Testing Documentation

Introduction

The purpose of this document is to outline and demonstrate the implementation of testing in our project. In the following sections, testing formats and frameworks used, project-specific test implementations, and the process executing tests have been described. In addition, a demonstration of test suite output has been included at the end of the document.

Unit Testing

We have used unit testing to test individual functional components of our project, helping to ensure that things work as intended. In addition, these unit tests help us to better identify issues which arise after changes are made. To perform this testing, we have utilized the *jest* JavaScript unit testing framework, as well as several packages to support testing in the *React* environment, and a jest configuration has been written to integrate these packages and support *@babel*.

A complete list of packages utilized in the project can be found in the *package.json* file, and the jest configuration is contained within the *jest.config.json* file. The complete path to each of these files is shown here:

./TogetherDating/AdventureTogether/package.json
./TogetherDating/AdventureTogether/jest.config.json

The current set of unit tests can be found in the /src/tests/ directory of /AdventureTogether.

Behavior Driven Development (BDD) Testing

In addition to jest, we have implemented the *jest-cucumber* package, which runs on top of jest and allows for the integration of BDD testing. This approach to testing allows for feature-focused tests to be performed, specifically in the context of acceptance criteria, using the '*Given, When, Then'* format.

BDD tests are implemented in the /src/features/ directory of /AdventureTogether. Each test is comprised of two files: one which establishes a scenario in standard English, and another which links a set of behavioral tests to this scenario. A test passes when the scenario completes with the expected outcome. Our project currently contains one complete test, however with this framework implemented, we will move to implement additional acceptance tests in the following sprints.

Execution of Tests

Tests are configured to be executed via the command line using the *Yarn* utility for *node.js*. The project has been configured to execute all tests via the command *'yarn test'*. A report detailing the results of the testing suite is automatically generated by this process each time the tests are run.

Test Demonstration (Sprint 1)

Below is a screen capture of the sprint 1 test set being run against the submission repository:

```
C:\Users\jdhtl\Desktop\AdventureTogether>yarn run test
yarn run v1.22.15
$ jest
 PASS  src/tests/isOfAge.test.js
 PASS  src/tests/environment.firebaseConfig.test.js
 PASS  src/tests/localStorePut.test.js
 PASS  src/tests/localStoreGet.test.js
 PASS  src/tests/buildIsoDateString.test.js
 PASS  src/tests/exampleFunction.test.js
 PASS  src/tests/environment.cometConfig.test.js
 PASS  src/features/age-verification.steps.js
 PASS  src/tests/agePage.test.jsx
 PASS  src/tests/getAge.test.js
 PASS  src/tests/indexPage.test.jsx
 PASS  src/tests/navbar.test.jsx
---------------------------|---------|----------|---------|---------|-------------------
File                       | % Stmts | % Branch | % Funcs | % Lines | Uncovered Line #s
---------------------------|---------|----------|---------|---------|-------------------
All files                  |   18.07 |    36.36 |      25 |   18.07 |
 src                       |     7.4 |      100 |       0 |     7.4 |
  cometchat.js             |       0 |      100 |       0 |       0 | 4-54
  environment.js           |     100 |      100 |     100 |     100 |
  firebaseui.config.js     |       0 |      100 |     100 |       0 | 4-17
 src/methods               |   23.21 |    36.36 |   33.33 |   23.21 |
  MatchSort.js             |       0 |        0 |       0 |       0 | 3-33
  buildIsoDateString.js    |     100 |      100 |     100 |     100 |
  createEmailUser.js       |       0 |      100 |       0 |       0 | 7-16
  exampleFunction.js       |     100 |      100 |     100 |     100 |
  getAge.js                |     100 |       80 |     100 |     100 | 7
  isOfAge.js               |     100 |      100 |     100 |     100 |
  localStoreGet.js         |     100 |      100 |     100 |     100 |
  localStorePut.js         |     100 |      100 |     100 |     100 |
  registerEmailProfile.js  |       0 |      100 |       0 |       0 | 8-49
  registerGoogleProfile.js |       0 |      100 |       0 |       0 | 8-45
---------------------------|---------|----------|---------|---------|-------------------
Jest: "global" coverage threshold for statements (50%) not met: 18.07%
Jest: "global" coverage threshold for lines (50%) not met: 18.07%
Jest: "global" coverage threshold for functions (30%) not met: 25%

Test Suites: 12 passed, 12 total
Tests:       12 passed, 12 total
Snapshots:   0 total
Time:        7.246 s, estimated 12 s
Ran all test suites.
error Command failed with exit code 1.
info Visit https://yarnpkg.com/en/docs/cli/run for documentation about this command.
```

Each of the incorporated unit tests as well as the BDD test passes. We have not yet configured the coverage aspect of the testing framework such that it produces useful output, but aim do to so in the next sprints if feasible.

Test Demonstration (Sprint 2)

Below is a screen capture of the current test set being run against the submission repository:

```
C:\repos\wb-test\AdventureTogether>yarn test
yarn run v1.22.17
$ jest
 PASS  src/features/buildIsoDateString.steps.js
 PASS  src/features/age-verification.steps.js
 PASS  src/tests/functions.test.js
 PASS  src/tests/configs.test.js
 PASS  src/tests/components.test.jsx
 PASS  src/tests/pages.test.jsx (5.29 s)
  ● Console

    console.log
      null

  createEmailUser.js          |       0 |      100 |       0 |       0 | 7-15
  exampleFunction.js          |     100 |      100 |     100 |     100 |
  getAge.js                   |     100 |       80 |     100 |     100 | 7
  getImplicitInterests.js     |       0 |        0 |       0 |       0 | 7-58
  isOfAge.js                  |     100 |      100 |     100 |     100 |
  localStoreGet.js            |     100 |      100 |     100 |     100 |
  localStorePut.js            |     100 |      100 |     100 |     100 |
  registerEmailProfile.js     |       0 |      100 |       0 |       0 | 10-49
  registerGoogleProfile.js    |       0 |      100 |       0 |       0 | 8-45
  updateProfile.js            |       0 |      100 |       0 |       0 | 5-18
  updateUserData.js           |       0 |      100 |       0 |       0 | 5-7
------------------------------|---------|----------|---------|---------|-----------------------
Jest: "global" coverage threshold for statements (50%) not met: 26.14%
Jest: "global" coverage threshold for branches (20%) not met: 16.67%
Jest: "global" coverage threshold for lines (50%) not met: 26.49%
Jest: "global" coverage threshold for functions (30%) not met: 14.63%

Test Suites: 6 passed, 6 total
Tests:       36 passed, 36 total
Snapshots:   0 total
Time:        7.587 s
Ran all test suites.
```

The unit tests have been restructured into a set of suites, to better manage the increasing size of the collection. These unit testing suites each address a different aspect of the application. In considering testing in this way, we have been able to identify a more complete set of test surfaces for our application.

The degree of coverage attained is significantly impeded by the close coupling of the current high-level component set with the Google Firebase and Firestore APIs, and their associated component modules. Due to security-related limitations, traditional unit testing frameworks are not compatible with elements of our application which are composed from these components.

Testing Software and Related References

jest	https://jestjs.io/
jest-cucumber	https://github.com/bencompton/jest-cucumber
React	https://reactjs.org/
babel	https://babeljs.io/
JavaScript	https://developer.mozilla.org/en-US/docs/Web/JavaScript
Node.js	https://nodejs.org/en/
Yarn	https://yarnpkg.com/