

# Testing and Code Review

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## 1. Change History

Change Date	Modified Sections	Rationale
<i>Nothing to show</i>		

## 2. Back-end Test Specification: APIs

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

#### 2.1.1. Tests

##### Notes API

Interface	Describe Group Location, No Mocks	Describe Group Location, With Mocks
POST /api/notes	backend/src/__tests__/unmocked/notes.normal.test.ts#L40	backend/src/__tests__/mocked/notes.mocked.test.ts#L1
PUT /api/notes/:id	#L282	#L202
DELETE /api/notes/:id	#L398	#L298
GET /api/notes/:id	#L462	#L253
GET /api/notes	#L528	#L343
GET /api/notes/:id/workspaces	#L893	#L620
POST /api/notes/:id/share	#L662	#L665
POST /api/notes/:id/copy	#L784	#L764

##### Workspaces API

Interface	Describe Group Location, No Mocks	Describe Group Location, With Mocks
POST /api/workspace	backend/src/__tests__/unmocked/workspace.normal.test.ts#L45	backend/src/__tests__/mocked/workspace.normal.test.ts#L45
GET /api/workspace/personal	#L167	#L277
GET /api/workspace/user	#L290	#L330
GET /api/workspace/:id	#L352	#L364
GET /api/workspace/:id/members	#L410	#L398
GET /api/workspace/:id/tags	#L454	#L448
GET /api/workspace/:id/membership/:userId	#L536	#L482
POST /api/workspace/:id/members	#L619	#L516
POST /api/workspace/:id/leave	#L847	#L694
PUT /api/workspace/:id	#L959	#L712
PUT /api/workspace/:id/picture	#L1051	#L748
DELETE /api/workspace/:id/members/:userId	#L1156	#L784
DELETE /api/workspace/:id	#L1323	#L818
GET /api/workspace/:id/poll	#L1429	#L852

##### Authentication API

Interface	Describe Group Location, No Mocks	Describe Group Location, With Mocks	Mocked
POST /api/auth/signup	backend/src/__tests__/unmocked/auth.normal.test.ts#L123	backend/src/__tests__/mocked/auth.mocked.test.ts#L74	authSe Google works
POST /api/auth/signin	#L151	#L290	authSe
POST /api/auth/dev- login	#L68	#L394	authSe

**User API**

Interface	Describe Group Location, No Mocks	Describe Group Location, With Mocks
GET /api/users/profile	backend/src/__tests__/unmocked/user.normal.test.ts#L39	—
PUT /api/users/profile	#L57	backend/src/__tests__/mocked/user.mocked.test.ts#L48
DELETE /api/users/profile	#L166	#L104
POST /api/users/fcm- token	#L230	#L155
GET /api/users/:id	#L273	#L209
GET /api/users/email/:email	#L318	#L260

**Message API**

Interface	Describe Group Location, No Mocks	Describe Group Location, With Mocks
GET /api/messages/workspace/:workspaceId	backend/src/__tests__/unmocked/message.normal.test.ts#L61	backend/src/__tests__/mocked/message.m
POST /api/messages/workspace/:workspaceId	#L188	#L91
DELETE /api/messages/:messageId	#L261	#L134

**Media API**

Interface	Describe Group Location, No Mocks	Describe Group Location, With Mocks	Mocked
POST /api/media/upload	backend/src/__tests__/unmocked/media.normal.test.ts#L56	backend/src/__tests__/mocked/media.mocked.test.ts#L55	stor file s

