Module 8 — Overview

8 OVERVIEW

Introduction

In this module, we deepen our understanding of the HTTP protocol. We will study HTTP methods, HTTP headers and HTTP status codes in more detail. We will then look at the stateless nature of the HTTP protocol, and study HTTP cookies and HTTP sessions that are mechanisms to overcome some of the issues caused by statelessness of HTTP. Finally, we will study REST APIs which is a widely used architectural style for implementing web services. We will look at concepts related to REST APIs and understand how we can implement REST APIs using Express.

Module Learning Outcomes

After successful completion of this module, you should be able to do the following (in addition to answering the questions listed below):

1. What is the typical use of some frequently used HTTP methods? (CLO 1)
   - What is GET used for?
   - What is POST used for?
   - What is PUT used for?
   - What is PATCH used for?
   - What is DELETE used for?
2. What are HTTP headers and what is their use? (CLO 1)
   - What is meant by MIME types and how are they relevant to HTTP requests and responses?
   - What is the use of the `Accept` header?
   - What is the use of the `Content-Type` header in HTTP requests?
   - What is the use of the `Content-Type` header in HTTP responses?
   - When is the MIME type `application/x-www-form-urlencoded` used?
3. What is the use of HTTP response status codes?
   - What is the general use of status codes 100-199?
   - What is the general use of status codes 200-299?
   - What are status codes 200, 201 and 204 typically used for?
   - What is the general use of status codes 300-399?

- What is the general use of status codes 400-499?
- What are status codes 400, 401, 403 and 404 typically used for?
- What is the general use of status codes 500-599?
- What is the status code 500 typically used for?

4. Understand why HTTP protocol is stateless and the uses of HTTP Cookies and HTTP Sessions. (CLO 1, CLO 2)
- What does it mean when we say that HTTP protocol is stateless?
- What are some potential problems for web apps due to the statelessness of HTTP protocol?
- What are HTTP cookies and how can they help overcome the stateless nature of the HTTP protocol?
- What is the `Cookie` header used for?
- What is the use of the `cookie-parser` Express middleware?
- What are signed cookies and why are they useful?
- What are HTTP sessions and what are they used for?
- What is the use of the `express-session` Express middleware?

5. What are REST APIs and how can we implement them using Express? (CLO 1, CLO 2)
- What does the term web service mean?
- What do the terms collection and resources mean in a REST API?
- How does a REST API support each of the 4 CRUD operations?
- What is required for a REST API to be stateless?
- What are route parameters?
- What is the URL pattern and HTTP method used for creating a resource?
- What is the URL pattern and HTTP method used for reading one resource using its ID?
- What is the URL pattern and HTTP method used for reading an entire collection?
- What is the URL pattern and HTTP method used for updating one resource using its ID?
- What is the URL pattern and HTTP method used for deleting one resource using its ID?

Explorations

Use the pages within this module to explore the following concepts:

- **Exploration — HTTP Methods and Headers (https://canvas.oregonstate.edu/courses/1879154/pages/exploration-http-methods-and-headers)**
- **Exploration — HTTP Status Code (https://canvas.oregonstate.edu/courses/1879154/pages/exploration-http-status-code)**
- **Exploration — HTTP Cookies and HTTP Sessions (https://canvas.oregonstate.edu/courses/1879154/pages/exploration-http-cookies-and-http-sessions)**
- **Exploration — REST API (https://canvas.oregonstate.edu/courses/1879154/pages/exploration-rest-api)**
- **Exploration — Implementing REST APIs using Express (https://canvas.oregonstate.edu/courses/1879154/pages/exploration-implementing-rest-apis-using-**

express)

Task List

Please make sure to complete the following assignments and other tasks:

- Complete the exercises provided in the Explorations.
- Take the Module quiz.
- Start Assignment 7.
- Complete the Module Feedback Survey

Return to Modules (https://canvas.oregonstate.edu/courses/1879154/modules)