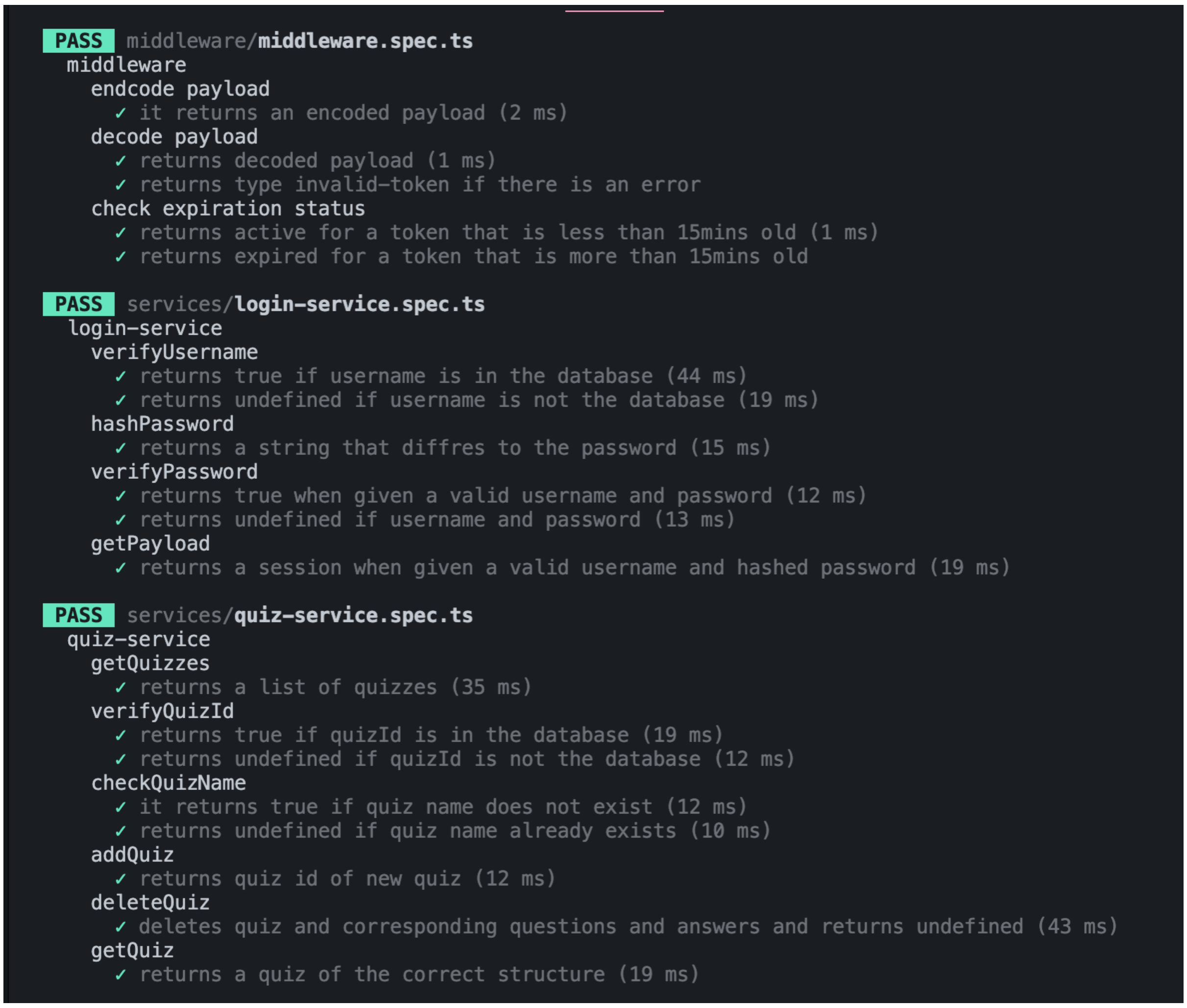
Test

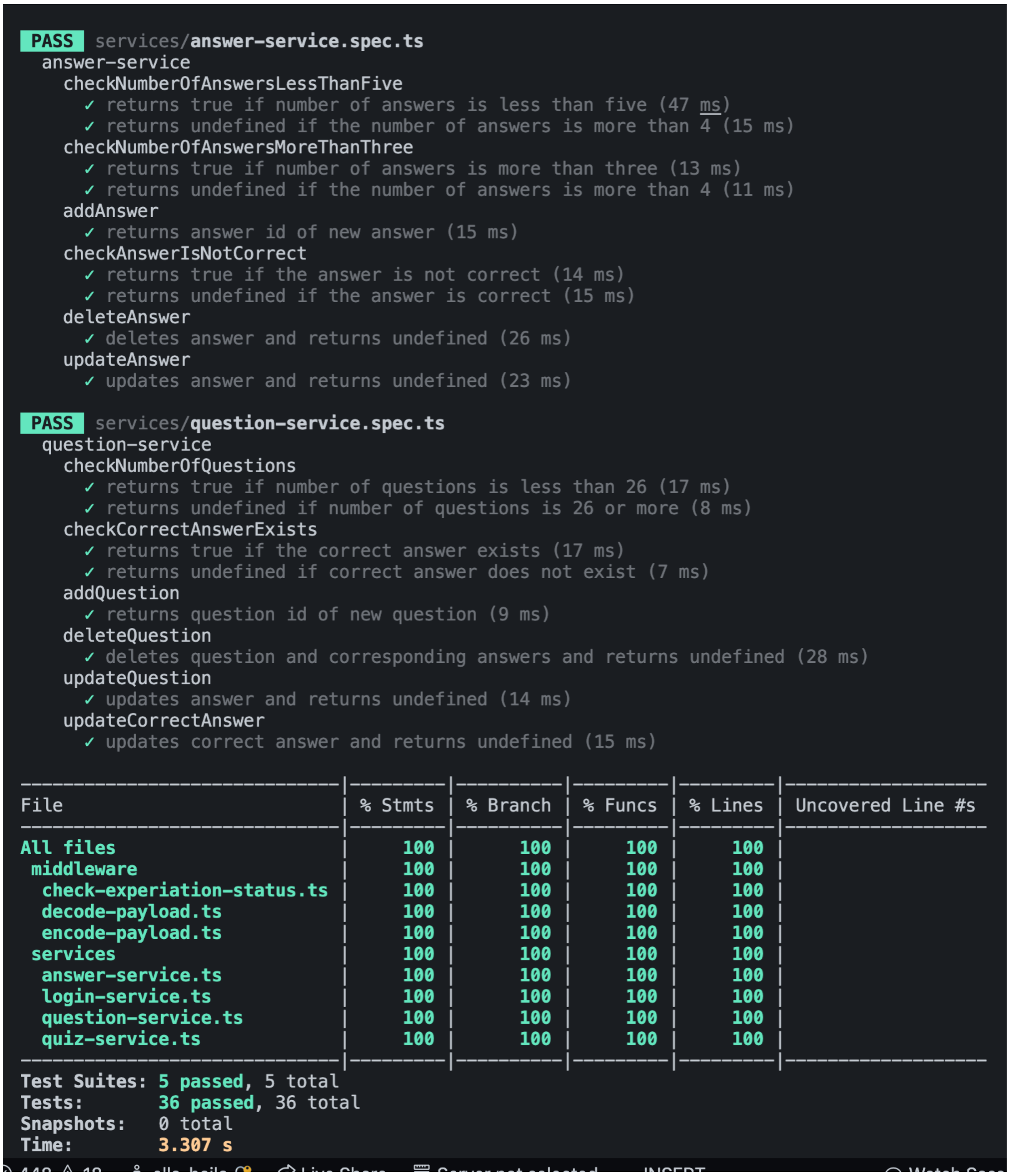
Unit tests



```
 PASS  middleware/middleware.spec.ts
  middleware
    endcode payload
      ✓ it returns an encoded payload (2 ms)
    decode payload
      ✓ returns decoded payload (1 ms)
      ✓ returns type invalid-token if there is an error
    check expiration status
      ✓ returns active for a token that is less than 15mins old (1 ms)
      ✓ returns expired for a token that is more than 15mins old

 PASS  services/login-service.spec.ts
  login-service
    verifyUsername
      ✓ returns true if username is in the database (44 ms)
      ✓ returns undefined if username is not the database (19 ms)
    hashPassword
      ✓ returns a string that diffres to the password (15 ms)
    verifyPassword
      ✓ returns true when given a valid username and password (12 ms)
      ✓ returns undefined if username and password (13 ms)
    getPayload
      ✓ returns a session when given a valid username and hashed password (19 ms)

 PASS  services/quiz-service.spec.ts
  quiz-service
    getQuizzes
      ✓ returns a list of quizzes (35 ms)
    verifyQuizId
      ✓ returns true if quizId is in the database (19 ms)
      ✓ returns undefined if quizId is not the database (12 ms)
    checkQuizName
      ✓ it returns true if quiz name does not exist (12 ms)
      ✓ returns undefined if quiz name already exists (10 ms)
    addQuiz
      ✓ returns quiz id of new quiz (12 ms)
    deleteQuiz
      ✓ deletes quiz and corresponding questions and answers and returns undefined (43 ms)
    getQuiz
      ✓ returns a quiz of the correct structure (19 ms)
```



```
 PASS  services/answer-service.spec.ts
  answer-service
    checkNumberOfAnswersLessThanFive
      ✓ returns true if number of answers is less than five (47 ms)
      ✓ returns undefined if the number of answers is more than 4 (15 ms)
    checkNumberOfAnswersMoreThanThree
      ✓ returns true if number of answers is more than three (13 ms)
      ✓ returns undefined if the number of answers is more than 4 (11 ms)
    addAnswer
      ✓ returns answer id of new answer (15 ms)
    checkAnswerIsNotCorrect