**2.1.2. Commit Hash Where Tests Run**

c5f46d61177b82ff74c9c30dfd32a5e24de5d683

**2.1.3. How to Run the Tests**

1. cd backend
2. npm install
3. npm test

**2.2. GitHub Actions Configuration Location**

~/.github/workflows/backend-tests.yml

**2.3. Jest Coverage Report Screenshots (Without Mocking)**

File	%Stmts	%Branch	%Funcs	%Lines	Uncovered Line #s
All files	81.78	61.56	88.35	81.9	
asyncHandler.util.ts	100	100	100	100	
auth.controller.ts	43.18	23.07	66.66	43.18	23-38,47,53,59,74-106,121-131
auth.middleware.ts	98.14	100	100	98.07	68
auth.routes.ts	100	100	100	100	
auth.service.ts	43.63	11.11	50	43.63	17-40,47,53,59-96
auth.types.ts	100	100	100	100	
constants.ts	100	100	100	100	
database.ts	0	0	0	0	1-44
errorHandler.middleware.ts	100	100	100	100	
logger.util.ts	100	50	100	100	7-11
media.controller.ts	94.11	80	100	94.11	48
media.routes.ts	100	100	100	100	
media.service.ts	89.28	78.26	100	89.09	72,81,104-105,112,128
message.model.ts	100	100	100	100	
message.routes.ts	86.95	76.92	100	86.95	18,53-54,64,98-99,109,130-131
message.types.ts	100	100	100	100	
note.model.ts	100	100	100	100	
notes.controller.ts	82.11	50	100	82.11	...6-27,35-36,60-61,81-82,98-99,107-108,141,149-150,175-176,183,206-207
notes.routes.ts	100	100	100	100	
notes.service.ts	73.45	65.9	76.47	76.69	40,146,161,221,251-287
notes.types.ts	100	100	100	100	
notification.service.ts	65	33.33	50	65	7,46-63
routes.ts	100	100	100	100	
sanitizeInput.util.ts	100	100	100	100	
storage.ts	94.73	66.66	100	94.73	13
user.controller.ts	65.43	12	100	65.43	15-16,33,39,49-57,65,91-99,107,117,126-134,161-169,178,196-204
user.model.ts	75.4	80	90	75.4	113-114,122-123,137-138,146-162
user.routes.ts	100	100	100	100	
user.types.ts	100	100	100	100	
validation.middleware.ts	91.66	100	100	90.9	23
workspace.controller.ts	82.95	54.44	100	82.95	...-286,321,329-330,370,378-379,409,417-418,449,457-458,489,496-497,517
workspace.model.ts	100	100	100	100	
workspace.routes.ts	100	100	100	100	
workspace.service.ts	99.46	97.91	100	99.42	50
workspace.types.ts	100	100	100	100	

```

Test Suites: 6 passed, 6 total
Tests:      218 passed, 218 total
Snapshots:  0 total
Time:       8.724 s, estimated 15 s
Ran all test suites matching __tests__\unmocked/i.

```

## 2.4. Jest Coverage Report Screenshots (With Mocking)

File	%Stmts	%Branch	%Funcs	%Lines	Uncovered Line #s	Add to Chat %L
All files	71.61	57.22	69.17	71.99		
asyncHandler.util.ts	75	100	66.66	100		
auth.controller.ts	100	92.3	100	100	112	
auth.middleware.ts	38.88	0	50	36.53	18-22,27-31,41-45,53-57,61-65,79-120	
auth.routes.ts	100	100	100	100		
auth.service.ts	92.72	88.88	100	92.72	108-109,126-127	
auth.types.ts	100	100	100	100		
constants.ts	100	100	100	100		
database.ts	100	100	100	100		
errorHandler.middleware.ts	90.9	100	50	88.88	6	
logger.util.ts	100	100	100	100		
media.controller.ts	88.23	60	100	88.23	16,24	
media.routes.ts	100	100	100	100		
media.service.ts	80.35	65.21	80	81.81	22,34,45,96,102,116-124	
message.model.ts	100	100	100	100		
message.routes.ts	81.15	23.07	100	81.15	24,31,35,41,51,70,77,81,96,114,120,124,128	
message.types.ts	100	100	100	100		
note.model.ts	100	100	100	100		
notes.controller.ts	79.67	75	100	79.67	...121,129-130,137-138,157-158,163,171-172,179-180,192,215-216,219-220	
notes.routes.ts	100	100	100	100		
notes.service.ts	67.25	56.81	64.7	66.01	58,70-107,122,125,131,137,149,163-207,227,236,243	
notes.types.ts	100	100	100	100		
notification.service.ts	100	100	100	100		
routes.ts	100	100	100	100		
sanitizeInput.util.ts	88.88	0	100	83.33	7	
storage.ts	94.73	66.66	100	94.73	39	
user.controller.ts	75.3	88	100	75.3	19,44,70-86,120-121,143,150-156,185-191	
user.model.ts	73.77	20	90	73.77	85-90,102-111,132,188-206	
user.routes.ts	100	100	100	100		
user.types.ts	100	100	100	100		
validation.middleware.ts	83.33	0	66.66	81.81	13-16	
workspace.controller.ts	71.59	65.55	100	71.59	...404-405,431,440-441,444-445,467,476-477,480-481,484-485,503,512-513	
workspace.model.ts	100	100	100	100		
workspace.routes.ts	100	100	100	100		
workspace.service.ts	21.5	10.41	15.78	21.96	13-38,53-118,130,138-189,196,202,208,214,220,226,255,271-477	
workspace.types.ts	100	100	100	100		

```

Test Suites: 6 passed, 6 total
Tests:      184 passed, 184 total
Snapshots:  0 total
Time:       17.137 s, estimated 27 s
Ran all test suites matching __tests__\mocked/i.

