



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 Spanish tourist 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 **Wednesday, 23 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 URL 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**.

## 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 **Toast**.
  - **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 **JSON** file in the **raw** resource directory.
  - 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 **Toast**. 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 **JSON** file in the **raw** resource directory.
  - 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>
- 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://developer.android.com/studio/publish/app-signing>
    - \* <https://support.google.com/googleplay/android-developer/answer/113469?hl=en>
- 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 (45%)

- **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 **DRY**, **KISS** & **SOLID** design principles.
  - **Resources:**
    - \* <https://dzone.com/articles/software-design-principles-dry-and-kiss>
    - \* [https://digitalocean.com/community/conceptual\\_articles/s-o-l-i-d-the-first-five-principles-of-object-oriented-design](https://digitalocean.com/community/conceptual_articles/s-o-l-i-d-the-first-five-principles-of-object-oriented-design)
- Efficient algorithmic approach.
- **Kotlin & XML** files are code formatted.

## Documentation & Git/GitHub Usage - Learning Outcomes 2, 3 (15%)

- Provide the following in your repository **README.md** file:
  - URL to your application's privacy policy.
    - \* **Resource:** <https://play.google.com/about/developer-content-policy>
  - Sketched wireframes of your application. The wireframes must be sketched/designed using online software.
    - \* **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://github.com/Kotlin/dokka>
      - <https://kotlinlang.org/docs/reference/kotlin-doc.html>
  - 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.
  - **Resources:**
    - \* <https://atlassian.com/continuous-delivery/continuous-integration>
    - \* <https://docs.github.com/en/actions>
    - \* <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.
- 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://freecodecamp.org/news/writing-good-commit-messages-a-practical-guide>

# Project Assessment Rubric

	10-9	8-7	6-5	4-0
Functionality	<p>The application contains comprehensive &amp; robust evidence on the following:</p> <ul style="list-style-type: none"> <li>• opens &amp; runs on API 28: Android 9.0 (Pie) without file structure &amp; code modification.</li> <li>• text translation, text to speech &amp; localization support.</li> <li>• selection of key phrases.</li> <li>• interactive quiz.</li> <li>• exit application via dialog.</li> <li>• Google map displaying markers.</li> <li>• light &amp; dark mode.</li> <li>• splash screen with image &amp; transition animation.</li> <li>• adaptive launcher icon.</li> <li>• navigation to activities.</li> <li>• visually attractive UI.</li> <li>• published to &amp; downloadable from Google Play Store.</li> <li>• UI tests verify correctness.</li> </ul>	<p>The application contains clear &amp; detailed evidence of functionality on the following:</p> <ul style="list-style-type: none"> <li>• opens &amp; runs on API 28: Android 9.0 (Pie) without file structure &amp; code modification.</li> <li>• text translation, text to speech &amp; localization support.</li> <li>• selection of key phrases.</li> <li>• interactive quiz.</li> <li>• exit application via dialog.</li> <li>• Google map displaying markers.</li> <li>• light &amp; dark mode.</li> <li>• splash screen with image &amp; transition animation.</li> <li>• adaptive launcher icon.</li> <li>• navigation to activities.</li> <li>• visually attractive UI</li> <li>• published to &amp; downloadable from Google Play Store.</li> <li>• UI tests verify correctness.</li> </ul>	<p>The application contains evidence on the following:</p> <ul style="list-style-type: none"> <li>• opens &amp; runs on API 28: Android 9.0 (Pie) without file structure &amp; code modification.</li> <li>• text translation, text to speech &amp; localization support.</li> <li>• selection of key phrases.</li> <li>• interactive quiz.</li> <li>• exit application via dialog.</li> <li>• Google map displaying markers.</li> <li>• light &amp; dark mode.</li> <li>• splash screen with image &amp; transition animation.</li> <li>• adaptive launcher icon.</li> <li>• navigation to activities.</li> <li>• visually attractive UI</li> <li>• published to &amp; downloadable from Google Play Store.</li> <li>• UI tests verify correctness.</li> </ul>	<p>The application does not, or does not fully contain evidence on the following:</p> <ul style="list-style-type: none"> <li>• opens &amp; runs on API 28: Android 9.0 (Pie) without file structure &amp; code modification.</li> <li>• text translation, text to speech &amp; localization support.</li> <li>• selection of key phrases.</li> <li>• interactive quiz.</li> <li>• exit application via dialog.</li> <li>• Google map displaying markers.</li> <li>• light &amp; dark mode.</li> <li>• splash screen with image &amp; transition animation.</li> <li>• adaptive launcher icon.</li> <li>• navigation to activities.</li> <li>• visually attractive UI</li> <li>• published to &amp; downloadable from Google Play Store.</li> <li>• UI tests verify correctness.</li> </ul>