      ✓ returns true if the answer is not correct (14 ms)
      ✓ returns undefined if the answer is correct (15 ms)
    deleteAnswer
      ✓ deletes answer and returns undefined (26 ms)
    updateAnswer
      ✓ updates answer and returns undefined (23 ms)

 PASS  services/question-service.spec.ts
  question-service
    checkNumberOfQuestions
      ✓ returns true if number of questions is less than 26 (17 ms)
      ✓ returns undefined if number of questions is 26 or more (8 ms)
    checkCorrectAnswerExists
      ✓ returns true if the correct answer exists (17 ms)
      ✓ returns undefined if correct answer does not exist (7 ms)
    addQuestion
      ✓ returns question id of new question (9 ms)
    deleteQuestion
      ✓ deletes question and corresponding answers and returns undefined (28 ms)
    updateQuestion
      ✓ updates answer and returns undefined (14 ms)
    updateCorrectAnswer
      ✓ updates correct answer and returns undefined (15 ms)

------------------------------|---------|----------|---------|---------|-------------------
File                          | % Stmts | % Branch | % Funcs | % Lines | Uncovered Line #s
------------------------------|---------|----------|---------|---------|-------------------
All files                     |     100 |      100 |     100 |     100 |
 middleware                   |     100 |      100 |     100 |     100 |
  check-experiation-status.ts |     100 |      100 |     100 |     100 |
  decode-payload.ts           |     100 |      100 |     100 |     100 |
  encode-payload.ts           |     100 |      100 |     100 |     100 |
 services                     |     100 |      100 |     100 |     100 |
  answer-service.ts           |     100 |      100 |     100 |     100 |
  login-service.ts            |     100 |      100 |     100 |     100 |
  question-service.ts         |     100 |      100 |     100 |     100 |
  quiz-service.ts             |     100 |      100 |     100 |     100 |
------------------------------|---------|----------|---------|---------|-------------------
Test Suites: 5 passed, 5 total
Tests:       36 passed, 36 total
Snapshots:   0 total
Time:        3.307 s
```