```

## 2.5. Combined Jest Coverage Reports (With & Without Mocking)

File	% Stmt	% Branch	% Funcs	% Lines	Uncovered Line #s
All files	100	100	100	100	
asyncHandler.util.ts	100	100	100	100	
auth.controller.ts	100	100	100	100	
auth.middleware.ts	100	100	100	100	
auth.routes.ts	100	100	100	100	
auth.service.ts	100	100	100	100	
auth.types.ts	100	100	100	100	
constants.ts	100	100	100	100	
database.ts	100	100	100	100	
errorHandler.middleware.ts	100	100	100	100	
logger.util.ts	100	100	100	100	
media.controller.ts	100	100	100	100	
media.routes.ts	100	100	100	100	
media.service.ts	100	100	100	100	
message.model.ts	100	100	100	100	
message.routes.ts	100	100	100	100	
message.types.ts	100	100	100	100	
note.model.ts	100	100	100	100	
notes.controller.ts	100	100	100	100	
notes.routes.ts	100	100	100	100	
notes.service.ts	100	100	100	100	
notes.types.ts	100	100	100	100	
notification.service.ts	100	100	100	100	
routes.ts	100	100	100	100	
sanitizeInput.util.ts	100	100	100	100	
storage.ts	100	100	100	100	
user.controller.ts	100	100	100	100	
user.model.ts	100	100	100	100	
user.routes.ts	100	100	100	100	
user.types.ts	100	100	100	100	
validation.middleware.ts	100	100	100	100	
workspace.controller.ts	100	100	100	100	
workspace.model.ts	100	100	100	100	
workspace.routes.ts	100	100	100	100	
workspace.service.ts	100	100	100	100	
workspace.types.ts	100	100	100	100	

```

Test Suites: 13 passed, 13 total
Tests:       403 passed, 403 total
Snapshots:   0 total
Time:        35.87 s
Ran all test suites.

```

### 3. Back-end Non-functional Requirements

#### 3.1. Test Locations

Non-Functional Requirement	Location in Git
Backend – Search Speed	ThingSpace.ts/backend/src/_tests_/notes.latency.test.ts
Frontend – Two-Click Navigation	frontend/app/src/androidTest/java/com/cpen321/usermanagement/TestReachWithTwoClicks.kt

#### Backend – Search Speed ([notes.latency.test.ts](#))

- **How to run:** cd backend && npm test -- \_tests\_/non-func-tests
- **What it checks:** Seeds 400 notes, issues three representative search queries, and reports the mean latency. Latest runs average ~1.1s/query, comfortably under the 5s budget.

#### Frontend – Two-Click Navigation ([TestReachWithTwoClicks.kt](#))

- **How to run:** cd frontend && ./gradlew connectedAndroidTest -Pandroid.testInstrumentationRunnerArguments.class=com.cpen321.usermanagement.TestReachWithTwoClicks
- **What it checks:** Starting from the main workspace screen, the test traverses to note, template, and chat views—both within the current workspace and across other workspaces—counting taps to confirm every note-bearing screen is reachable in ≤2 clicks.

#### 3.2. Test Verification and Logs

##### Performance: Search Speed

- Creates 400 notes, runs 3 queries, average ~1.1s (<5s target)
- Logs:

```

console.log
  Search latency test passed: average 1120.00ms < 5000ms

    at Object.<anonymous> (src/__tests__/notes.latency.test.ts:224:15)

PASS Backend Tests src/__tests__/notes.latency.test.ts (8.436 s)
  Notes API – Latency Test (Non-Functional Requirement)
    GET /api/notes – Search Latency Test
      ✓ Search query latency should be under 5 seconds with 400 notes (5898 ms)

Test Suites: 1 passed, 1 total
Tests:       1 passed, 1 total
Snapshots:   0 total
Time:        8.562 s
Ran all test suites matching /notes.latency.test.ts/i.

