

IT314
Software Engineering
Group 17
Online Coding Learning Platform



Blackbox Testing Report
Submitted by Sanyam Shah (202301137)



Prof Saurabh Tiwari
Mentor: Utsav Kanani

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Blackbox Testing By Sanyam Shah (202301137)

Features Covered - User Profile, Roadmap, Quizzes, Notes, Change Password

Summary

In this report, I have done a comprehensive blackbox testing of Roadmap and User Profile features which also included quizzes, notes and change password modules. I have divided the possible input fields into equivalence classes and have specified test values for each and analysed the system behaviour. While most features functioned correctly, the following edge cases were identified

Key Edge Cases Identified

Critical edge cases

1. When a user regenerates a new quiz, the options previously selected are automatically selected and submitted by the system.
2. The system failed to properly store and display user answers for past quizzes.
3. In the change password module, I was able to change passwords that were unsecure like (low complexity for eg aaaaaaa) or overly long passwords (> 200 characters) which should not be valid.

Other Bugs

1. No limit in word count for explanation tab
2. No limit in word count for notes tab
3. Profile Photo/ Avatar failed to upload
4. Numbering and bullet points not visible in notes
5. System allows saving empty notes
6. After previewing a note, there is no button to go back to editor, need to manually click on note to open.
7. Roadmap on same topic can be generated multiple times.

User Profile

1. Bio

| Class | Input Range | Test Value | Results | Expected Output |
|-------|-------------------------|--------------|--|-----------------|
| EC1 | 0–1000 characters | 0 | Valid (bio saved) | Valid |
| EC2 | > 1000 characters | 1001 | Invalid (only saves first 1000 characters) | Invalid |
| EC3 | Contains emojis/symbols | Random emoji | Valid (bio saved) | Valid |

2. Location

| Class | Input Range | Test Value | Results | Expected Output |
|-------|---------------------------|------------|---------------------|-----------------|
| EC4 | Valid city name | Ahmedabad | Saved and displayed | Valid |
| EC5 | Empty | [Blank] | Saved and displayed | Invalid |
| EC6 | Contains numbers | 12345 | Saved and displayed | Invalid |
| EC7 | Contains symbols | \$%#@ | Saved and displayed | Invalid |
| EC8 | A city that doesn't exist | Carpedoism | Saved and displayed | Invalid |

3. Profile Picture/ Avatar upload

| Class | Input Range | Test Value | Results | Expected Output |
|-------|-------------------------------|---------------------------|---|---------------------|
| EC1 | JPG/PNG 5MB | < 5MB | Upload failed | Valid (will upload) |
| EC2 | Unsupported format (PDF, TXT) | Trying to select pdf file | System does not allow to select pdf/txt files | Invalid |
| EC3 | > 5MB file | > 5MB | Upload failed | Invalid |
| EC4 | Corrupted image file | Corrupted image selected | Upload failed | Invalid |

There is a bug in this feature which is preventing valid formats too from not being uploaded.

4. Statistics

All of this are visible and correct

Total generated courses

Completed Courses

Current Streak

Max streak

5. Calender

Calender clearly highlights in which days I was active. Also the right and left buttons work properly and desired dates are visible.

6. Notes

All notes that I have made are clearly visible in the notes section. Note that new notes saved are displayed after refreshing page. Also note that testing of input of notes is present in roadmap section below.

7. Roadmaps

All roadmaps that I have made are also visible in the section. All pinned roadmaps are also visible.

| Class | Input Range | Test Value | Results | Expected Output |
|-------|----------------------|------------|-----------------------------|-----------------|
| EC1 | 1 or more roadmaps | N/A | Display list | Valid |
| EC2 | 0 roadmaps | N/A | Shows no roadmaps available | Valid |
| EC3 | Roadmap item clicked | N/A | Opens roadmap | Valid |
| EC4 | Pinned roadmap | N/A | Pinned roadmap visible | Valid |

8. Links (for Github, Twitter, LinkedIn etc)

| Class | Input Range | Test Value | Results | Expected Output |
|-------|------------------------------------|----------------------|---------|-----------------|
| EC1 | Valid GitHub username | Example: sanyam-shah | Saved | Valid |
| EC2 | Valid GitHub URL | My github URL | Saved | Valid |
| EC3 | Empty field | [blank] | Saved | Valid |
| EC4 | Invalid username (symbols, spaces) | user@123 | Saved | Invalid |
| EC5 | Invalid URL format | Example: http/adj | Saved | Invalid |

All things same for linkedin and twitter
EC4 and EC5 failed.

