



College of Engineering, Construction & Living Sciences  
Bachelor of Information Technology  
ID607001: Introductory Application Development Concepts  
Level 6, Credits 15  
**Project 1: Node.js REST API**

## Assessment Overview

In this **individual** assessment, you will develop a **REST API** using **Node.js** & deploy it to **Heroku**. You will choose the theme of your **REST API**. It could be on sport, culture, food or something else you are interested in. Your **REST API** data will be stored in a **MongoDB Atlas** database. The main purpose of this assessment is to demonstrate your ability to develop a **REST API** using taught concepts such as queries, relationships, authentication, validation, seeding & rate limits. However, you will be required to independently research & implement more complex concepts such as filtering, sorting, pagination & automated code formatting. In addition, marks will be allocated for code elegance, documentation & **Git** usage.

## Learning Outcome

At the successful completion of this course, learners will be able to:

1. Design & build secure applications with dynamic database functionality following an appropriate software development methodology.

## Assessment Table

Assessment Activity	Weighting	Learning Outcome	Assessment Grading Scheme	Completion Requirements
Practical: Node.js REST API Testing Research	20%	1	CRA	Cumulative
Project 1: Node.js REST API	30%	1	CRA	Cumulative
Project 2: React CRUD	50%	1	CRA	Cumulative

## Conditions of Assessment

You will complete this assessment during your learner-managed time. However, there will be time to discuss the requirements & your assessment progress during the teaching sessions. This assessment will need to be

completed by **Thursday, 14 April 2022 at 4.59 PM.**

## Pass Criteria

This assessment is criterion-referenced (CRA) with a cumulative pass mark of **50%** across all assessments in **ID607001: Introductory Application Development Concepts**.

## Submission

You must submit all program files via **GitHub Classroom**. Here is the URL to the repository you will use for your submission – <https://classroom.github.com/a/hWjmBeNq>. The latest program files in the **master** or **main** branch will be used to mark against the **Functionality** criterion. Please test your **master** or **main** branch application before you submit. Partial marks **will not** be given for incomplete functionality. Late submissions will incur a **10% penalty per day**, rolling over at **5:00 PM**.

## Authenticity

All parts of your submitted assessment must be completely your work. If you use code snippets from **GitHub**, **StackOverflow** or other online resources, you must reference it appropriately using **APA 7th edition**. Provide your references in the **README.md** file in your repository. Failure to do this will result in a mark of **zero** for this assessment.

## Policy on Submissions, Extensions, Resubmissions & Resits

The school's process concerning submissions, extensions, resubmissions & resits complies with **Otago Polytechnic** policies. Learners can view policies on the **Otago Polytechnic** website located at <https://www.op.ac.nz/about-us/governance-and-management/policies>.

## Extensions

Familiarise yourself with the assessment due date. If you need an extension, contact the course lecturer before the due date. If you require more than a **seven days** extension, a medical certificate or support letter from your manager may be needed.

## Resubmissions

Learners may be requested to resubmit an assessment following a rework of part/s of the original assessment. Resubmissions are to be completed within a negotiable short time frame & usually must be completed within the timing of the course to which the assessment relates. Resubmissions will be available to learners who have made a genuine attempt at the first assessment opportunity & achieved a **D grade (40-49%)**. The maximum grade awarded for resubmission will be **C-**.

## Resits

Resits & reassessments are not applicable in **ID607001: Introductory Application Development Concepts**.

## Exemplar

You can find an exemplar here - <https://id607001-graysono.herokuapp.com/api>

Here are some useful request URLs:

- Register - <https://id607001-graysono.herokuapp.com/api/register>
- Login - <https://id607001-graysono.herokuapp.com/api/login>
- Logout - <https://id607001-graysono.herokuapp.com/api/logout>
- Get departments - <https://id607001-graysono.herokuapp.com/api/v1/departments>
- Get institutions - <https://id607001-graysono.herokuapp.com/api/v1/institutions>
- Get institution by id - <https://id607001-graysono.herokuapp.com/api/v1/institutions/622f3f79f234941a786417c3>
- Get institution sorted by name & order by ascending - [https://id607001-graysono.herokuapp.com/api/v1/institutions?sort\\_by=name&order\\_by=asc](https://id607001-graysono.herokuapp.com/api/v1/institutions?sort_by=name&order_by=asc)
- Get institution sorted by region & order by descending - [https://id607001-graysono.herokuapp.com/api/v1/institutions?sort\\_by=region&order\\_by=desc](https://id607001-graysono.herokuapp.com/api/v1/institutions?sort_by=region&order_by=desc)
- Get first three institutions - <https://id607001-graysono.herokuapp.com/api/v1/institutions?limit=3>
- Get institutions on page 2 - <https://id607001-graysono.herokuapp.com/api/v1/institutions?page=2>
- Get all institutions in the Otago region - <https://id607001-graysono.herokuapp.com/api/v1/institutions?region=Otago>
- Endpoint not found - <https://id607001-graysono.herokuapp.com/api/v1/hello>