```

## 4. Front-end Test Specification

This includes the non-functional requirement that every note/message containing screen must be reachable from the main screen within two clicks. This non-functional requirement can only be verified via frontend tests, hence it is included here as [TestReachWith2Clicks.kt](#).

### 4.1. Location in Git

```
./frontend/app/src/androidTest/java/com.cpen321.usermanagement
```

### 4.2. Tests Included

Test of the "Collaborate" Feature ([TestCollaborate.kt](#))

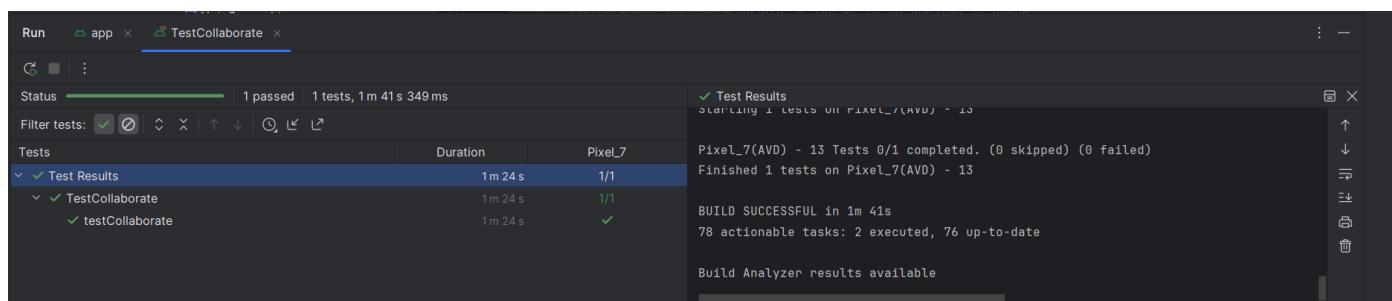
**Prerequisite:**

1. Need 2 user accounts:
  - Workspace Manager
  - Workspace Member
2. Workspace Manager must have a workspace named "**Test**"
3. There must be **no existing workspaces** named "Study" or "Study v2"

**Scenario Steps and Test Case Steps**

Scenario Steps	Test Case Steps
<b>Create Workspace</b>	
1. The user opens the "Create Workspace" screen.	Open the "Create Workspace" screen.
2. The app shows input fields and a disabled button.	Verify "Pick a workspace name" and disabled "Create Workspace" button.
3a. User enters workspace title already taken.	Pre-create workspace "Test". Enter "Test" and click Create.
3a1. App shows error.	Check for dialog: " <b>Failed to create workspace.</b> "
3. User enters valid title.	Enter "Studies". Verify "Create" button enabled.
4. User clicks "Create".	Click "Create". Verify workspace setup screen shown and "Studies" appears in list.
<b>Update Workspace</b>	
10. Manager navigates to "Edit Workspace".	<After workspace creation, one is already at the edit workspace screen>
11. Edit title and bio.	Change title to "Studies v2" and bio "Study group"; click Save; expect "Profile updated successfully."
<b>Invite to Workspace</b>	
5. Member selects "Invite User".	Open Studies v2 → Manage Workspace → Invite icon.
6. App shows input and button.	Verify email field + "Invite to Workspace" button visible.
7a. Enter invalid email.	Enter "invalidemail", click Invite.
7a1. Error message shown.	Check: " <b>Could not retrieve profile matching the given email!</b> "
7. Enter valid email.	Input teammate email → click Invite → expect " <b>The user got added to the workspace.</b> "
7b. Invite already-member user.	Enter existing member email and click Invite.
7b1. Error message.	<b>"The user is already a member!"</b>

