Mobile Platform Development Assignment

Session 2020/2021

MHI322959/MHI325105

First Diet Assignment

This assignment is worth 50% of the module assessment and is the only piece of course work that will be issued for the purposes of the first diet coursework component.

The purpose of this assignment is to test your design and programming ability in relation to the development of an application for a mobile computing device. The target device is a mobile computing device such as a mobile Smartphone running Android 6.0 or later.

You are reminded that this is a level 4 module and the assessment will reflect this fact. The marking scheme shown below indicates how the application will be assessed. At this stage you are expected to show a much greater level of understanding of the software lifecycle and the activities that you need to carry out as part of that lifecycle in producing your application.

Some form of iterative development is therefore most likely to be appropriate. However you final submission and reports should only cover the final iteration.

Scenario

The British Geological Survey records information about Earthquakes across the British Isles and beyond. (http://www.earthquakes.bgs.ac.uk/index.html) This information is available as an XML feed and provides information about earthquakes that have occurred over the last 50 days.

Your task is to "parse" the XML feed, store the data in an appropriate data structure and to provide some summary statistics in an aesthetically pleasing manner for the user of the application which will run on an Android Mobile Device.

The page showing the RSS feed is available at

http://quakes.bgs.ac.uk/feeds/MhSeismology.xml

You are required to develop an Android application which parses the RSS feed and displays the Seismic data in the information in the RSS feed in a meaningful way suitable for a mobile device. You will be required to report on some aspects of the application as part of your submission. There are a number of decisions that you will need to make regarding how this information is displayed.

This assignment will draw on your knowledge of object oriented programming, algorithm development, the good/appropriate use of data structures and HCI design principles. You will

need to parse the data and store the parsed data locally on the mobile device in such a way that the app can access it.

This is a programming assignment and you must use Android Studio and write your application in Java/XML. Under the current COVID restrictions you are likely to be using your own computer for practical application development. Version 4.1.2 is available for you to download (see https://developer.android.com/studio). Linking back to the British Geological website as part of the developed app is not permitted and will score 0 marks for any features implementing this approach. Producing functionality based on HTML in a web view in Android is not permitted either.

Application Specification

The Android Application that you are developing should display earthquake information for the last 50 days in some meaningful way that makes sense to the user of the app.

This should include:

- A list that the user can scroll through. The list should simply display the location and strength of the earthquake.
- Colour coding that displays the earthquakes from strongest to weakest
- A means of displaying more detailed information on a specific earthquake from the displayed list
- Functionality which allows the user to enter a specific date and date range. When this facility is executed the user should be presented with the following information for the day or period entered:
    - Most Northerly/Southerly/Westerly/Easterly earthquake.
    - Largest magnitude Earthquake.
    - Deepest and shallowest earthquake.
- The information that is being processed should update on a regular basis.
- Portrait and landscape layouts that make appropriate use of the space available in that layout
- A map view which allows the user to zoom in/out to view the location of a specific earthquake. The pins should be colour coded as per the strength of the earthquake.

You should be guided by the information that is available as part of the feed.

You will need to think through how to display all of this information on a small screen as is available on a mobile device.

There is scope for making good use of graphics, maps and text to convey information about the seismic activity. There is scope for having multiple views of the seismic activity. You may find it useful to view a number of web and mobile applications which display this type of information. You should design your interface to display appropriately in portrait and landscape mode. This means that you are expected to design screen layouts which make appropriate use of the screen space to display the required information when the screen is in a

particular orientation. This will require you to create different arrangements for landscape and portrait.

Marking

Marks are allocated as follows.

Category	Mark
Design and coding of the features outlined in the specification.	42%
Provision of a separate distinct landscape layout. This must be different from the arrangement used for the portrait view.	8%
Code for processing of the data from the XML Feed and storing the information in appropriate Java classes.	10%
The software Architecture that you utilised in order to build the Android application. There are a number of ways that you can create a data driven application in Android such as you are being asked to do here. These approaches range from the simple through clumsy/inefficient to sophisticated approaches. The marks here are intended to encourage you to explore the different approaches that you can use.	10%
Code for background Threads (different from the starter code provided) and an automatic updating of the data. You are required to improve on the threading approach that is used in the starter code provided. If you simply reuse the threading code provided you will receive 0 marks for this section.	10%
Documented Testing. This should be a table showing what tests you carried out, what the expected outcome was along with the actual outcome. The testing should demonstrate: that the data in the link is the data that is displayed in the various views provided by the app that the user can navigate around the app and select the required functionality as identified in the specification that the functionality required of the features asked for in the specification have been tested. Minimal implementations will not score full marks here.	15%
Video produced using screencast-o-matic	5%
Total	100%

Note that minimal or very simple implementations will not attract full marks in a particular section above.