9. Change Password

9.1 Current Password

| Class | Input Range | Test Value | Results | Expected Output |
|-------|------------------------------|----------------------------|------------------------|-----------------|
| EC1 | Correct current password | Correct password entered | Valid | Valid |
| EC2 | Incorrect current password | Incorrect password entered | Invalid | Invalid |
| EC3 | Current password field empty | [Blank] | Please fill all fields | Invalid |

9.2 New password

| Class | Input Range | Test Value | Results | Expected Output |
|-------|---|-------------------|---|---|
| EC1 | 6–50 characters (valid range) | 6, 50 | Valid (password accepted) | Valid |
| EC2 | < 6 characters | 5 | Password must be at least 6 characters long | Invalid |
| EC3 | > 50 characters | 51, 200 | Password accepted | Invalid |
| EC4 | Contains uppercase, lowercase, number, symbol | Example: Abc@1234 | Valid | Valid |
| EC5 | Same as old password | Example: aaaaaaa | Password accepted | Invalid (should display same as old password) |
| EC6 | Empty field | Blank | Please fill all fields | Invalid |

Verdict: EC3 and EC5 failed

9.3 Confirm New Password

| Class | Input Range | Boundary Value | Results | Expected Output |
|-------|------------------------------|----------------|----------------------------------|-----------------|
| EC1 | Matches new password exactly | eg abcd | Password changed successfully | Valid |
| EC2 | Does not match new password | eg agcd | Shows doesn't match new password | Invalid |
| EC3 | Empty confirm password | [Blank] | Shows please fill all fields | Invalid |

10. Download Notes

On clicking download notes, all notes in that roadmap is downloaded successfully.

Roadmap

1. Create Roadmap (Topic Input)

| Class | Input Range | Test Value | Results | Expected Output |
|-------|---|------------------------------------|---|--|
| EC1 | Valid Topic | Python | Roadmap generates successfully. | Valid. Roadmap generates successfully. |
| EC2 | Valid Topic with special characters | C++ or C# | Roadmap generates successfully. | Valid. Roadmap generates successfully. |
| EC3 | Empty Input | [Blank] | The system shows you to first enter text | Invalid. Error message displayed |
| EC4 | Input without meaning | asdfjkl; | The system shows that the topic is not related to programming | Invalid. Error message displayed |
| EC5 | Massive input | > 500 chars | While you could paste as much text you want, when you click to generate roadmap, it does show 500 char limit. | Invalid. Error message displayed |
| EC6 | A roadmap is generated which already exists | Eg generating TypeScript two times | Generates another roadmap | Invalid. Should display roadmap already exists |

Verdict: All test cases except EC6 passed

2. Module Explanation

| Class | Input Range | Test Value | Results | Expected Output |
|-------|------------------------------|------------------------|---|---|
| EC6 | Empty Input | [Empty] | The system generates explanation in default style | Valid. The system generates explanation in default style |
| EC7 | Valid Prompt | Explain like I am 5 | The system generates response according to prompt | Valid. The system generates response according to prompt |
| EC8 | Specific Context type prompt | Focus on code examples | The system generates response according to prompt | Valid. Explanation generates with a heavier emphasis on code blocks. |
| EC9 | Non English Input | Explicar en Español | The system does explain the topic in spanish | Valid. AI should detect language and provides the explanation in Spanish. |
| EC10 | Massive input (>500 lines) | 10000 word lorem ipsum | Unlike roadmap generation, the system does not have a word limit here | Invalid. System shows error message that word limit exceeded. |

Verdict: EC10 failed, all others passed (can add big input)