## Instructions

You will need to submit a **REST API** & documentation that meet the following requirements:

**Note:** Independent research requirements are highlighted yellow.

### Functionality - Learning Outcome 1 (40%)

- **REST API** is developed using **Node.js**.
- **REST API** can run locally without modification.
- **Five collections** containing at least **three fields** of data which you can interact with. **Note:** It includes a **user collection**.
- **Independent Research:** The **user collection** must contain the following fields - **first\_name**, **last\_name**, **email** & **password**. The **password** is salted and hashed.
- A range of different data types, i.e., all **fields** of data can not be of a single type.
- **Two relationships** between **collections**.
- Each **collection** has a separate **controller** & **route** file.
- A **controller** & **route** file for **authentication**. The **controller** file must contain operations for register, login & logout.
- A **controller** & **route** file for each collection except **User**. Each **controller** file must contain operations for **CRUD** (Create, Read, Update & Delete).
- **Independent Research:** The **index route**, i.e., **localhost:3000/** must display all of the available **routes** in the application.
- Each **field** of data has custom validation when creating & updating a **document**.
- Each **collection** is seeded with a **.js** file. **Note:** This is **only** for testing purposes.
- **Independent Research:** **REST API** version is set to **v1**. For example, an endpoint should look like **/api/v1/items**
- Return success, i.e., true or false & data when performing **authentication** & **CRUD** operations.
- **Independent Research:** Return a success & failure message when performing **authentication** & **CRUD** operations.
- **Independent Research:** Return an appropriate message if a request does not return any **REST API data**, i.e., empty array.

- **Independent Research:** Return an appropriate message if an endpoint does not exist.
- **Independent Research:** Filter & sort **REST API data** using query parameters. A consumer should be able to filter all **fields** of data & sort **fields** of data in ascending/descending order.
- **Independent Research:** Paginate the **REST API data** so that any number of records can be displayed per page. The default number is 10 records per page.
- **GET, POST, PUT & DELETE** routes are protected using **JSON Web Tokens (JWT)**.
- **REST API** rate limit is set to 25 requests per minute. You must display the following message if the user exceeds the 25 requests per minute - **"You have exceeded the number of requests per minute: 25. Please try again later."**
- Secure **HTTP** headers using **Helmet**.
- **REST API** is deployed to **Heroku**. The **REST API** should be usable i.e., a consumer should be able to perform operations on your **REST API**.
- **REST API data** is stored in a **MongoDB Atlas** database.

## Code Elegance - Learning Outcome 1 (40%)

- Use of intermediate variables. No method calls as arguments.
- Idiomatic use of control flow, data structures & in-built functions.
- Sufficient modularity.
- Functions & variables are named appropriately.
- Efficient algorithmic approach, i.e., using the appropriate function(s) when querying your **collections**.
- **REST API** resource groups named with a plural noun instead of a noun or verb, i.e., **/api/v1/items** not **/api/v1/item**.
- File header comments using **JSDoc**. You **need** to explain the purpose of each **controller** & **route** file.
- In-line comments using **JSDoc**. You **need** to explain complex logic that is not obvious.
- **Independent Research:** Code files are formatted using **Prettier** & a **.prettierrc** file. You **need** to declare a **npm** script in your application's **package.json** file which automates this process. Rules **should** include:
  - Single quote is set to **true**.
  - Semi-colon is set to **false**.
  - Tab-width is set to **2**.
- **Independent Research:** **Prettier** is installed as a development dependency.
- Declare a **npm** script in your application's **package.json** file which seeds the **collections**.
- No dead or unused code.
- Database configured for the development & production environments.
- Application's environment variables are stored in a **.env** file.
  - Create **example.env** file containing all of the application's environment variables' key. It is for the development environment.
  - Do not include the environment variables' value.

## Documentation & Git Usage - Learning Outcome 1 (20%)

- **Independent Research:** Project board to help you organise & prioritise your work.
- **REST API** is documented using **Postman**.
  - You **should** provide an example for each route.
  - Each example **should** contain a description, request & response.
- Provide the following in your repository **README.md** file:
  - URL to the documented **REST API** on **Postman**.
  - URL to the **REST API** on **Heroku**.

- How do you setup the development environment, i.e., after the repository is cloned, what do you need to do before you run the **REST API**?
- How do you deploy the **REST API** to **Heroku**?
- How do you format the code using **Prettier**?
- How do you seed the **collections**?
- Use of **Markdown**, i.e., bold text, code blocks, etc.
- Correct spelling & grammar.
- Your **Git commit messages** should:
  - Reflect the context of each functional requirement change.
  - Be formatted using the naming conventions outlined in the following:
    - \* **Resource:** <https://dev.to/i5han3/git-commit-message-convention-that-you-can-follow-1709>

## Additional Information

- Attempt to commit at least **10** times per week.
- **Do not** rewrite your **Git** history. It is important that the course lecturer can see how you worked on your assessment over time.