



College of Engineering, Construction and Living Sciences  
Bachelor of Information Technology  
IN721: Mobile Application Development  
Level 7, Credits 15  
**Project**

## Assessment Overview

In this assessment, you will develop & publish a travelling application using **Kotlin** in **Android Studio** & **Google Play Store**. **Android** features such as **ViewModel**, **LiveData**, **Room Database** & **Google Map** were formally covered in the teaching sessions. The main purpose of this assessment is not just to build a mobile application, rather to demonstrate your ability to effectively learn intermediate/advanced **Android** & application development features independently. In addition, marks will be allocated for code elegance, documentation & **Git/GitHub** usage.

The travelling application will help you sound like a local abroad & help you adapt to a new culture. You will begin by selecting a **continent** & country tool. For example, if you were to travel to Spain, you would be provided with text translation & text to speech support, a selection of key Spanish phrases, an interactive quiz to test your knowledge of Spanish culture & a map containing locations of top-rated tourist Spanish attractions. A user of your travelling application must be able to select from at least two country tools per continent **excluding** Antarctica.

## Learning Outcomes

At the successful completion of this course, learners will be able to:

1. Implement & publish complete, non-trivial, industry-standard mobile applications following sound architectural & code-quality standards.
2. Identify relevant use cases for a mobile computing scenario & incorporate them into an effective user experience design.
3. Follow industry standard software engineering practice in the design of mobile applications.

## Assessment Table

Assessment Activity	Weighting	Learning Outcomes	Assessment Grading Scheme	Completion Requirements
Practical	20%	2, 3	CRA	Cumulative
Project	80%	1, 2, 3	CRA	Cumulative

## Conditions of Assessment

You will complete this assessment during your learner managed time, however, there will be availability during the teaching sessions to discuss the requirements & your progress of this assessment. This assessment will need to be completed by **Tuesday, 22 June 2021 at 5:00 PM**.

## Pass Criteria

This assessment is criterion-referenced (CRA) with a cumulative pass mark of **50%** over all assessments in **IN721: Mobile Application Development**.

## Authenticity

All parts of your submitted assessment must be completely your work & any references must be cited appropriately including, externally-sourced graphic elements. Provide your references in a **README.md** file. All media must be royalty free (or legally purchased) for educational use. Failure to do this will result in a mark of **zero** for this assessment.

## Policy on Submissions, Extensions, Resubmissions & Resits

The school's process concerning submissions, extensions, resubmissions & resits complies with **Otago Polytechnic** policies. Learners can view policies on the **Otago Polytechnic** website located at <https://www.op.ac.nz/about-us/governance-and-management/policies>.

## Submissions

You must submit all program files via **GitHub Classroom**. Here is the link to the repository you will use for your submission – [https://classroom.github.com/a/FWk\\_XkTA](https://classroom.github.com/a/FWk_XkTA). The latest program files in the **main** branch will be used to run your application. Late submissions will incur a **10% penalty per day**, rolling over at **5:00 PM**.

## Extensions

Familiarise yourself with the assessment due date. If you need an extension, contact the course lecturer before the due date. If you require more than a week's extension, a medical certificate or support letter from your manager may be needed.

## Resubmissions

Learners may be requested to resubmit an assessment following a rework of part/s of the original assessment. Resubmissions are to be completed within a negotiable short time frame & usually must be completed within the timing of the course to which the assessment relates. Resubmissions will be available to learners who have made a genuine attempt at the first assessment opportunity & achieved a **D grade (40-49%)**. The maximum grade awarded for resubmission will be **C-**.

## Resits

Resits & reassessments are not applicable in **IN721: Mobile Application Development**.

## Post-Assessment Evaluation

As part of this assessment, you will be required to organise a meeting with the course lecturer to discuss your feedback. The meeting will be conducted after you receive your assessment result. This post-assessment evaluation will **not** be graded.

## Instructions

You will need to submit an application & documentation that meet the following requirements:

### Functionality - Learning Outcomes 1, 2, 3 (40%)

- Application must open without file structure modification in **Android Studio**.
- Application must run without code modification on multiple mobile devices. The mobile devices used to test your application will be:
  - Pixel 2 - 5.0"
  - Pixel XL - 5.5"
  - Pixel 3a XL - 6.0"
- Application must run on **API 28: Android 9.0 (Pie)**.
- Text translation support. If a country is multilingual (use of more than one language), choose only one language. For example, Canada's main languages are English & French.
  - Use **Retrofit** & the **Yandex Translate API** to translate text from one language to another. To use the **Yandex Translate API**, you will need an API key. A key is available in the **Microsoft Teams** course channel, under the **Files** tab.
  - Display a custom **ProgressDialog** while the text is being translated.
  - Handle incorrectly formatted input fields. For example, an **EditText** is blank or empty.
  - **Resource:** <https://tech.yandex.com/translate>
- Text to speech support.
  - If a country is not supported, handle gracefully with a custom **Toast** message.
  - **Resource:** <https://developer.android.com/reference/kotlin/android/speech/tts/TextToSpeech>
- Selection of at least five key phrases. For example, "No worries, mate, she'll be right" is key phrase in Australia.
- An interactive quiz for each country.
  - Quiz data must be fetched from a **Spring Boot REST API** using **Retrofit**.
  - Quiz topics may include animals, culture, food, drink, geography & sport.
  - Each quiz must have at least five questions.
  - Questions are multi-choice & true or false.
  - Multi-choice questions must have four answers.
  - Each question must have an image.
  - Each question must be answered within a **30 second** time limit.
  - Display appropriate feedback for correct & incorrect answers with a custom **Toast** message. If a question is answered incorrectly, display the correct answer.
  - At the end of each quiz, store the highest score in a **Room Database** table.
  - For each quiz, display the highest score in a **TextView**.
  - **Resource:** <https://kotlinlang.org/docs/jvm-spring-boot-restful.html>
- Localization support for each country.
  - **Resource:** <https://developer.android.com/guide/topics/resources/localization>
- Application can be exited via a **DialogFragment**. The **DialogFragment** must prompt the user when the user double taps the mobile device's back button.