3. Quiz

| Class | Input Range | Test Value | Results | Expected Output |
|-------|------------------------------|--|---|--|
| EC11 | Generate Quiz | Clicking Generate Quiz button | Quiz generated successfully | Valid. Quiz is generated |
| EC12 | Tab Navigation | Clicking Past Quizzes tab | Past quizzes visible | Valid. View displays previous quiz attempts |
| EC13 | View Past Quiz | Clicking quiz 1 | Previous quiz is displayed but previous results not shown | Valid. Previous quiz and its results should be displayed |
| EC14 | Submit Answer (Per Question) | Eg select option A, then submit | Correct/ Incorrect shown | Valid. Immediate answer provided (Correct/Incorrect) for that specific question. |
| EC15 | Empty state | Click past quizzes when no quiz has yet been generated | No past quizzes found. | Valid. Shows No past quizzes found. |

Critical Bug

There is a critical bug here is that when we generate quiz, select all options and then submit, when we again generate new quiz all options that we previously selected are displayed by default. Also our answers to the previous quiz are not stored.

4. Notes

| Class | Input Range | Test Value | Results | Expected Output |
|-------|---|--|--|---|
| EC16 | Text Formatting (bold/ italic/ underline etc) | Clicking on Bold/ Italic etc icons | The text is properly formatted as per input | Valid. Text is formatted. |
| EC17 | Code Block Formatting | Clicking Code icon <> and then type code | The code is formatted properly in gray box | Valid. Text is formatted in a box (markdown style). |
| EC18 | Bullet and Numbering List | Adding numbering, bullet and check list | Bullet and numbered list are not visible, while you cannot check in checklist | Valid. Appropriate output should be displayed |
| EC19 | Preview Toggle | Clicking Preview button | Editor displays notes clearly | Valid. Editor displays notes clearly |
| EC20 | Images | Adding images URL | Image is displayed | Valid. Image is displayed |
| EC21 | Images | Adding incorrect image URL | Image is not displayed only dummy icon displayed | Invalid. System should display a dummy icon |
| EC22 | Import Functionality | Select valid file | Note imported successfully | Valid. Content of the file is populated into the editor area. |

| | | | | |
|------|---------------------|-----------------------------------|--|--|
| EC23 | Import Invalid File | Importing pdf or image | The system prompts you to file manager and you can not select invalid files. | Invalid. You should be able to select invalid files or error message must be displayed |
| EC24 | Save Empty Note | Save note without typing anything | You can save empty notes | Invalid. Button should be disabled or error message must be displayed |
| EC25 | Save Valid Content | Enter text and save note | Notes saved successfully | Valid. Notes saved successfully |
| EC26 | Comments | Adding comment in markdown format | Not displayed in preview. | Valid. Not displayed in preview. |
| EC27 | Massive input | Adding lorem ipsum 10000 words | Note saved | Invalid. System should display error message saying exceeded word limit |

Verdict: EC19, EC24 and EC27 failed

Bugs identified

1. Numbered and bullet lists not displayed properly.
2. You can save empty note, the system does not show error message.
3. After clicking preview note, there is no back button, you have to click on note to get back.
4. There is no word limit in saving notes.

5. Articles and videos

There aren't any equivalent classes here but basically relevant videos and articles are fetched for the module. Sometimes the AI does hallucinate and gives invalid URL but this happens less often.

6. Timer and Stop Watch

| Class | Input Range | Test Value | Results | Expected Output |
|-------|---------------------------|----------------------|--|--|
| EC28 | Valid Time | 05:00 | Timer successfully counts down from five. | Valid. Timer starts counting down from 5 minutes. |
| EC29 | Boundary Zero | 00:00 | Start button is disabled | Invalid. Start button disabled or nothing happens. |
| EC30 | Negative Numbers | -5:00 | The system does not allow to make timer negative | Invalid. Input should prevent typing negative signs or autocorrect to 0. |
| EC31 | Seconds Boundary (Upper) | 00:60 | The system indeed does not allow to make it more than 59 seconds | Invalid. System should allow more than 59 seconds. |
| EC32 | Reset button in stopwatch | At 02:57 click reset | The system resets time | Valid. The system should reset time. |

Verdict: All test cases passed.

7. Saved Status

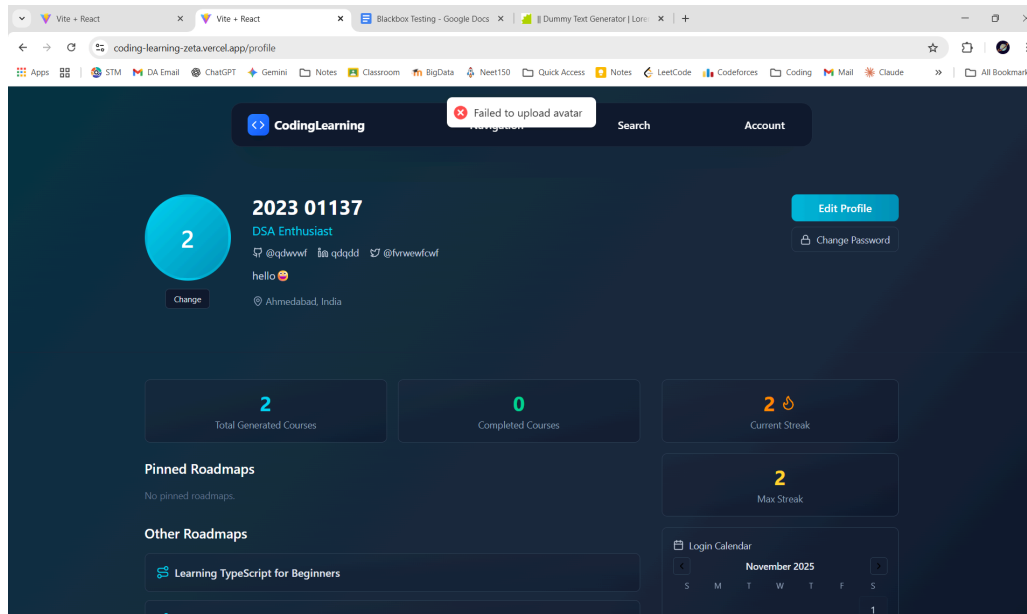
On refreshing everything is saved successfully including notes and explanations.

8. Progress Bar

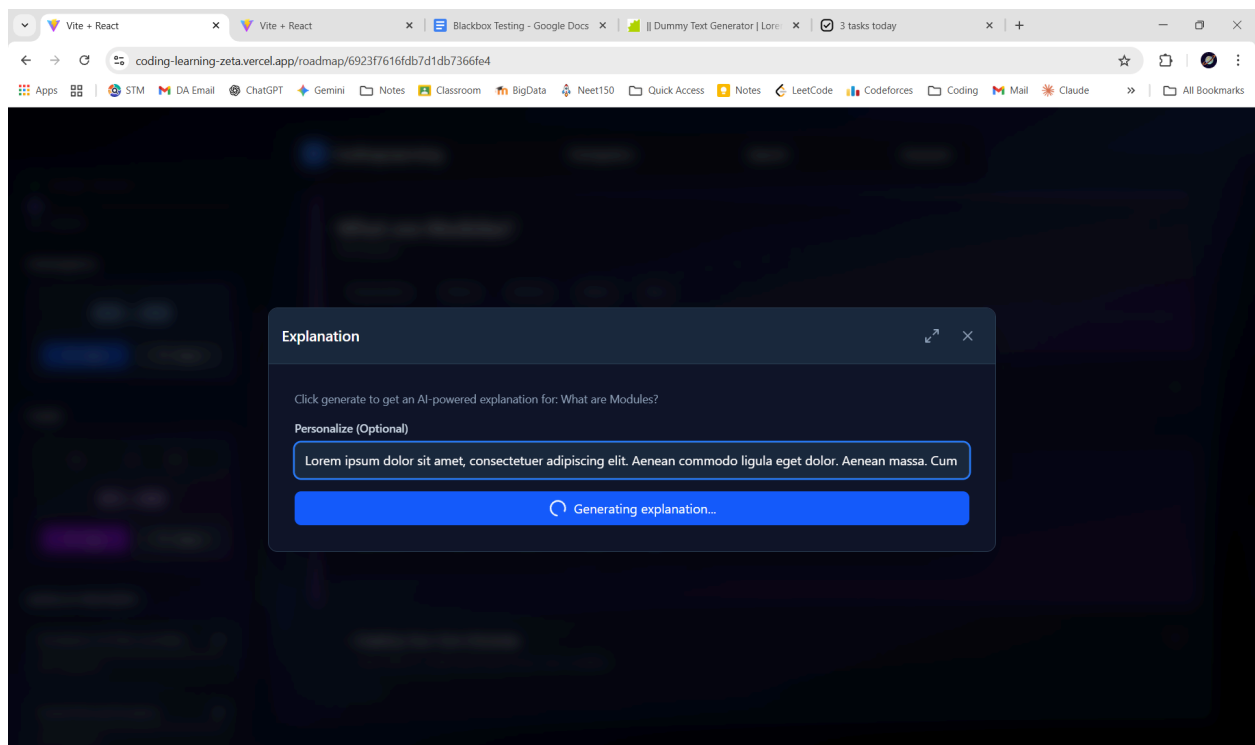
On selecting module as completed, status bar is updated accordingly.

Evidence

1. Avatar not being uploaded

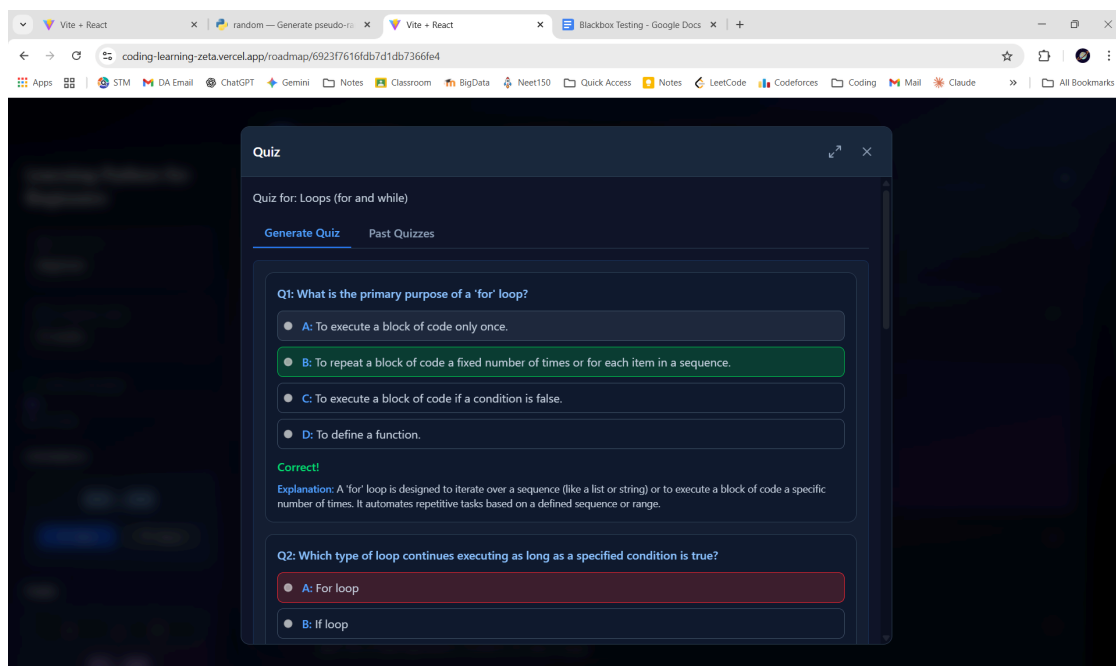
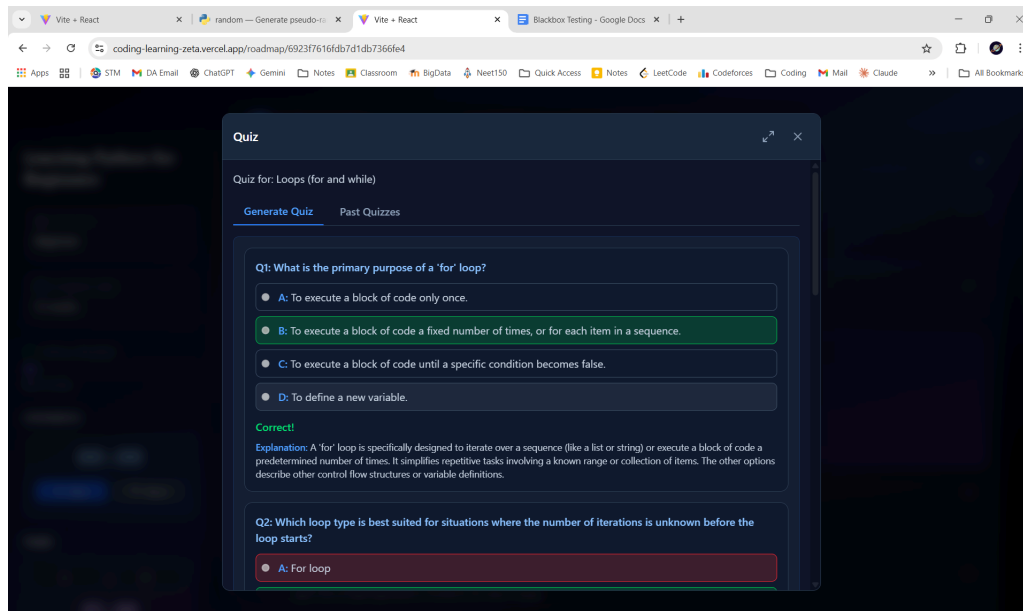


