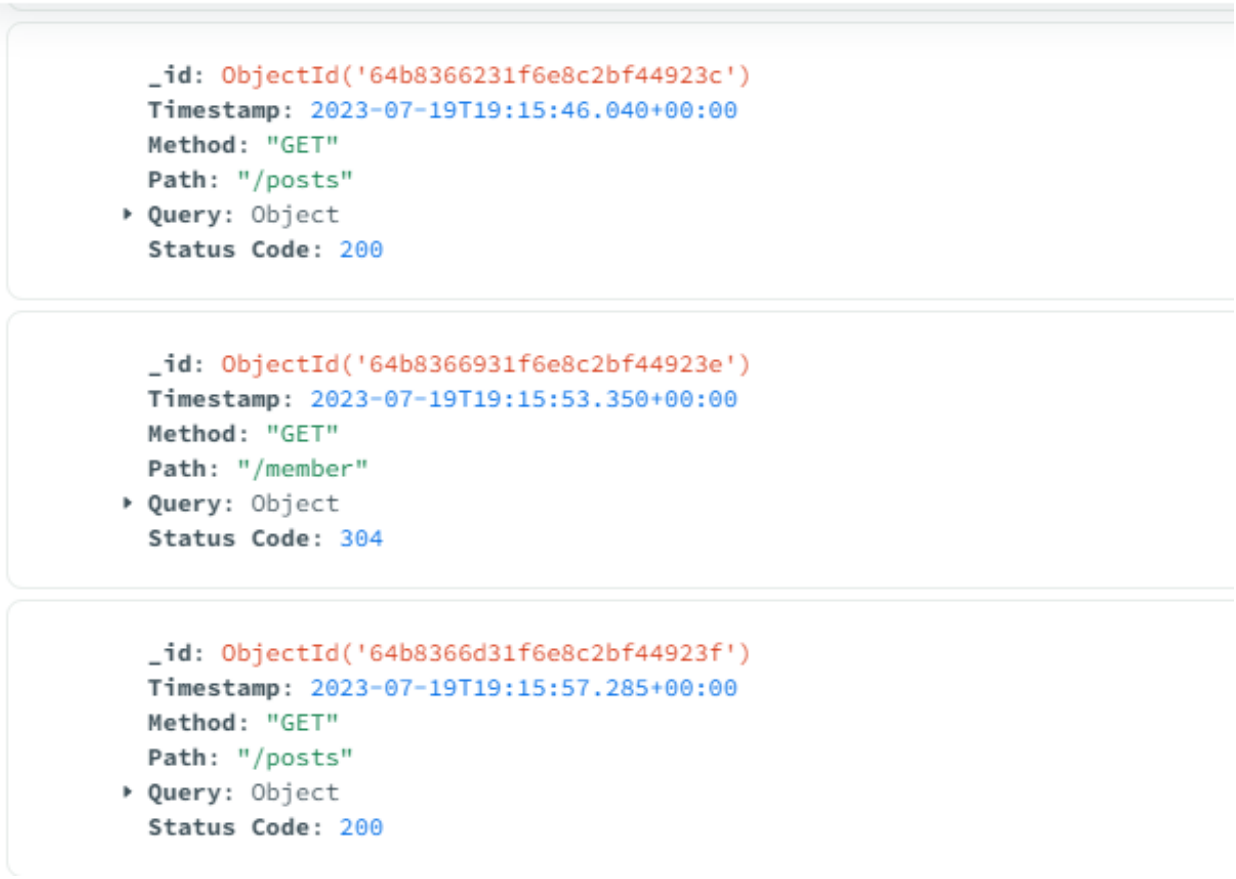

Figure 2: Sample MongoDB Log Collection

Part-III
Web APIs

(40 marks)

1. **Client-side RESTful APIs** to **Node.js** web server using

   (a) **HTTTP GET** method

   (b) **HTTTP POST** method

   (20 marks)

2. **Server-side RESTful APIs** to an external web service provider **(20 marks)**

Part-IV
MongoDB Backend Database

(40 marks)

1. Add appropriate utility module that includes the following **function expressions** to

(a) connect to both local and remote MongoDB server (10 marks)

(b) implement CRUD operations (30 marks)

Part-V
Git Version Control System (VCS)

(20 marks)

1. Use Git VCS with a remote repos[1]

(a) Each group member must contribute and commit her/his contributions (10 marks)

(b) Effective use of Git VCS (10 marks)

[1] Either you can use my remote server repos or use a different remote repos and provide me with access to it.

Marking Scheme

Task	Marks
Part- I	60
Part- II	40
Part- III	40
Part- IV	40
Part- V	20
Total	**200**

Submission

✎ Upload a zip file to Brighspace that includes your website files and directories.