- Google Map displaying top-rated tourist attractions.
  - Top-rated tourist attraction data must be fetched from a **Spring Boot REST API** using **Retrofit**.
  - Each data object will be represented by a marker on a **Google Map**.
  - The marker's information window must display the attraction's name & coordinates (latitude & longitude).
  - **Resource:** <https://developers.google.com/maps/documentation/android-sdk/start>
- **Switch** which toggles between light & dark mode.
  - The state (true or false) value of the **Switch** must be stored in **SharedPreferences**.
  - The mode will be based off the state value of the **Switch**. For example, true equals dark mode & false equals light mode.
  - **Resource:** <https://developer.android.com/guide/topics/ui/look-and-feel/darktheme>
- Splash screen with an **ImageView** & transition animation.
  - The transition animation must be a custom animation **XML** file.
  - **Resource:** <https://developer.android.com/guide/topics/resources/animation-resource>
- Adaptive launcher icon which displays a variety of shapes across different mobile devices.
  - **Resources:**
    - \* [https://developer.android.com/guide/practices/ui\\_guidelines/icon\\_design\\_adaptive](https://developer.android.com/guide/practices/ui_guidelines/icon_design_adaptive)
    - \* <https://romannurik.github.io/AndroidAssetStudio/icons-launcher.html>
- **BottomNavigationView** which navigates the user to the appropriate activities. For example, a menu icon for translation support, text to speech support, etc.
  - **Resource:** <https://developer.android.com/reference/com/google/android/material/bottomnavigation/BottomNavigationView>
- A clickable link to your application's privacy policy.
  - **Resource:** <https://play.google.com/about/developer-content-policy>
- Visually attractive UI with a coherent graphical theme & style using **Material Design**.
- Application is published to **Google Play Store**.
  - To published to **Google Play Store**, you will need a **Google Play Console** account. The account's credentials are available in the **Microsoft Teams** course channel, under the **Files** tab. The account will be available to all learners in the course. **Do not** disable any applications published on this account.
  - When you create your application, name the package appropriately. For example, **op.mobile.app.dev.<username>.travelling**. **Note:** replace **username** with your **Otago Polytechnic** username.
  - **Resources:**
    - \* <https://support.google.com/googleplay/android-developer/answer/113469?hl=en>
    - \* <https://developer.android.com/studio/publish/app-signing>
- Ability to download your application from **Google Play Store** on to multiple mobile devices. The mobile devices used to download your application will be:
  - Pixel 2 - 5.0"
  - Pixel XL - 5.5"
  - Pixel 3a XL - 6.0"
- At least **15** UI tests which verify that your application is functioning correctly.

## Code Elegance - Learning Outcomes 1, 3 (40%)

- **Kotlin & XML** files contain no magic numbers/strings. Store the values in the appropriate **XML** files. For example, numbers must be stored in an integer or dimension file & strings must be stored in a string file.
- Use of intermediate variables. No method calls as arguments.
- Idiomatic use of control flow, data structures & other in-built functions.
- Code adheres to various object-oriented design principles. For example, **DRY** & **SOLID**.
- Efficient algorithmic approach.

## Documentation & Git/GitHub Usage - Learning Outcomes 2, 3 (20%)

- Provide the following in your repository **README** **Markdown** file:
  - Privacy policy which discloses user information collected by your application. For example, does this application require storage access or internet?
  - Sketched wireframes of your application. The wireframes must be sketched/designed using online software. This must be completed before you start coding.
    - \* **Resource:** <https://moqups.com>
  - Step-by-step user guide detailing each screen. The user guide must contain a screenshot of each screen in your application.
  - Commented code is documented using **KDoc** & generated to **Markdown** using **Dokka**.
  - **Resources:**
    - \* <https://kotlinlang.org/docs/reference/kotlin-doc.html>
    - \* <https://github.com/Kotlin/dokka>
  - **Spring Boot REST API** endpoints for quiz & tourist-attraction features.
  - URL to your application on **Google Play Store**.
- Continuous integration using **GitHub Actions**.
  - **YAML** file must be configured for UI tests and generating an APK.
  - **Resource:** <https://wkrzywiec.medium.com/github-actions-for-android-first-approach-f616c24aa0f9>
- At least **10** feature branches excluding the **main** branch.
  - Your branches must be prefix with **feature**, for example, **feature-<name of functional requirement>**.
  - Code in the branch must relate to the **feature**.
  - Once you have completed a **feature**, create a pull request & assign the **GitHub** user **grayson-orr** to a reviewer. **Do not** merge your own pull request.
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- Commit messages must reflect the context of each functional requirement change. **Do not** rewrite your **Git** history. It is important that the course lecturer can see how you worked on your assessment over time.
  - **Resource:** <https://www.freecodecamp.org/news/writing-good-commit-messages-a-practical-guide>