Student Lap Tracker

Test Plan

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# ABSTRACT

This document describes the techniques, tools, and reasoning behind testing the Lap Tracker application.

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# INTRODUCTION

This document describes the techniques, tools, and reasoning behind testing the Lap Tracker application. The nature of a client-server MVC model is that all functionality is implemented on the server and exposed through a thin layer on the client. Because of this, the test plan is composed of two major parts, first are integration tests which are carried out entirely from the client side. These are meant to test the system as a whole and are meant to know nothing of the implementation. The integration tests also include a penetration-testing section to ensure no unauthorized data access or retrieval is possible.

The second major part is the set of unit tests for the internal system implementation. Whenever possible, these tests are still carried out as ‘black-box’ tests. However, some particular tests may need to use knowledge of the implementation in order to verify the application invariants are maintained. This is mostly due to the datastore work that happens internally.

# REQUIREMENTS/SPECIFICATIONS-BASED SYSTEM LEVEL TEST CASES

# Integration Tests

**Authentication**

Visit Homepage without Authentication

* Expected Output

Since the request handlers are decorated with either @login\_required or @admin\_required, the user will be redirected to a google account login page.

Visit Homepage with Authentication

* Expected Output
  + A list of links for each of the other pages: import, export, lap tracking, and milestone configuration.

Visit All Pages Similarly

Logout, repeat

**Import**

Upload Correct Workbook

* Expected Output

Upload Workbook with mismatched teacher names

* Expected Output

Upload Workbook with mismatched student names

* Expected Output

**Export**

Download All Students

* Expected Output

Download Single Student

* Expected Output:

**Tracking UI**

Scan Barcode

* Expected Output
  + After scanning a student’s ID barcode, a success message is displayed and the scan is added into the Recent Scan window.

Undo a repeated scan

* Expected Output
  + If a scan was unnecessary or repeated by accident, the user can remove the scan by clicking the delete button on the scan’s success message in the Recent Scan window

**Milestones**

Display Milestones

* Expected Output
  + A list/table of the milestones that are currently active.

Add Milestone

* Expected Output
  + A new row with the milestone specifications is added to the list/table. A success message appears briefly to let the user know the addition was successful.

Delete Milestone

* Expected Output
  + The specified milestone is removed from the list/table. A success message appears briefly to let the user know the removal was successful.

Modifying Milestone

* Expected Output
  + The milestone’s specifications are changed to the user’s new requirements. A success message appears briefly to let the user know the change was successful.

**Cron Emails**

Summary Email of Milestone Progress (Weekly Fridays after school)

* Expected Output
  + This will be called weekly after school and will send an email to the teacher containing a milestone progress report which may look like the following:

Weekly Milestone Progress Report:

Teacher Name Laps Laps to Go Until Next MileStone

Duke Meche 61 39

Vaishali Patel 74 26

...

Patrick Oyarzun 79 21

Trigger Milestone (Daily weekdays after school)

* Expected Output
  + In administrator console:

The Google App Engine administrator console provides a way to check the functionality of each cron job that is active. It provides us with the latest scheduled tasks, when they are scheduled to be executed, and whether or not the job was successful.

|  |  |
| --- | --- |
| **/crontask**  weekly milestone check | every friday 16:30 (US/Central)  2014/11/07 16:30:00 **on time Success** |

* Other:

1. If the milestones have not been reached by any student, nothing is done.
2. If the milestones have been reached, the teacher will be notified via email which teacher has passed the milestones and which class should be rewarded.

# Unit Tests for Internal Server Implementation

**Import**

Parse Correctly formatted Workbook

* Expected Output

The datastore contains a Teacher entity for each teacher in the spreadsheet.

The datastore contains a Student entity for each student in the spreadsheet.

Each student entity has the correct counts for track 1 and track 2.

Parse Workbook with mismatched teacher names

* Expected Output

Nothing is stored in the datastore.

An error message is returned naming the teacher which was not able to be matched.

Parse Workbook with mismatched student names

* Expected Output

Nothing is stored in the datastore.

An error message is returned naming the teacher which was not able to be matched.

**Export**

Download All Students

* Expected Output

A single Excel Workbook (.xlsx) is generated and it contains the entire contents of the database in the same format as the original uploaded spreadsheet.

Download Single Student

* Expected Output

The student object is returned singularly. This functionality does not generate an Excel Workbook as that would be superfluous for a single row.

**Tracking UI**

Scan Barcode

* Expected Output

Undo a repeated scan

* Expected Output

**Milestones**

Display Milestones

* Expected Output

Add Milestone

* Expected Output

Delete Milestone

* Expected Output

Modifying Milestone

* Expected Output

**Cron Emails**

Summary Email of Milestone Progress (Weekly Fridays after school)

* Expected Output
  + Success message in admin console under cron .jobs.

Trigger Milestone (Daily weekdays after school)

* Expected Output
  + Nothing if the milestones have not been met.
  + If the milestones are met, an email is sent to the teacher with the name(s) of the teacher(s) whose class had past the milestones.

# TRACEABILITY OF TEST CASES TO USE CASES

// explain why test cases ensure the spec is satisfied

Each of the original three use cases is covered by at least 1 integration test and several unit tests internally. This verifies that the spec is being followed. Additionally, the access control requirements are verified through some additional integration testing.

# TECHNIQUES FOR TEST GENERATION

// Specify which techniques are used for test generation

// Black box-based testing versus white-box based testing

// Specify which criteria are used for measuring the quality of your tests

// validation

# EVIDENCE THE TEST CASES, DOCUMENT HAVE BEEN PLACED UNDER CONFIGURATION MANAGEMENT

# REFERENCES