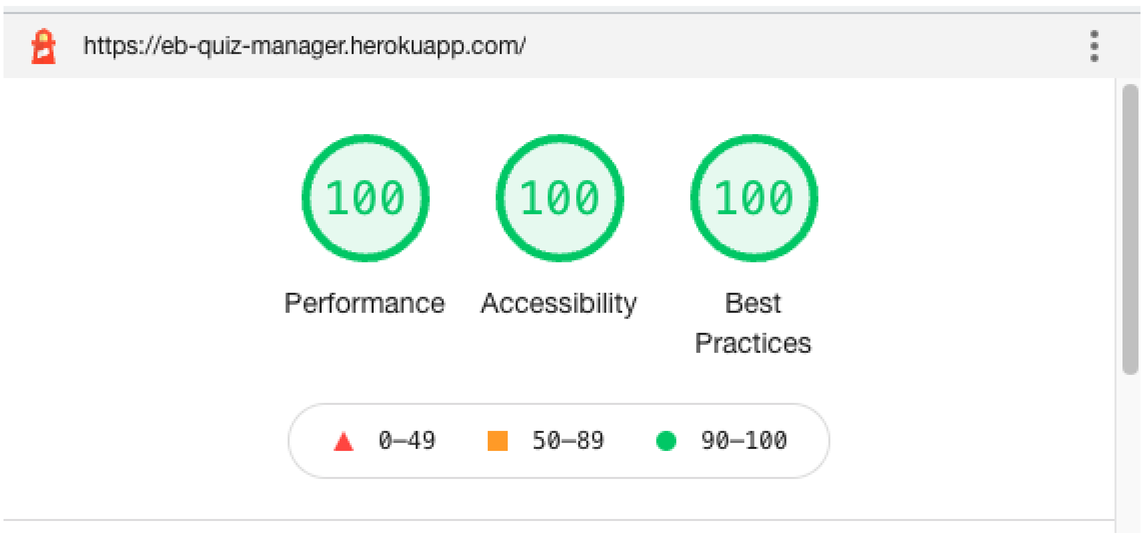
I used TDD whilst writing my sql queries and middleware to ensure that the code produced the expected result. I used a docker compose file to spin up different postgres instances containing the schema in order to test against a representative environment. Each query test suite runs against its own postgres instance to prevent interference between tests. E.g. The question test suite deletes a question, which is later relied on by the answer suite to add a question. All test suites are run on git commit to prevent bugs being introduced into the code.

