Government of Western Australia
North Metropolitan TAFE

Assessment Task

Qualification national code and title	ICT50220 Diploma of Information Technology (Advanced Programming)
Unit/s national code/s and title/s	ICTPRG… …

Assessment type (☑)

☐ Questioning (Oral/Written)

☒ Practical Demonstration

☐ 3rd Party Report

☐ Other – Project/Portfolio *(please specify below)*

Version Details

V	Date	Editor	Summary
1	2024-07-11	A Gould	New version using updated template

Note: On the following page is a table of contents to assist you to navigate this document. You may CTRL + CLICK on an entry to jump to that location.

Parts of the Document

Assessment Instructions   These are the instructions that must be followed whilst completing the assessment.

Assessment Instrument   This is where you may be asked questions, required to supply evidence of your work and other specific information as required.

Appendices   Further required information that are required guidelines, but are better placed external to the work to be performed.

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Assessment Resources

College to Provide

- Web App Development Environment:
    - Web server
    - PHP 8.2+ interpreter plus composer
    - Database server (MySQL, SQLite, MariaDB, or similar)
- Internet Access
- IDE or editor for developing PHP applications
  (only PhpStorm is supported by the college)
- Access to Office 365 & Microsoft Word

Student to Provide

N/A

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Assessment Instructions

- Please read these instructions carefully.
- Follow each step as provided.
- Questions will be asked in a separate section of this document, with space provided for your answers.
- Information in the appendices **MUST** be applied to your assessment submissions.

Date Due

- 5PM on day of Session 7

Scenario

You are employed as a junior Web Application Developer for RIoT Systems (*Robotics & Internet of Things*), a Perth based educational and development company who specialise in IoT, Robotics and Web Application systems.

You have been tasked with the implementation of a basic REST API to provide the start of a solution for an opportunity for the company.

You are provided with a set of steps to accomplish this (this document).

At any stage during this assignment item, you may consult the stakeholder(s) or their representative(s).

Opportunity Outline

The company has identified that there is a lack of a suitable Web application and API to provide students and recent graduates (1-2 years after graduation) with a place to find opportunities for employment.

The system is targeting the need for employment, especially as internships but also as part time work whilst still studying, or full-time and contract work when graduated.

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Required Features

> *The features shown below are given in more details in the steps within the project, this is for outline and to assist in understanding the context of the opportunity outlined above.*

You are required to develop the following initial feature sets:

- Companies
- Positions

There are pre-requisite features that include, but may not be limited to:

- Regions
- Sub-Regions
- Countries
- Cities

More details will be given in the following sections and may include additional work to previously implemented features.

General Guidance

In the Positions and Companies features, you may use foreign keys to link to the relevant models such as country and city.

You may alternatively copy the required full text data from the relevant model into the Positions and Companies but be aware that any changes to the city or country would then not be updated in the relevant models.

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Development, Testing & Documentation

Development of the Web Application must include:

- PEST (feature) tests **must** be written for each feature and its components
- All data **must** be validated
- Correct HTTP Responses **will** be given (200 OK, 201 Created, 404 Not Found, 403 Forbidden, etc)
- A standardised JSON response structure **will** be used:

```
{
  "success": true|false,
  "message": "Some form of message",
  "data": {
    …
  }
}
```

- The response structure may be amended to include an "errors" field that contains an array of errors.

Information Referencing

This is COMPULSORY for all assessments and covers resources that include but is not limited to:

- The Internet;
- Books;
- Video;
- Code;
- AI Use; and
- Audio.

More details on referencing requirements may be found in *Appendix C: Referencing*.

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Important: Before Commencing

It is very important that you familiarise yourself with the content of this assessment by reading the whole document *at least once* before commencing.

As you progress through the steps contained in this assessment document, any questions relating to a step, or required evidence will be added into the *Assessment Instrument* section.

Step 1: Analysis and Project Initialisation

Before commencing you will need to do the following:

- Create a new empty private GitHub (or equivalent) repository
    - Ensure that the repository does **NOT** have a ReadMe.md, .gitignore, License or any other files.
    - Further details are shown in Appendix F: Git & GitHub
- Create a new GitHub Project
    - The style will be a basic "Kanban".
- Each feature and sub-feature should be added as issues (see Appendix F: Git & GitHub).
- Create a new Laravel application
- Ensure the application is named the same as your repository name.
- Update the default .gitignore as required to make sure that backup files, IDE files and other items are not included in the repository.
- Duplicate the .env file and name the copy .env.dev, add this to your version control.