Code Elegance	<p>Kotlin &amp; XML files thoroughly contain no magic numbers/strings &amp; are stored in their appropriate XML files.</p> <p>Application code thoroughly demonstrates code elegance on the following:</p> <ul style="list-style-type: none"> <li>• correct use of intermediate variables, i.e., no method calls as arguments.</li> <li>• idiomatic use of control flow, data structures &amp; other in-built functions.</li> <li>• sufficient modularity, i.e., code adheres to DRY, KISS &amp; SOLID.</li> <li>• adhere to an OO architecture, i.e., classes, functions, concise naming &amp; functions assigned to the correct classes.</li> <li>• efficient algorithmic approach.</li> <li>• code formatted Kotlin &amp; XML files.</li> </ul>	<p>Kotlin &amp; XML files clearly contain no magic numbers/strings &amp; are stored in their appropriate XML files.</p> <p>Application code clearly demonstrates code elegance on the following:</p> <ul style="list-style-type: none"> <li>• correct use of intermediate variables, i.e., no method calls as arguments.</li> <li>• idiomatic use of control flow, data structures &amp; other in-built functions.</li> <li>• sufficient modularity, i.e., code adheres to DRY, KISS &amp; SOLID.</li> <li>• adhere to an OO architecture, i.e., classes, functions, concise naming &amp; functions assigned to the correct classes.</li> <li>• efficient algorithmic approach.</li> <li>• code formatted Kotlin &amp; XML files.</li> </ul>	<p>Kotlin &amp; XML files contain no magic numbers/strings &amp; are stored in their appropriate XML files.</p> <p>Application code demonstrates code elegance on the following:</p> <ul style="list-style-type: none"> <li>• correct use of intermediate variables, i.e., no method calls as arguments.</li> <li>• idiomatic use of control flow, data structures &amp; other in-built functions.</li> <li>• sufficient modularity, i.e., code adheres to DRY, KISS &amp; SOLID.</li> <li>• adhere to an OO architecture, i.e., classes, functions, concise naming &amp; functions assigned to the correct classes.</li> <li>• efficient algorithmic approach.</li> <li>• code formatted Kotlin &amp; XML files.</li> </ul>	<p>Kotlin &amp; XML files contain frequent magic numbers/strings &amp; are not or are not fully stored in their appropriate XML files.</p> <p>Application code does not or does not fully demonstrate code elegance on the following:</p> <ul style="list-style-type: none"> <li>• correct use of intermediate variables, i.e., no method calls as arguments.</li> <li>• idiomatic use of control flow, data structures &amp; other in-built functions.</li> <li>• sufficient modularity, i.e., code adheres to DRY, KISS &amp; SOLID.</li> <li>• adhere to an OO architecture, i.e., classes, functions, concise naming &amp; functions assigned to the correct classes.</li> <li>• efficient algorithmic approach.</li> <li>• code formatted Kotlin &amp; XML files.</li> </ul>
---------------	--	--	--	---



Documentation & Git Usage	README file contains comprehensive evidence of:	README file contains clear evidence of:	README file contains evidence of:	README file does not or does not fully contain evidence of:
	<ul style="list-style-type: none"> <li>URL to application's privacy policy.</li> <li>wireframes sketched of the application.</li> <li>step-by-step user guide.</li> <li>code commented with KDoc &amp; generated with Dokka.</li> <li>URL to application on Google Play Store.</li> </ul> <p>Git branches comprehensively named with convention &amp; contain code relating to the feature.</p> <p>Git commit messages comprehensively formatted &amp; reflect the feature changes in concise detail.</p> <p>Continuous integration using GitHub Actions comprehensively setup.</p>	<ul style="list-style-type: none"> <li>URL to application's privacy policy.</li> <li>wireframes sketched of the application.</li> <li>step-by-step user guide.</li> <li>code commented with KDoc &amp; generated with Dokka.</li> <li>URL to application on Google Play Store.</li> </ul> <p>Git branches clearly named with convention &amp; contain code relating to the feature.</p> <p>Git commit messages clearly formatted &amp; reflect the feature changes in substantial detail.</p> <p>Continuous integration using GitHub Actions clearly setup.</p>	<ul style="list-style-type: none"> <li>URL to application's privacy policy.</li> <li>wireframes sketched of the application.</li> <li>step-by-step user guide.</li> <li>code commented with KDoc &amp; generated with Dokka.</li> <li>URL to application on Google Play Store.</li> </ul> <p>Git branches named with convention &amp; contain code relating to the feature.</p> <p>Git commit messages formatted &amp; reflect the feature changes in detail.</p> <p>Continuous integration using GitHub Actions setup.</p>	<ul style="list-style-type: none"> <li>privacy policy discloses user information collected.</li> <li>wireframes sketched of the application.</li> <li>step-by-step user guide.</li> <li>code commented with KDoc &amp; generated with Dokka.</li> <li>URL to application on Google Play Store.</li> </ul> <p>Git branches are not or are not fully named with convention &amp; do not or do not fully contain code relating to the feature.</p> <p>Git commit messages do not or do not fully formatted &amp; reflect the feature changes.</p> <p>Continuous integration using GitHub Actions not or not fully setup.</p>

# Project Marking Cover Sheet

Name:

Date:

Learner ID:

Assessor's Name:

Assessor's Signature:

Criteria	Out Of	Weighting	Final Result
Functionality	10	40	
Code Elegance	10	45	
Documentation & Git/GitHub Usage	10	15	
Final Result			/100
This assessment is worth 80% of the final mark for the Mobile Application Development course.			

Feedback: