# BoilerCheck Team 13
## Incremental and Regression Testing

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**Classification of Components**

**Android Application GUI:**
- **Login Screen**
  - **Input: Email, Password, Login button, Sign Up button**
  - **Output: Descriptive error or navigate to Building screen**
  - **Parent Dependency: none**
  - **Child Dependency: Login action, Create User Screen**
- **Create User Screen**
  - **Input: Email, Password, Create User button**
  - **Output: Descriptive error or Login Screen**
  - **Parent Dependency: Login Screen**
  - **Child Dependency: Create User Action**
- **Display Buildings Screen**
  - **Input: Each building entry**
  - **Output: Check-in status**
  - **Parent Dependency: Login Action**
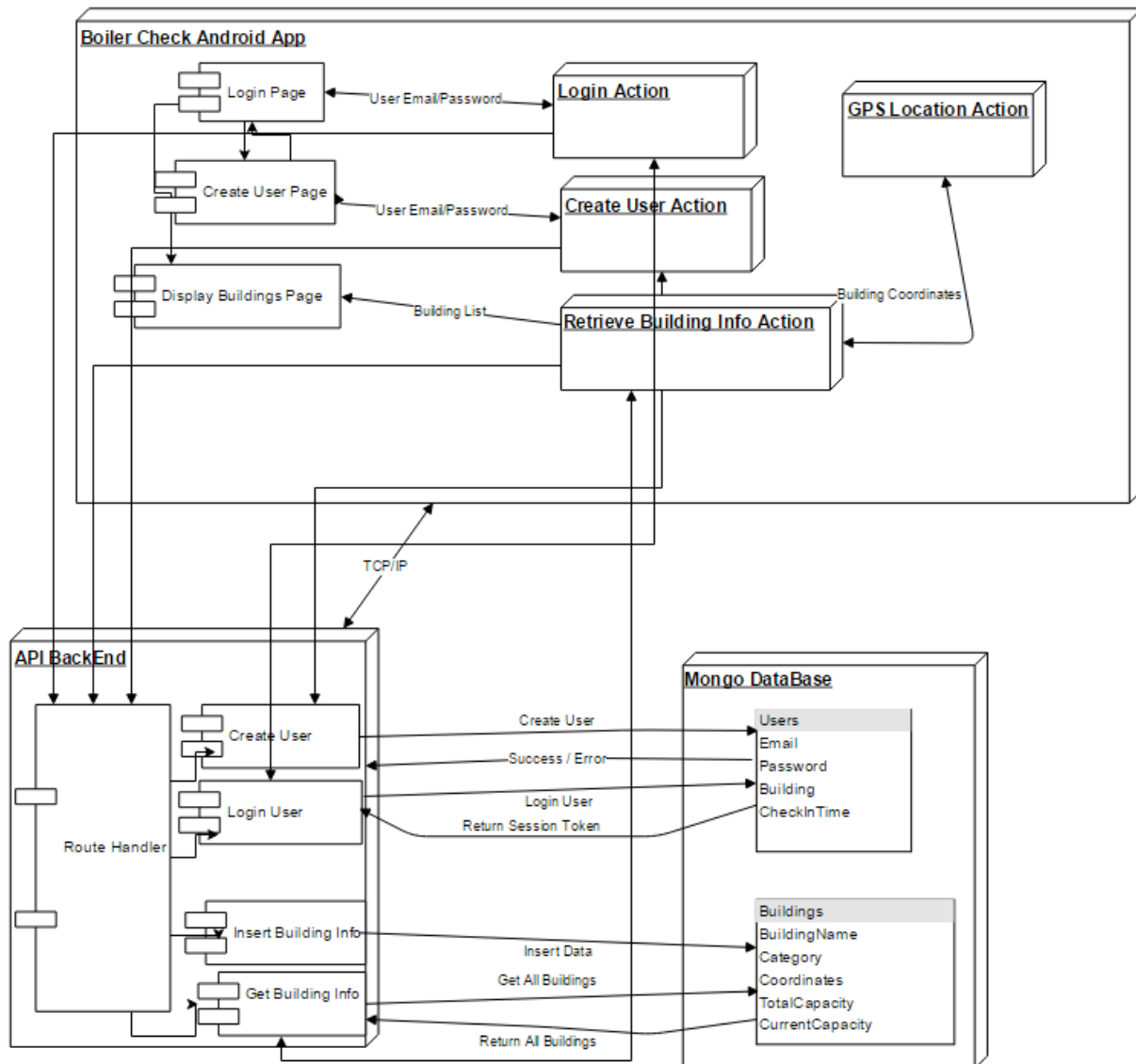  - **Child Dependency: Retrieve Building Info Action**