Before starting code, you should plan the required steps from this project as GitHub (or equivalent) issues:

- Create a Kanban board to track your work.
- Create an automation that adds new issues to the project.
- Plan the portfolio tasks by adding GitHub issues.
- Move all tasks to the To Do column.
- Determine the next three tasks to be completed and move into the Up Next column.

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Step 2: Companies Feature

The companies feature will allow a client to administer companies.

This includes the ability to:

- browse
- read
- add
- edit
- "soft delete"
- "soft undo"

At this time, companies may be edited, added and deleted by any user.

The company model will have the following fields:

- (company) name
- city
- state
- country
- logo (image)

Use the country, state, city and company name as a combined unique key so that a company with multiple locations can advertise a position for a particular city.

Key relationships include, but may not be limited to:

- A company may have one or more positions related to it.

Remember that soft deletes will be required.

Roles and permissions are ***not*** to be implemented for this step. You do not need to create an API for Roles and Permissions as these are tied into the security of the application and the API.

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Step 3: Positions Feature

The positions feature will allow a client to manage positions. This includes:

- browse
- read
- add
- edit
- "soft delete"
- "soft undo"

At this time, positions may be edited, added and deleted by any user.

The positions model will include, but may not be limited to the following fields:

- advertising start date
- advertising end date
- position title
- position description
- position keywords
- minimum salary
- maximum salary
- salary currency (default AUD)
- company (including city, state and country)
- benefits
- requirements
- position type (permanent, contract, part-time, casual)

Key relationships include, but may not be limited to:

- A position belongs to a company.
- A position belongs to a user (client).

Remember that soft deletes will be required.

Roles and permissions are **not** to be implemented for this step. You do not need to create an API for Roles and Permissions as these are tied into the security of the application and the API.

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Step 4: Users Feature

The users feature allows for users of the system to be managed.

This includes:

- browse
- read
- add
- edit
- "soft delete"
- "soft undo"

The users model should include:

- user nickname
- given name
- family name
- email address
- company
- user type (client, staff, or applicant)
- status (active, unconfirmed, suspended, banned, unknown, suspended)

During "online" registration the client would be asked if they will be a client (posting positions) or an applicant (looking for work).

A user cannot be both client and applicant.

Key relationships include, but may not be limited to:

- A client may have zero of more positions advertised.
- A client belongs to one company
- An applicant belongs to no company
- An applicant may have zero or more applications (NOT IMPLEMENTED)

Remember that soft deletes will be required.

Roles and permissions are ***not*** to be implemented for this step. You do not need to create an API for Roles and Permissions as these are tied into the security of the application and the API.

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Step 5: Review Code

Make sure you complete each of the following at this point, and add evidence in the *Answer 5 Code Review* section within this document:

- Pass all tests on Company feature
- Pass all tests for the Position feature
- Pass all tests for the User feature

Perform an xDebug Code Coverage report.

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Step 6: Authentication & Access Restriction

After completing the steps 1 – 5, the next step is to implement Authentication using Sanctum requests to your API.

Testing must be completed and documented in SECTION_REFERENCE_HERE, and the ability to demonstrate your working code if required by your company representative (lecturer).

The following details are important and must be tested and be able to be demonstrated:

- At no point should we see any HTML login page, or errors, or similar.
- All responses are in JSON format, and correctly structured as per the previous stage of the portfolio.

Users Feature Specific

- The users should include a field that indicates if the user is a client, staff, or applicant.
- During "online" registration the end user will submit the required user type:
- - client (posting positions) or
- - applicant (looking for work).
- A user cannot be both client and applicant.

Once Register, Login and Logout have been completed then continue with the next phase.

Company Feature Specific

- Protect all routes for companies so an end user must be logged in via the API.

Details continue next page…

Position Feature Specific

- Protect all routes except the index (browse) route so that end users must be logged in via the client.
- The index (browse) route should only return *six* (6) positions when the user is not logged in

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- The index (browse) route should return all positions when logged in.
- The logged-in index (browse) will paginate results (pages of 3, 6, or 9 for testing).

Step 7: Authorisation - Companies

The companies feature will allow a client to add a company, using the country, state, city and company name as a combined unique key so that a company with multiple locations can advertise a position for a particular city.

The table below shows how this feature maps to permissions to complete the tasks.

User type	Browse (all)	Read (one)	Edit	Add	Delete	Search	Notes
Unregistered	No	No	No	No	No	No	
Applicant	No	No	No	No	No	No	
Client	All	All	Only Own	Only Own	Only Own	All	
Staff	All	All	All	All	All	All	Soft Delete: Undo all, Undo one, Destroy all, Destroy one
Administrator	All	All	All	All	All	All	Soft Delete: Undo all, Undo one, Destroy all, Destroy one
Super-User	All	All	All	All	All	All	Full access to all operations

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Step 8: Authorisation - Positions

The positions feature will allow a client to manage positions, whilst an applicant will be able to apply for a position.

There are key items of data for the position that include, but may not be limited to, the advertising start date, advertising end date, as well as the position, a description, minimum and maximum salary, and other details.

The table below shows how this feature maps to permissions to complete the tasks.

User type	Browse (all)	Read (one)	Edit	Add	Delete	Search	Notes
Unregistered	Limited Qty: 6 Random	No	No	No	No	No	Must register to be able to view details. User must be registered to access more than "six" positions in browse.
Applicant	Yes	Yes	No	No	No	Yes	
Client	All	All	Only Own	Only Own	Only Own	All	Soft Delete: May undo own deletions
Staff	All	All	All	All	All	All	Soft Delete: Undo all, Undo one, Destroy all, Destroy one
Administrator	All	All	All	All	All	All	Soft Delete: Undo all, Undo one, Destroy all, Destroy one
Super-User	All	All	All	All	All	All	Full access to all feature actions

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Step 9: Authorisation - Users

User operations are limited within the API.

The table below shows how this feature maps to permissions to complete the tasks.

User type	Browse (all)	Read (one)	Edit	Add	Delete	Search	Notes
Unregistered	No	No	No	No	No	No	Must register to work on account
Applicant	No	Only Own	Only Own	No	Only Own	No	Soft deletes are used, no access to account recovery
Client	No	Only Own	Only Own	No	Only Own	No	Soft deletes are used, no access to account recovery
Staff	All	All	All	All	All	All	Soft Delete: Undo one Cannot delete themselves, Administrators or Super-users
Administrator	All	All	All	All	All	All	Soft Delete: Undo all, Undo one, Destroy one Cannot delete themselves or Super-users
Super-User	All	All	All	All	All	All	Soft Delete: Undo all, Undo one, Destroy one, Destroy all Cannot delete themselves or Super-users

Not to be Implemented: Information Only

It is possible to define more restrictive access to features. The table below shows a possible set of permissions that could be used for more defined (granular) access to the features of user administration.

User type	Browse (all)	Read (one)	Edit	Add	Delete	Search	Notes

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Unregistered	No	No	No	No	No	No	Must register to work on account
Applicant	No	Only Own	Only Own	No	Only Own	No	Soft deletes are used, no access to account recovery
Client	No	Only Own	Only Own	No	Only Own	No	Soft deletes are used, no access to account recovery
Staff	All	All	Only own Clients Applicants	Yes Limited Clients Applicants	Clients, Applicants *Cannot delete themselves, Administrators or Super-users*	All	Soft deletes are used, no access to account recovery.
Administrator	All	All	All	All	Clients, Applicants, Staff *Cannot delete themselves, Administrators or Super-users*	All	Soft deletes are used No access to account recovery.
Super-User	All	All	All	All	Any *Cannot delete themselves*	All	Soft deletes are used No access to account recovery.

Step 10: Verify

Before submission and the required demonstration, you should:

- Check that you have implemented the features as required
- Documented your code
- Run and passed your feature tests
- Documented your API
- Created a Postman project with the required collections for the features
- Tested the API via Postman

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Step 11: Book Demonstration

You will book a 30-minute meeting with the company representatives (the lecturer). During this meeting you will:

- Demonstrate features of the API
- Demonstrate the API documentation
- Answer questions about your implementation

A separate checklist will be used for this, and provided once your work is submitted.

The demonstration will be added as a separate assessment item for easier tracking and feedback.

Online students will book for a meeting via video where they will share their screen and demonstrate using the same checklist.

Step 12: Submission

Make sure you follow the details in *Appendix A: Assessment Submission* and ***Error! Reference source not found.*** when submitting your assessment.