You must hard code your matric number into every screen that you produce in the application. Every Java Class that you produce should have a header as a Java comment containing your name and matric number (student number) and every xml file should have a comment line containing your name and matric number. These are **STRICT** anti-plagiarism requirements.

Submission

The full assignment should be submitted no later than 12.00 noon on Friday the 9th of April 2021. You will be required to produce a video of your application running using Screencast-o-matic. The video should be in the region of 3-4 minutes.

All work must be carried out using Android Studio. The application must be written in Java with XML used to describe the interface as appropriate.

You are required to make 3 separate submissions. Separate areas on GCULearn will be set up to allow this.

Submission 1

- A Microsoft Word document (.doc or .docx) containing :
    - a link to your video (in a windows format .wmv or .mp4) stored on github (This must be at the start of the documentation)
    - a link to your android project stored on github
    - a link to the project .apk file stored on github
    - your written documented test strategy
    - This file MUST be named ***Surname_GivenName_StudentId***.docx

Submission 2

The Video of your application running in the emulator using Screen-Cast-O-Matic. This must run under windows. (.wmv or .mp4)
This file MUST be named ***Surname_GivenName_StudentId*_Video.wmv or *Surname_GivenName_StudentId*_Video.mp4**

Submission 3

You should create a folder using the following folder name

<Family Name>_<Given Name>_Student Id

e.g.

smith_jimmy_S123456

You should copy all of the files shown in the bullet points below into this folder.

A ZIP file (NOT a rar or 7z file or any other archive format and not password protected) containing your:

- android studio project
- .apk file
- Screencast-o-matic video

The zip file is a backup and to facilitate sending courseworks to the External examiners.

Marking

The module team marking the assignment will be looking for:

- Quality in the composition of the reports
- conformance to the specification
- appropriate use of Android graphical components
- appropriate screen displays in Portrait and Landscape layout which utilise the space appropriately
- appropriate use of layout managers
- appropriate use of Java classes to hold for example information about the earthquakes after it has been "parsed" from the XML data.
- appropriate use of menus
- appropriate use of Threads
- appropriate application of testing

A Specific number of marks are allocated for the use of threads to handle the loading and processing of the earthquake data from the RSS Feed. This code MUST be different from the supplied started code.

Seismic Data

The URL for the data feed is shown below.

- http://quakes.bgs.ac.uk/feeds/MhSeismology.xml

Sample data is shown in Appendix 1

Getting Started

You will be provided with some code that you can use in the creation of an Android Studio project as a starting point. The code that you will use in the Android Studio Project will allow you to access the web resource and displays the seismic data in a TextView. This project is designed as a starting points and "test bed" for your assignment. This will allow you to check that you can connect your Android application to the Seismic Data in the Emulator and/or from an Android phone.

You will have to "transform" the data in some way and then display it using appropriate Android graphical components. There are a number of possible ways to "parse" the XML data. You MUST use an approach based on the PullParser class available in Android. Other solutions will result in 0 marks for that component of the assignment.

Marks will be deducted for late submission in line with University Policy.

Note

You will need to add the following entries to the manifest file of your project

```
<application

        android:usesCleartextTraffic="true"


</application>

<uses-permission android:name="android.permission.INTERNET" />
```

The internet permission is needed to allow the application to access the WiFi connection of the emulator or actual mobile device and useCleartextTraffic is needed because the source is not secure (not https).

Appendix 1

This is sample XML data from the British Geological feed.

```
<rss xmlns:geo="http://www.w3.org/2003/01/geo/wgs84_pos#" xmlns:dc="http://
purl.org/dc/elements/1.1/" version="2.0">
<channel>
<title>Recent UK earthquakes</title>
<link>http://earthquakes.bgs.ac.uk/</link>
<description>Recent UK seismic events recorded by the BGS Seismology
team</description>
<language>en-gb</language>
<lastBuildDate>Thu, 21 Jan 2021 10:40:01</lastBuildDate>
<image>
<title>BGS Logo</title>
<url>http://www.bgs.ac.uk/images/logos/bgs_c_w_227x50.gif</url>
<link>http://earthquakes.bgs.ac.uk/</link>
</image>
<item>
```

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