**Android Application Activities:**
- **Create User Action**
  - **Input: Email and Password**
  - **Output: Account Creation success or failure and reason**
  - **Parent Dependency: Create User Screen**
  - **Child Dependency: Login Screen**
- **Login Action**
  - **Input: Email and Password**
  - **Output: Login success or failure**
  - **Parent Dependency: None**

- ○ **Child Dependency: Display Buildings Screen**
- **GPS Location Action**
  - ○ **Input: None**
  - ○ **Output: GPS coordinates(longitude and latitude), distance between buildings**
  - ○ **Parent Dependency: Retrieve Building Info Action**
  - ○ **Child Dependency: None**
- **Retrieve Building Info Action**
  - ○ **Input: None**
  - ○ **Output: buildings from API BackEnd**
  - ○ **Parent Dependency: Display Buildings Screen**
  - ○ **Child Dependency: GPS Location Action**

**API BackEnd:**
- **Create User Handler**
  - ○ **Input: Email and Password**
  - ○ **Output: Creation success or failure to app**
  - ○ **Parent Dependency: Create User action**
  - ○ **Child Dependency: App User table**
- **Login User Handler**
  - ○ **Input: Email and Password**
  - ○ **Output: Login success or failure to app**
  - ○ **Parent Dependency: Login action**
  - ○ **Child Dependency: App User table**
- **Insert Building Data into Database**
  - ○ **Input: Building, Location, Category, Capacity**
  - ○ **Output: Building record insertion success or failure**
  - ○ **Parent Dependency: None**
  - ○ **Child Dependency: Building table**
- **Retrieve Building Data from Database**
  - ○ **Input: Building**
  - ○ **Output: Building record deletion success or failure**
  - ○ **Parent Dependency: None**
  - ○ **Child Dependency: Building table**

**Top-Down Incremental Testing:**

We chose this technique due to the fact that our program heavily relies on, and even does not function without, the parent component functioning. We see the login/create screens first, so they must properly function as GUI components before we can test the code within, which are the Login/Create User Action components. Once we know those components are sending the correct data, we can then move further down the chain to the API BackEnd Modules for handling the requests. The majority of the action flow occurs from top to bottom, so that is the method we chose for testing.

| Module | Android App:Login Screen |
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| Incremental Testing |
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| Defect # | Description | Severity | How To Correct |
|---|---|---|---|
| 1 | The login screen should have two different buttons | 3 | Create two separate buttons, one for logging in and one for creating account |
| 2 | Does not notify user of invalid password | 2 | Parse error code returned from server and display error in the password field area |

| Regression Testing |
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| Defect # | Description | Severity | How To Correct |
|---|---|---|---|
| 1 | Adding another button to the page causes the login button to be hidden when the keyboard pops up to enter text into the email/password fields | 1 | Relocate buttons or shrink them |
| 2 | After adding a custom background image to login screen, it is squeezed when keyboard is displayed | 3 | Modify the xml properties of the login layout to not squish the image |

| Module | Android App:Create User Screen |
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### Incremental Testing

| Defect # | Description | Severity | How To Correct |
|----------|-------------|----------|----------------|
| 1 | Does not distinguish errors between account already exists and non matching passwords | 2 | Display the correct error after parsing error response from the server |
| 1 | Upon successful creation, does not take user back to login screen | 1 | Go to the login screen activity when creation button is clicked and success is retrieved from server |

### Regression Testing

| Defect # | Description | Severity | How To Correct |
|----------|-------------|----------|----------------|
| 1 | Adding a new screen, create user, causes the background image to squeeze when keyboard is displayed | 3 | Modify the xml properties of the create user layout to not squish the image |

| Module | | Android App:Display Buildings Screen |
|---|---|---|

| **Incremental Testing** |
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| Defect # | Description | Severity | How To Correct |
|---|---|---|---|
| 1 | Being a different type of GUI component, does not look like the other screens in our app. | 3 | Add the top banner to make the screen coincide with the previous screens(login/creat e) |
| 1 | Button names are created from the building data, the data is not formatted in a similar matter | 3 | Check formatting for building information objects in map.json file |

| **Regression Testing** |
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| Defect # | Description | Severity | How To Correct |
|---|---|---|---|
|  |  |  |  |

| Module | Android App:Create User Action |
|---|---|

| Incremental Testing |
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| Defect # | Description | Severity | How To Correct |
|---|---|---|---|
| 1 | Creating user hangs for awhile no matter what the response is. | 2 | Remove thread.sleep in async call. |

| Regression Testing |
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| Defect # | Description | Severity | How To Correct |
|---|---|---|---|
| 1 | Removing thread.sleep throws other errors in async function. | 1 | Reduce thread.sleep time to 100 ms instead of the previous 2000ms |

| Module | Android App:Login User Action |
|---|---|

| Incremental Testing |
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| Defect # | Description | Severity | How To Correct |
|---|---|---|---|
| 1 | Creating user hangs for awhile no matter what the response is. | 2 | Remove thread.sleep in async call. |

## Regression Testing

| Defect # | Description | Severity | How To Correct |
|---|---|---|---|
| 1 | Removing thread.sleep throws other errors in async function. | 1 | Reduce thread.sleep time to 100 ms instead of the previous 2000ms |

| Module | | | Android App:GPS Location Action |
|---|---|---|---|

| | Incremental Testing | | |
|---|---|---|---|

| Defect # | Description | Severity | How To Correct |
|---|---|---|---|
| 1 | Wrong GPS coordinates were being acquired | 2 | Changed data type of latitude and longitude to double instead of int |
| 2 | OnConnected() function never got triggered when connect() was called | 2 | Called connect() function from BoilerCheck class instead of ListActivity class |
| 3 | Location update interval was set to 1 second causing extreme battery usage | 1 | Changed location update interval to 60 seconds |
| 4 | User can check into the closest building even if they aren't there | 1 | Check if the user is within 15 meters of the known GPS coordinates location |
| 5 | GPS keeps checking for location even after user is checked out and logged out | 1 | Call onPause() and onStop() functions when either the user is checked out and/or logged out |

| | Regression Testing | | |
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| Defect # | Description | Severity | How To Correct |
|---|---|---|---|
| 1 | Changed location interval was too | 2 | Decrease the changed location |

| Defect # | Description | Severity | How To Correct |
|---|---|---|---|
| | large and were getting delayed readings | | interval to 20 seconds |
| 2 | calculateDistance() function is still expecting int arguments for coordinates | 2 | Change the argument list for the function to take doubles for the coordinates |

| Module | Android App:Retrieve Building Info Action |
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| Incremental Testing |
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| Defect # | Description | Severity | How To Correct |
|---|---|---|---|
| 1 | Coordinates are not being stored correctly in the BoilerCheck Object. | 1 | Change type of Building.Coordinates to double instead of int |
| 2 | Building Objects are expecting Total and Current Capacity fields, but the JSON object provided does not have them. | 1 | Add the corresponding fields to the map.json objects |
| 3 | Sort function was not correctly sorting my desired criteria | 1 | Fixed quicksort algorithm to get correct sorting |

| Regression Testing | | | |
|---|---|---|---|
| **Defect #** | **Description** | **Severity** | **How To Correct** |
| 2 | Adding new fields to map.json file does not put them in the database | 1 | Add the fields to the mongoose buildingModel in buildingModel.js |


| Module | BackEnd: Login User |
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| Incremental Testing | | | |
|---|---|---|---|
| **Defect #** | **Description** | **Severity** | **How To Correct** |
| 1 | A User must login each time they start the app. | 3 | Use SharedPreference to store the username and password. |


| Regression Testing | | | |
|---|---|---|---|
| **Defect #** | **Description** | **Severity** | **How To Correct** |
| 1 | The user cannot login to another account after having logged in with one account. | 2 | Create a clearSharedPreferences to be called when the user hits a logout button. |

| Module | BackEnd: Create User |
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| Incremental Testing |
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| Defect # | Description | Severity | How To Correct |
|----------|-------------|----------|----------------|
| 1 | When account already exists, wrong error is thrown | 3 | Specify errors to specific situations |

| Regression Testing |
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| Defect # | Description | Severity | How To Correct |
|----------|-------------|----------|----------------|
| 1 | In throwing specific errors, the android app does not notify the user of the specific error | 3 | Map error codes returned to corresponding errors. (User already exists, invalid password, other error) |

| Module | BackEnd: Insert Building Data |
|---|---|

| Incremental Testing |
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| Defect # | Description | Severity | How To Correct |
|---|---|---|---|
| 1 | Each time server is started duplicate entries are entered | 3 | Remove previous entries before inserting on server start up |
| 2 | Coordinate data is not correct after insertion | 2 | Coordinates are of type double, change object to handle doubles instead of ints |

| Regression Testing |
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| Defect # | Description | Severity | How To Correct |
|---|---|---|---|
| 1 | Removing previous data entries causes loss of information in total checked in users | 1 | Add flag for toggling data insertion, if administrator wants to overwrite data, allow it |

| Module | BackEnd: Retrieve Building Data |
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### Incremental Testing

| Defect # | Description | Severity | How To Correct |
|----------|-------------|----------|----------------|
| 1 | App crashes trying to parse building info byte[] response | 1 | Convert the byte[] response to a UTF-8 string |

### Regression Testing

| Defect # | Description | Severity | How To Correct |
|----------|-------------|----------|----------------|
| 1 | After converting byte response to a UTF-8 string, the format is not a json object anymore | 1 | Need to manually format the string to a correct json object so it can be correctly parsed by the GSON library |