Lighthouse testing

I used lighthouse report to check the sites performance, accessibility and best practise scores in order to help identify any issues.

The final results can be seen below.

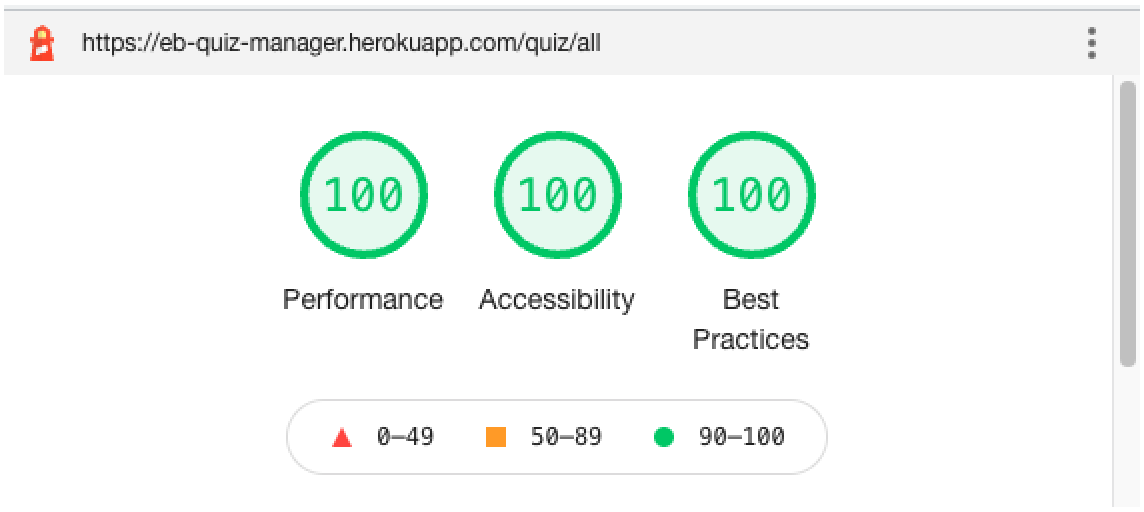
Login page ‘/’


