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IT314 – Software Engineering
GROUP – 9

UNIT TESTING



STAYEASY – HOTEL BOOKING SYSTEM

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Introduction

This documentation will provide you an overview of the unit testing performed for our group project using various testing tools particularly Jest and Istanbul. Early AI VS Code extension has been used for the automated test generation. It covers back-end testing with details of code coverage, methodology and benefits.

1 Tools & Frameworks

- **Jest:** A robust JavaScript testing framework that verifies the correctness of your codebase.
- **Istanbul:** A tool for generating detailed code coverage reports for JavaScript applications.
- **Early AI:** An AI tool assistant that helps generating the test codes for the testing purpose.

2 Why is Testing Important?

⇒ **White Box Testing:** Focuses on analysing and verifying the internal logic and structure of the code. Also, referred to as structural or logic-driven testing, that contrasts with black-box testing, which emphasizes on input-output behaviour. White-box testing delves into the code's internal mechanics to ensure correctness.

⇒ **Unit Testing**

- **Bug Detection:** Helps identify issues early in development, reducing their impact on the project.
- **Improved Code Quality:** Promotes the creation of clean, modular, and maintainable code.
- **Faster Debugging:** Quickly isolates problems during test failures, accelerating the resolution process.

3 Backend Unit Testing









⇒ Overall Coverage

All files controllers

97.03% Statements 262/270 90.9% Branches 128/132 96.87% Functions 31/32 96.96% Lines 256/264

Press *n* or *j* to go to the next uncovered block, *b*, *p* or *k* for the previous block.

Filter:

File ▲		Statements	Branches	Functions	Lines	
bookings.controller.js		96.49%	55/57	91.89%	34/37	100%
hotels.controller.js		98.14%	53/54	86.66%	26/30	100%
loginhandle.js		100%	14/14	100%	4/4	100%
manager.controller.js		100%	45/45	100%	16/16	100%
passwordResetController.js		86.66%	26/30	62.5%	5/8	66.66%
registerhandle.js		91.66%	11/12	83.33%	5/6	100%
updateProfile.js		100%	10/10	100%	2/2	100%
user.controller.js		100%	48/48	96.55%	28/29	100%

[Figure: Code coverage after backend testing]

4 Procedure

- First of all, set up the jest framework in the VS Code. And download the Early AI's extension that helps us automating the process of generating the test codes.
- Make sure to export the controllers which you are going to test before generating the code.
- Early AI tool will create the test suites that contains numerous test cases for the code to be tested.
- Run the suites and identify the issues in the code/test-code. Debug the changes to improve the code coverage up to the satisfactory level.
- Generate the coverage report through Istanbul tool to verify the coverage.

Conclusion

- ⇒ Unit testing plays a vital role in ensuring the quality, maintainability, and reliability of the project. Comprehensive testing was conducted using Jest, Istanbul and Early AI to thoroughly cover the back-end functionalities.