2. Can add any number of words in explanation tab (still LLM generates proper output)



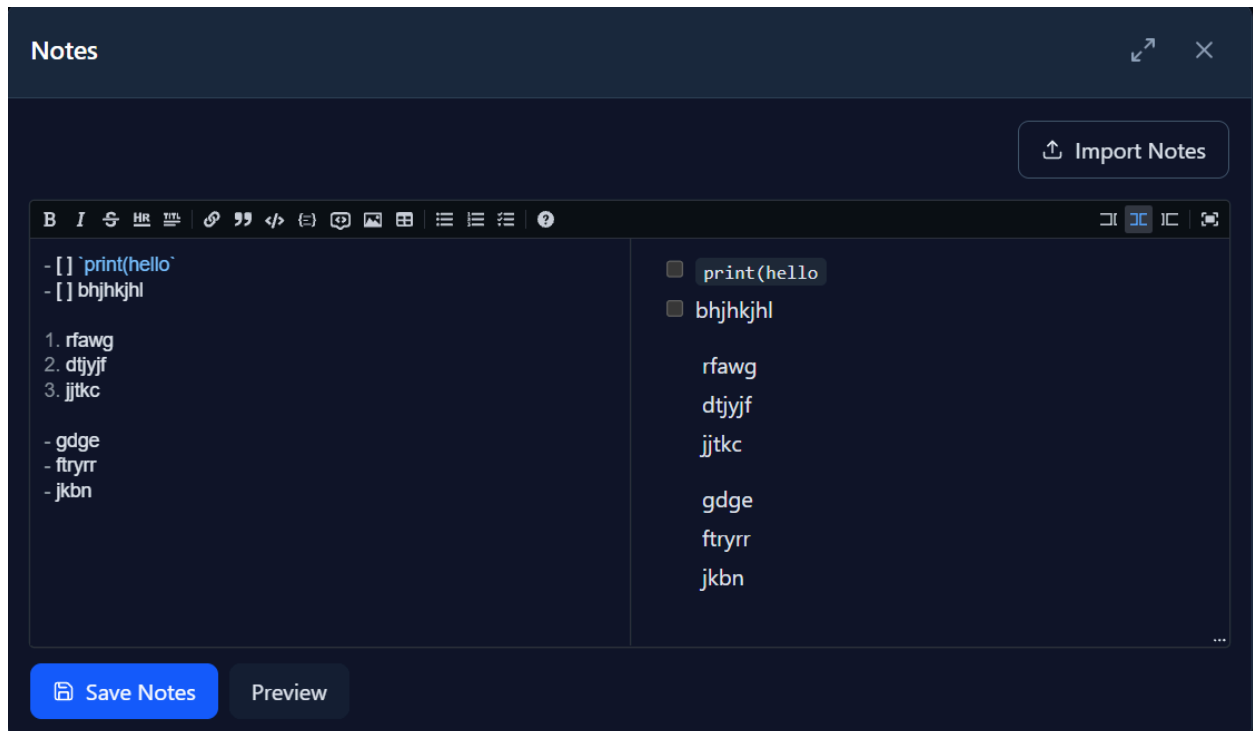
3. Critical bug in quiz

A major bug has been identified. After generating the quiz and selecting options and submitting, when I regenerate the quiz, the options are automatically selected and submitted by itself.