https://eb-quiz-manager.herokuapp.com/

100 Performance
100 Accessibility
100 Best Practices

▲ 0–49 ■ 50–89 ● 90–100

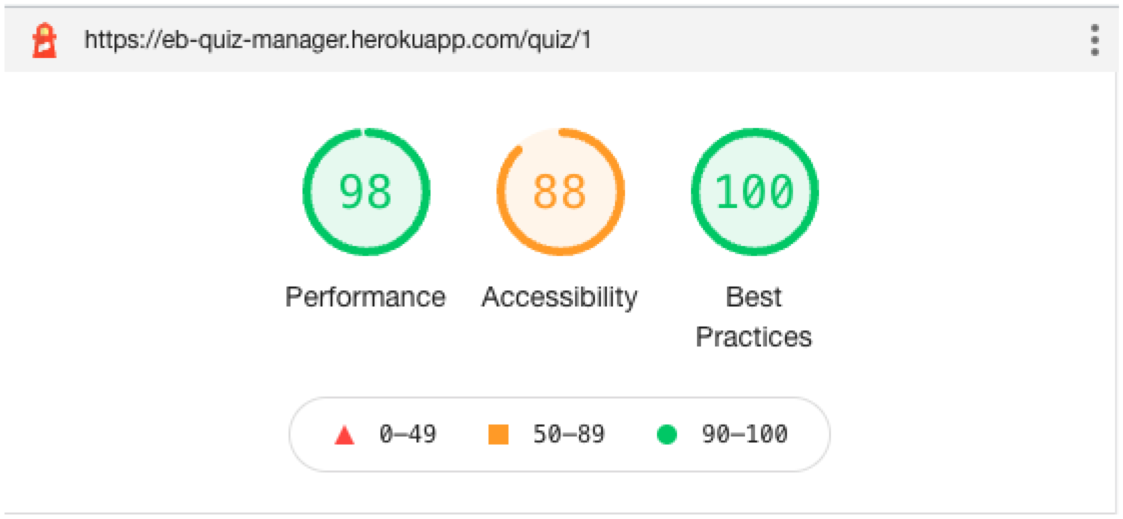
View all page ‘/quiz/all’


https://eb-quiz-manager.herokuapp.com/quiz/all

100 Performance
100 Accessibility
100 Best Practices

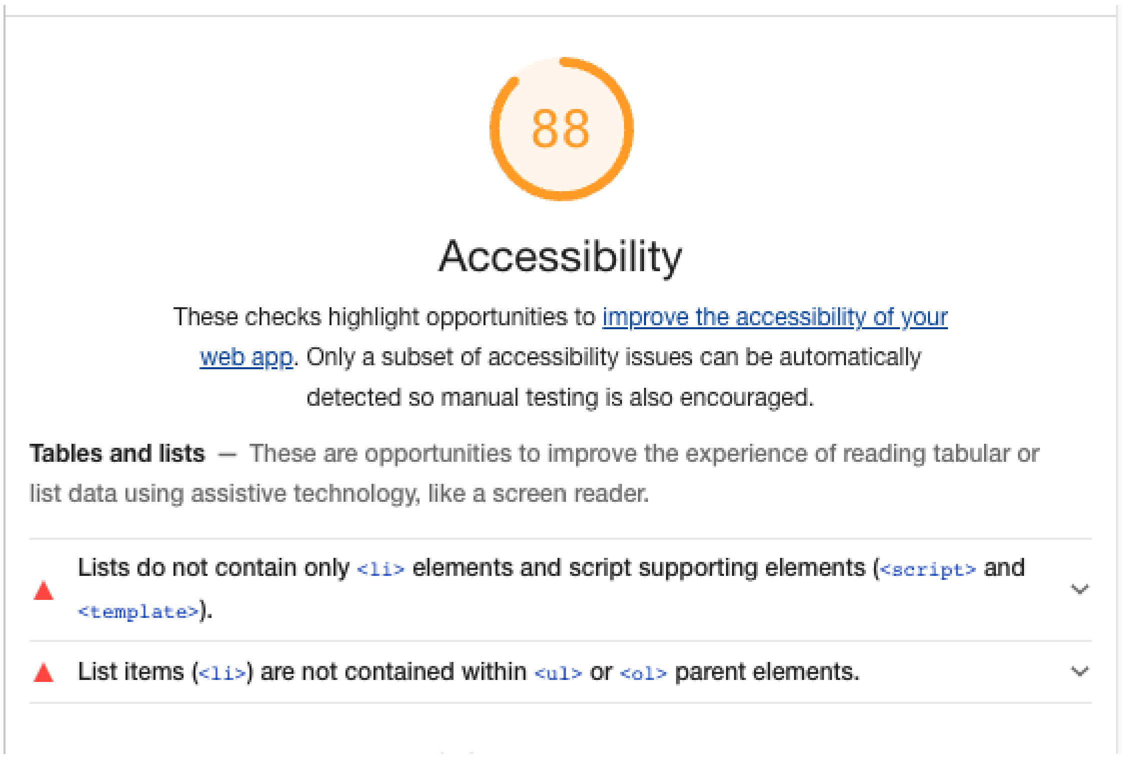
▲ 0–49 ■ 50–89 ● 90–100

View quiz page '/quiz/:id'


https://eb-quiz-manager.herokuapp.com/quiz/1

98 Performance
88 Accessibility
100 Best Practices

▲ 0–49 ■ 50–89 ● 90–100


88

Accessibility

These checks highlight opportunities to improve the accessibility of your web app. Only a subset of accessibility issues can be automatically detected so manual testing is also encouraged.