Scenario Steps	Test Case Steps
<b>Send Chat Message</b>	
8. User opens workspace chat.	Open chat icon; verify chat screen shown.
9a. Empty message.	Send blank message; verify no change.
9. Valid message.	Send "Hello team!"; verify appears with picture & timestamp.
<b>Update Workspace as Non-Manager</b>	
10a. Non-manager tries editing workspace.	Log out as the manager. Open edit screen as non-manager → fields should be greyed out.
<b>Leave Workspace (Non-Manager)</b>	
12. Non-manager clicks Leave.	Open Studies v2 → Leave Workspace.
13. App removes user.	Studies v2 no longer appears in workspace list.
<b>Ban Users</b>	
14. Manager opens Members screen.	Log in as manager → Workspaces Screen → <select "Studies v2"> → Manage Workspace → Members icon.
15. Manager bans user.	Click trash next to user.
16. User banned permanently.	User removed, cannot be re-invited → " <b>That user is banned</b> " message should show upon an invite attempt
<b>Delete Workspace</b>	
17. Manager deletes workspace.	Click Delete Workspace (trash icon).
18. Workspace deleted.	Studies v2 disappears and an appropriate success message is shown.



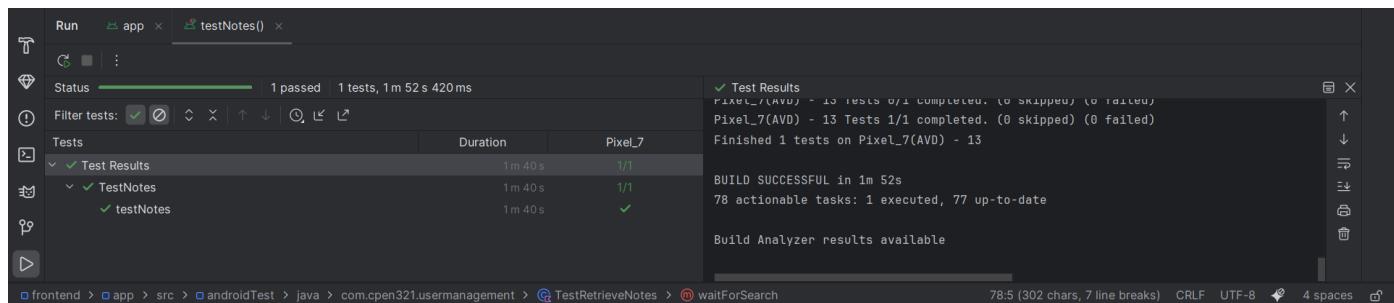
### Test of the "Manage Notes" Feature ([TestNotes.kt](#))

#### Prerequisite:

Two pre-existing workspaces.

Scenario Steps	Test Case Steps
<b>Create Note</b>	
1. Open "Create Note" screen.	Tap pencil icon.
2. App shows metadata fields and create button.	Verify "Note Type", "Tags", "Fields".
3a. Create note with no fields.	Click Create with no fields.
3a1. Error.	<b>"Please add at least one field"</b>
3b. Create note with empty field label.	Add field but leave label blank; click Create.
3b1. Error.	<b>"All fields must have a label"</b>
3. User fills fields.	Add tag(s), add field "Notes", enter content.
4. Click Create.	
5. Note created.	Verify note appears.
<b>Update Note</b>	
6. Open note to edit.	Click pencil icon on note.
7. App shows editable fields.	Verify tag add/remove.
8. Modify content & tags.	
9. Click Save.	
10. Note updated.	Verify new values.
<b>Share Note</b>	

Scenario Steps	Test Case Steps
11. Select "Share Note".	Click Share icon.
12. Workspace selection dialog.	Verify "Share Note" + workspace list.
13. Select workspace & confirm.	Click Share.
14. Note shared.	<b>"Note shared to workspace successfully"</b> , note moves workspaces
<b>Copy Note</b>	
15. Select "Copy Note".	Click Copy icon.
16. Workspace selection.	Verify UI.
17. Select workspace.	Click Copy.
18. Note copied.	Appears in both workspaces.
<b>Delete Note</b>	
19. Select "Delete Note".	Tap trash.
20. Confirmation dialog.	<b>"Are you sure... cannot be undone"</b>
21. Confirm.	Click Delete.
22. Note deleted.	Verify removal.

