

Mobile Platform Development

Testing Document

**BSc Computer Games (Software Development)**

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GitHub Repository:

<https://github.com/dejwkubikson/MPD-Coursework>

Video:

<https://github.com/dejwkubikson/MPD-Coursework/blob/main/App%20video.wmv>

.apk File:

<https://github.com/dejwkubikson/MPD-Coursework/blob/main/app/build/outputs/apk/debug/app-debug.apk>

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# Gathering Data

## Testing

|  |  |  |
| --- | --- | --- |
| **Test Specification** | **Expected outcome** | **Actual outcome** |
| Using Log.e() to display <title> to check if all the earthquakes are pulled. | First earthquake: MULL,ARGYLL AND BUTE  Last earthquake:  BOHUNTINE,HIGHLAND | First earthquake: MULL,ARGYLL AND BUTE  Last earthquake:  BOHUNTINE,HIGHLAND |
| Checking if all earthquakes are pulled by comparing the earthquakes list size with actual <items> count in the XML file. | 27 earthquakes | 27 earthquakes |
| Checking if the correct data is assigned for the earthquakes. Comparing 2 random earthquakes from XML list with Log.e() inside the DataFeed class. | SOLWAY FIRTH:  Lat – 54.816 Long - -3.667  Mag – 0.3  Depth – 8km  Date – 03/03/2021  MULL,ARGYLL AND BUTE:  Lat – 56.434  Long - -6.090  Mag – 0.7  Depth – 2km  Date – 21/03/2021 | SOLWAY FIRTH:  Lat – 54.816 Long - -3.667  Mag – 0.3  Depth – 8km  Date – 03/03/2021  MULL,ARGYLL AND BUTE:  Lat – 56.434  Long - -6.090  Mag – 0.7  Depth – 2km  Date – 21/03/2021 |
| Checking if the lowest and highest magnitude is correctly determined. Finding the lowest and highest magnitude earthquakes and comparing with the DataFeed highestMag and lowestMag values. | highestMag – 2.3  lowestMag – 0.1 | highestMag – 2.3  lowestMag – 0.1 |

# List Screen

## Testing

|  |  |  |
| --- | --- | --- |
| **Test Specification** | **Expected outcome** | **Actual outcome** |
| Checking if the list is scrollable | List is scrollable | List is scrollable |
| Checking if the list displays all earthquakes correctly. | First earthquake: MULL,ARGYLL AND BUTE  Last earthquake:  BOHUNTINE,HIGHLAND  Total count:  27 earthquakes | First earthquake: MULL,ARGYLL AND BUTE  Last earthquake:  BOHUNTINE,HIGHLAND  Total count:  27 earthquakes |
| Checking if the colour coding is correct. Using Log.e() to determine the colour in hex format and the colour ratio that was calculated | North Atlantic Ocean (2.3 magnitude) to be red (#F00) with ratio 1.0f;  Hartsop, Cumbria (0.1 magnitude) to be green (#0F0) with ratio 0.0f;  Beattock, D and G (1.2) magnitude to be yellowish with ratio 0.5f; | North Atlantic Ocean (2.3 magnitude) is red (#F00) with ratio 1.0f;  Hartsop, Cumbria (0.1 magnitude) is green (#0F0) with ratio 0.0f;  Beattock, D and G (1.2) magnitude is yellowish with ratio 0.5f; |
| Checking if the items in the list are ‘expandable’ after clicking. | When clicking on an item it would expand to show its details. | Clicking on the item expanded the item and showed the details. |
| Checking if the View on map button moves to the map fragment and highlights the correct marker. | Clicking on “View on map” would change to the map screen, highlight the correct marker, and zoom into it. | Clicking on “View on map” changed to map screen and highlighted the correct marker. The test was performed on a couple of random earthquakes and the details (Name, magnitude, depth) were compared. The zoom effect was also applied correctly. |
| Checking if the items in the list are ‘closed’ after being expanded. | Item closing after being clicked | 1st attempt:  Item was not closing  2nd attempt (applied fix 1):  Item was correctly closing |
| Checking if the item’s details are correct. Comparing 2 random earthquakes from XML list with relevant earthquakes’ details on the app screen. | Conchra, Argyll and Bute  Lat 56.038, Long -5.174, Mag 1.2, Depth 11km, Date 24/03/2021  Central North Sea:  Lat 56.114, Long -2.288, Mag 1.8, Depth 4km, Date 08/03/2021 | Conchra, Argyll and Bute  Lat 56.038, Long -5.174, Mag 1.2, Depth 11km, Date 24/03/2021  Central North Sea:  Lat 56.114, Long -2.288, Mag 1.8, Depth 4km, Date 08/03/2021 |
| Screen rotation does not affect any functionality | Items are clickable (expand and hide), view on map button works, the list stays with the same colour coding and details. | 1st attempt:  Items are clickable (expand and hide), view on map button works, the list stays with the same colour coding and details. However, the list does not always display.  2nd attempt (fix 2 applied):  Full functionality no matter how many screen rotations. |

## Fixes

### Fix 1

When using the “View on Map” as a button the expanded list was not hiding. It could only be expanded. This button was changed to a TextView with an OnClickListener(). This allowed the item to be clicked once expanded and was correctly ‘hiding’.

### Fix 2

Very rarely, when rotating the device numerous times, the list did not show up. Using the notifyDataSetChangeD() on the adapter in the MainActivity’s onCreate method solved the issue.