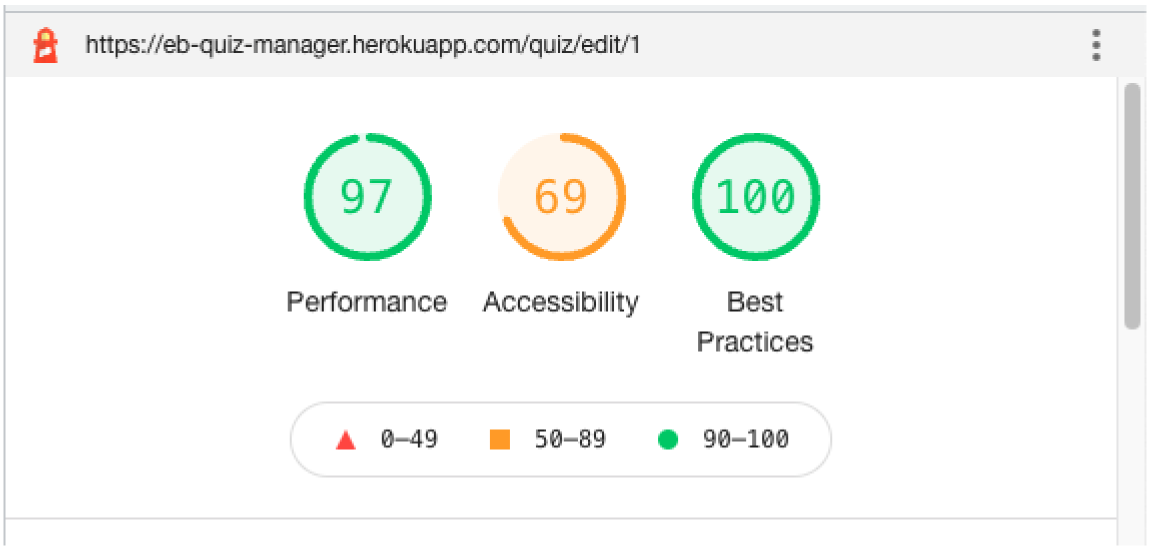
Tables and lists — These are opportunities to improve the experience of reading tabular or list data using assistive technology, like a screen reader.

▲ Lists do not contain only `<li>` elements and script supporting elements (`<script>` and `<template>`).

▲ List items (`<li>`) are not contained within `<ul>` or `<ol>` parent elements.

To produce lettering of each question, each question is contained in a div. Each div has an <li> element with type set to A inside it, and all question divs are contained inside of an <ol> element. The only other solution I could think of to solve this issue was writing a handlebars helper to work out alphabet letters of questions based on index. I, however, ran out of time to try this.

Edit quiz page '/quiz/edit/:id'