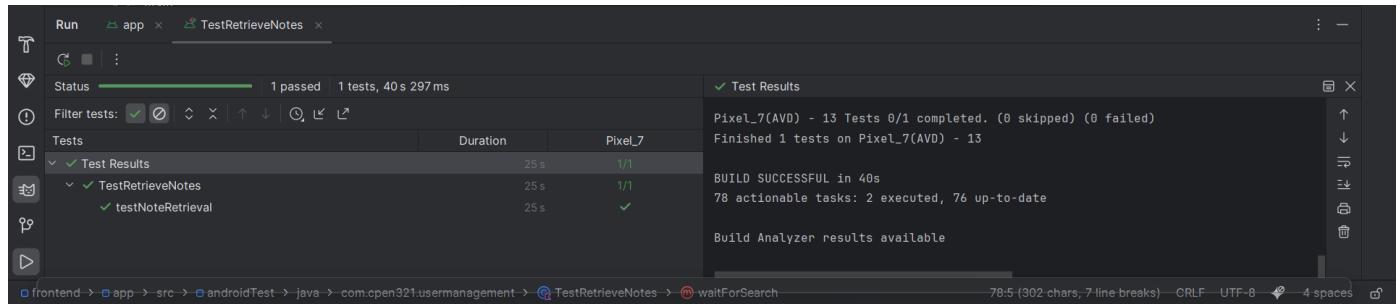


## Test of the “Retrieve Notes” Feature ([TestRetrieveNotes.kt](#))

### **Prerequisite:**

Existing workspace with notes.

Scenario Steps	Test Case Steps
<b>Search Notes</b>	
1. Open workspace.	Navigate to workspace.
2. Search bar visible.	Verify presence.
3a. Empty query.	Search blank.
3a1. All notes shown.	Verify list.
3. Enter query.	Input string → Search.
4. Matching notes shown.	Relevant notes at top.
<b>Filter Notes by Tags</b>	
5. Click filter icon.	
6. Tag selection screen.	Verify "All" + checkboxes.
7. Select "All".	All tags selected.
9. Deselect "All".	All tags cleared.
11. Select specific tags.	
12. Go back.	
13. Filter applied.	Only matching notes. Ordered according to the search query.



### Test: Reach Note Screens in ≤2 Clicks ([TestReachWith2Clicks.kt](#))

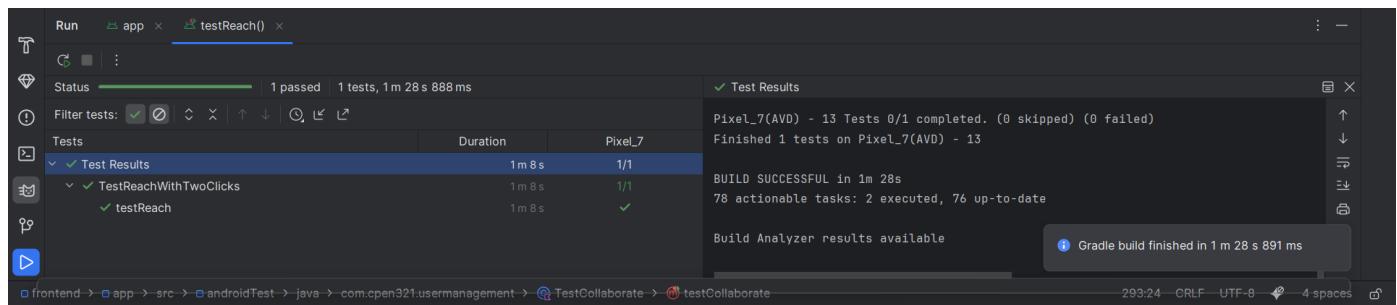
This test verifies that from a workspace main screen, users can reach:

- templates screen
- chat screen
- content/templates/chat of another workspace

All screens must be reachable in **2 clicks or fewer**.

The test counts the number of clicks for each navigation path.

### Test Logs



## 5. Automated Code Review Results

### 5.1. Commit Hash Where Codacy Ran

[96e4c5520f47503662f56029212714c229f3617f](#)

### 5.2. Unfixed Issues per Codacy Category

## Issues breakdown



### All clear!

When issues come up, you'll be able to see here the issues breakdown per category.

5.3. Unfixed Issues per Codacy Code Pattern

## Issues

ⓘ Current 0 ⚡ Ignored 0

Filter by

Languages ▾

Severities ▾

Categori

All issues

0

#### 5.4. Justifications for Unfixed Issues

No unfixed codacy issues