Developing Mobile Application

Module Guide

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# Module overview

This module aims to cover the programming concepts for developing mobile Apps.  Practical development for resource constrained mobile devices present interesting programming challenges.  Lectures discuss these challenges by considering the design and the architecture of the Android framework. A structured set of lab exercises implement the concepts and “best practice” discussed in the lectures.  The lab exercises increase in complexity and form a portfolio of exercises.

More advanced topics follow the base MVC architecture and introduce lifecycle-aware components.  These topics are challenging and require proficiency in Object Orientation and Java.

The interim assessment is a lab test, the final assessment is a complete mobile App bringing together the concepts from the portfolio of lab exercises, and the advanced topics, please see the details in the assessment brief.

## Learning outcomes

On completion of this module, you should be able to:

1. Critically evaluate a range of mobile application development techniques.
2. Deal with complex software issues systematically and creatively and showing originality.
3. Be able to apply and critically evaluate programming approaches, which are appropriate to the production of applications for a mobile device.

## Delivery and feedback

The delivery is an hour lecture and a two-hour lab.  The IDE used is Android Studio, and Git provides version control to commit to a collaborative server.  The two submissions for the assessment, portfolio of lab exercises leading to a lab test and final mobile App have a presentation where you discuss your understanding of the code. The lab test is followed by feedback with code review during the lab sessions.

## Contact schedule

|  |  |  |
| --- | --- | --- |
| **Wk.** | **Lecture** | **Lab** |
| 1 | * MVC architectural pattern, Activity Class, Views, XML layouts | * First App, Android Studio, Git, Development lifecycle, Debug, Activity, Views |
| 2 | * Resource Constraint devices, Activity Manager, State transition | * First App, Activity LC, * Overriding state transition |
| 3 | * Development lifecycle, Debug, Bundle Objects, Serialising State | * Activity and Intent, * Rotation bug fix |
| 4 | * Event Listeners * Event handler | * Activity, Intent, Extras * Events Listeners and Event handlers |
| 5 | * Design consideration, Decoupling Intent | * Decoupling intent * Intent Extras |
| 6 | * Design consideration, Decoupling Fragments | * Decoupling Fragments, Fragment Bundle * Fragment transaction |
| 7 | * Lifecycle-aware components | * RecyclerView, Prototype “Todo” App |
| 8 | * Review | * Review |
| 9 | * **No Lecture** | * **Lab Test** |
| 10 | * Lifecycle-aware components | * Final App, Enhanced UID |
| 11 | * SQLite and Data persistence | * Final App, CRUD operations |
| 12 | * Additional topics: Review, MVP | * Final App |
| 13 14 | * Final Assignment submission, Final Presentation | |

## Assessment

Please refer to the separate assignment specification document for full details including what, when, and how you need to complete the assessment; the following is a brief overview.

The assessment is in two parts, namely:

1. Complete a portfolio of lab exercise; demonstrate your understanding of the code with a lab test.
2. Agree a set of use cases (e.g. CRUD operations for a Todo app) and design and implement an App and demonstrate your understanding of the code with a presentation, and follow up questions.

## Resources

### Books

|  |  |
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| Author/ Editor | Bill Phillips, Chris Stewart, and Kristin Marsicano |
| Title | Android Programming: The Big Nerd Ranch Guide |
| Edition | Latest |

|  |  |
| --- | --- |
| Author/ Editor | Murphy, Mark |
| Title | The Busy Coder’s Guide to Android Development |
| Edition | Latest Free Version released under Commonsware |
| Publisher | Commonsware (http://commonsware.com/Android/) |

### Websites

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| --- | --- |
| Description | Android Developer Docs |
| Creator | Google |
| URL | http://developer.android.com/index.html |

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| --- | --- |
| Description | Commonsware Books |
| Creator | Commonsware |
| URL | http://www.commonsware.com |

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| Description | Software Development Forum |
| Creator | StackOverflow |
| URL | http://www.stackoverflow.com |