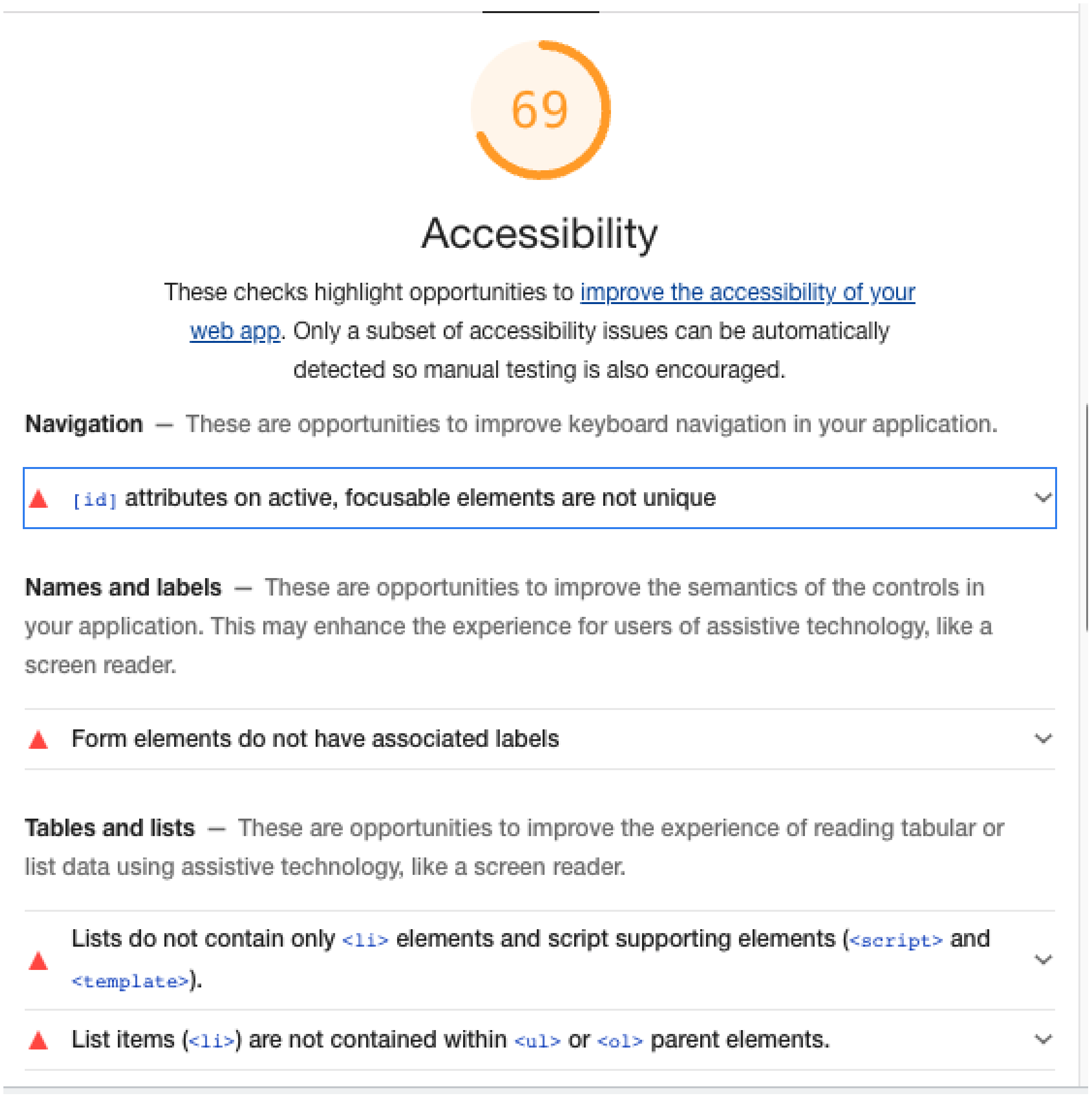

https://eb-quiz-manager.herokuapp.com/quiz/edit/1

97 Performance

69 Accessibility

100 Best Practices

▲ 0–49 ■ 50–89 ● 90–100


69

Accessibility

These checks highlight opportunities to improve the accessibility of your web app. Only a subset of accessibility issues can be automatically detected so manual testing is also encouraged.

Navigation — These are opportunities to improve keyboard navigation in your application.

▲ `[id]` attributes on active, focusable elements are not unique

Names and labels — These are opportunities to improve the semantics of the controls in your application. This may enhance the experience for users of assistive technology, like a screen reader.

▲ Form elements do not have associated labels

Tables and lists — These are opportunities to improve the experience of reading tabular or list data using assistive technology, like a screen reader.