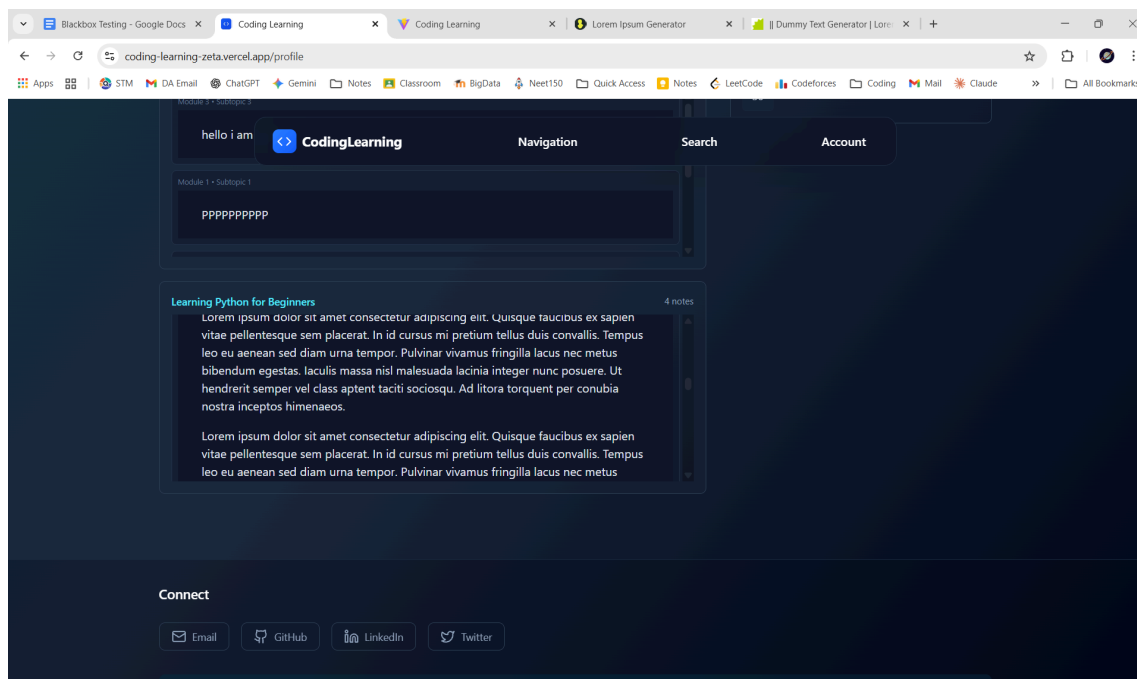
Also another thing is while the quiz is generated, even before attempting it, it can be stored in past quizzes. Past quizzes don't remember the answer and even I can select another option different from the one i selected in the original quiz.

4. Bullet , numberline and checklist in notes not being displayed



Also no option to go back from preview mode in notes, need to click randomly to get back

6. No word limit on notes (saved over 10000 characters)



Weak password

Very huge password

8. System allows saving empty notes

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Acceptance Testing Verdict

Here is a acceptance level verdict for each core feature

| Feature | Status | Remarks |
|-------------------------------|-------------|---|
| Roadmap Generation | Pass | Topic inputs, edge case handling (nonsense requests or too long), and special characters work properly. All modules are generated and save properly |
| Statistics & Timer | Pass | Streak tracking, progress bars, stopwatch, timer and calender function correctly without any error. |
| Edit Profile | Almost Pass | All features work properly except uploading profile picture |
| Notes | Almost Pass | All main functionality works, minor bugs include saving empty notes, no limit of words in notes and bullet and numeric list not visible clearly. |
| Quizzes | Fail | There are critical bugs regarding regenerating quiz as past options are already selected and submitted, which is unacceptable. |
| Change Password | Fail | Password update logic misses input validation |

Atleast the two critical bugs needs to be fixed in order to make this website production grade. It will be even better if all minor bugs are also fixed.