# Map Screen

|  |  |  |
| --- | --- | --- |
| **Test Specification** | **Expected outcome** | **Actual outcome** |
| Displaying the earthquake markers | Similar amount of markers to total earthquakes. | Similar amount of marker to total earthquakes. Since being confident after previous tests, the markers did not need to be counted. |
| Marker locations accurate | Southern North Sea earthquake’s position is similar in the app’s map and in Google’s map (Latitude: 52.194, Longitude: 2.183). | Southern North Sea earthquake’s position is similar in the app’s map and in Google’s map. |
| Checking if the map’s zoom functionality is working as expected | Map zooming in and out | Map zooming in and out |
| Checking if the markers are selectable and show correct information | Markers are selectable and Highnam, Gloucestershire marker will show magnitude 0.8 and depth 11km in the snippet | Markers are selectable and Highnam, Gloucestershire marker shows magnitude 0.8 and depth 11km in the snippet |
| ‘Back’ button functional when selecting the “View on map” button on the List screen | Button visible when coming from the List screen. Button invisible when the user changed to List screen by clicking the tab rather than the button itself and when coming back to the map screen. | 1st attempt:  Button visible when coming from List screen. Issue with button still visible when going back to List screen and coming back to the map  2nd attempt (fix 1 applied):  Button visible when coming from the List screen. Button invisible when going back to List screen and coming back to the map. |
| Screen rotation does not affect any functionality | Markers are displayed correctly, are clickable, zoom functioning correctly, back button functional. | 1st attempt:  Markers are not displayed at all. Zoom and back button working as expected.  2nd attempt (applied fix 2):  Markers are displayed correctly, zoom and back button functioning. |

## Fixes

### Fix 1

In the MainActivity class, when the tab linking to the Map fragment is pressed, the callHideBtnOnMap() function calls the MapFragment’s hideBackButton() method if the btnEnabled Boolean variable is true. The hideBackButton() is basically finding the back button and sets its visibility to gone. The hideBackButton() method is called from MainActivity as placing the function call in the map’s getView() resulted in stack overflow. Calling it from the MainActivity was considered the best approach in that scenario.

### Fix 2

After further investigation to why the marks are vanishing when the screen is rotated, I have noticed that the markers are being set up before the data is restored from the saved instance in MainActivity. Since rotation of the screen ‘recreates’ the application and the earthquakes list empties, I have changed the markers to be set up in another, background thread using the TimerTask. The schedule task runs each second and checks whether the earthquakes list size is larger than zero. Once the earthquakes list is populated with the data from the saved instance, the markers are recreated and the timer is cancelled and purged.

# Statistics Screen

|  |  |  |
| --- | --- | --- |
| **Test Specification** | **Expected outcome** | **Actual outcome** |
| Checking if the specified date/s display/s correct data | The input date/s give/s correct results for most northerly / southerly etc. earthquakes which can be compared to data in the XML file for that date/s. | 1st attempt:  No data was displayed when using a single date filter.  2nd attempt (applied fix 1):  The input date gave correct results for most northerly / southerly etc. earthquakes which was compared to data in the XML file. |
| Testing the date range switch | When turning on the Date text changes to Date From and a Date To input is added. When turning off the Date From text changes to Date and Date To is removed. Correct date/s are used when clicking show button. | 1st attempt:  When an invalid Date To has been specified and date range turned off the program still tried to parse the Date To which produced an exception and was shown in the app.  2nd attempt (fix 2 applied):  Worked as intended. |
| Using Log.e() to check if the comparisons are correctly determined | When all earthquakes fitting the date range are listed, I am able to determine the most northerly / southerly etc. earthquakes and my result will match program’s outcome. | When all earthquakes fitting the date range were listed, I was able to determine the most northerly / southerly etc. earthquakes and my result were matching program’s outcome. |
| Screen rotation does not affect any functionality | Date/s display the same data, date switch functioning correctly. | 1st attempt:  The data vanishes from the screen. No matter what state the date switch is the Date To layout does not show up.  2nd attempt (fix 3):  The data is displayed correctly, the date switch functionality works as expected. |

## Fixes

### Fix 1

When the user enters the date, its time is set to 00:00. This resulted in not displaying any data as the comparison always resulted in earthquakes not fitting the specified date from (date from being equal to date to which was always 00:00). The earthquake’s time have been zeroed which resulted in finding matches for specified dates.

### Fix 2

Before parsing the Date To the program checks whether the date range switch is checked or not using an if statement.

### Fix 3

Four global variables have been created. Two Boolean (dataDisplayed, dateRange) and two Strings (strDateFrom, strDateTo). These are set depending on user’s actions, for example, if the date range switch is clicked, depending on the state it is changing to the dateRange variable is set to either true or false. When the user shows the data for a specific date / date range, the strDateFrom and strDateTo are populated with the date / dates the user input. These variables are saved in a Bundle using the onSaveInstanceState() method. When the screen is rotated, the onActivityCreated() method is called. The above function is overridden and reads the saved Bundle. Appropriate functionality is determined on the values of the data saved in the Bundle. For example, if the date range was saved as true, the date to layout is set to visible. If the data was displayed before the rotation the date from and date to Strings are parsed to Date and the GetStatistics() method is called which is responsible for displaying the data.