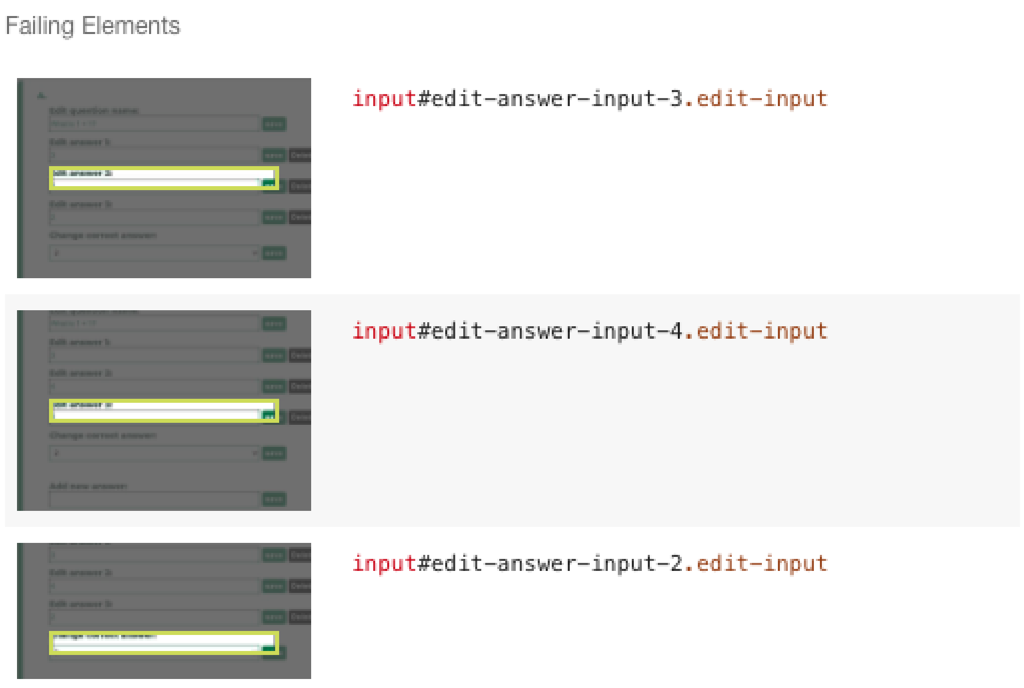
▲ Lists do not contain only `<li>` elements and script supporting elements (`<script>` and `<template>`).

▲ List items (`<li>`) are not contained within `<ul>` or `<ol>` parent elements.

This page had the same issues as above alongside an issue with form labels and unique ids on elements.

The form in question was the add question form, and upon looking at the code I could see that the form labels were present. I also checked this with voiceover for mac and was able to fill in the form and read the labels, however I admit that I still need to improve my use of screen readers and may have missed an anomaly from how most forms read.

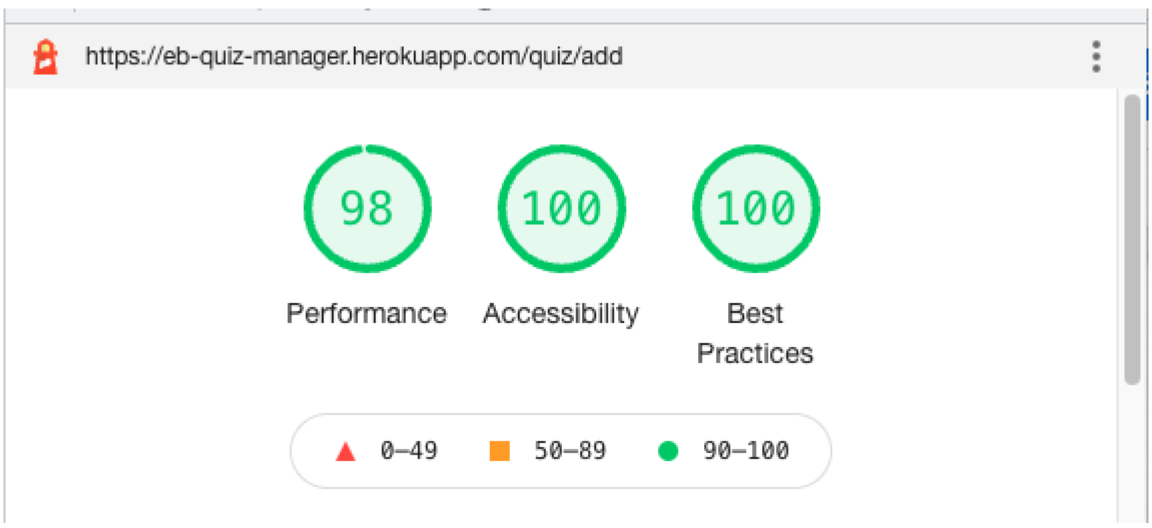
The unique id issue, again was not present, which can be seen in lighthouse itself:



Failing Elements

```
input#edit-answer-input-3.edit-input
input#edit-answer-input-4.edit-input
input#edit-answer-input-2.edit-input
```

Create quiz page '/quiz/new'



https://eb-quiz-manager.herokuapp.com/quiz/add

Manual testing

The manual test case document can be found completed in the testing folder. The only failing test was that logged out users are redirected to the login page when they visit any url. When visiting a made up url they are redirected to the 404 page. This is not the ideal behaviour however it does not create any issues.

Testing with screen reader

I did a run through of all the actions that can take place on the site with a screen reader, I was able to perform all actions however I think there are a few key areas for improvement which I will detail in the documentation section.