For this assessment we require:

- This document with:
  o all questions answered,
  o all required screenshots, and
  o any code that has been requested to be inserted into the document.
- A compressed copy of the Project Code **WITHOUT** the node_modules and vendor folders.
- A copy of the video evidence recording.

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Assessment Instrument

When a step includes a question, you must attempt to answer it.

There is a minimum and maximum number of words to use for each answer.

If a step has more than one question, these maxima and minima are a total for all the questions in that specific step.
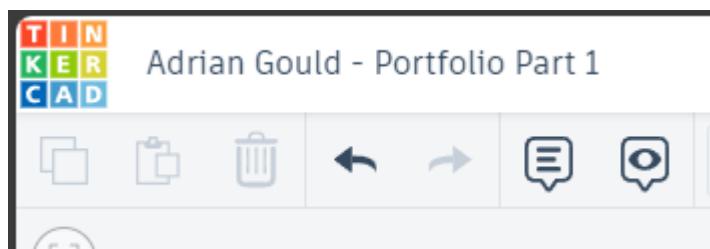
All answers must be in complete sentences unless indicated.

Unless otherwise directed, make sure to add any code you've written in a separate file to your submission. Also, unless otherwise directed, DO NOT put code in a Word document.
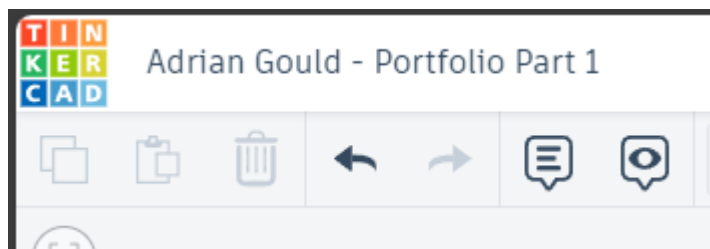
Answer 1 Analysis

Screenshot: GitHub Repo

Provide a screenshot of your empty GitHub repository (replace the image below).

Screenshot: Issues

Provide a screenshot of your repository issues (replace the image below).

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Screenshot: Kanban

Provide a screenshot of your project Kanban (replace the image below).
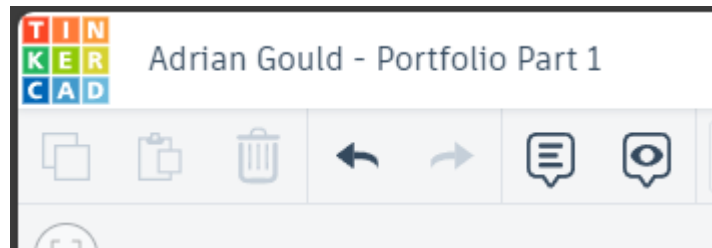
Answer 2 Companies Feature

No evidence required in this document.

Code must have been tracked, committed and pushed to your repository.

Answer 3 Positions Feature

No evidence required in this document.

Code must have been tracked, committed and pushed to your repository.

Answer 4 Users Feature

No evidence required in this document.

Code must have been tracked, committed and pushed to your repository.

Answer 5 Code Review

Screenshot: Company Feature Tests

Provide a screenshot of your Company test results (replace the image below).

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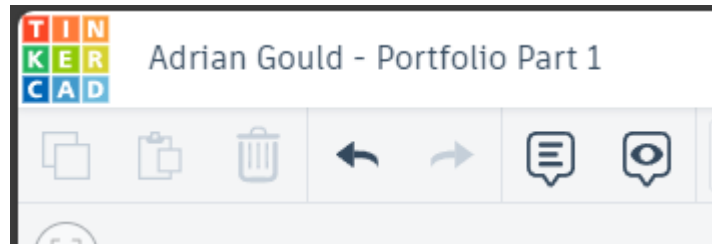| Qualification national code and title	ICT50220 Diploma of Information Technology (Advanced Programming)
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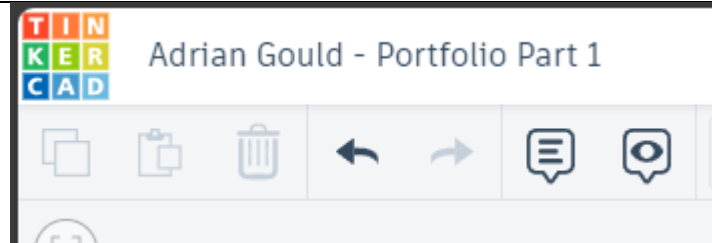
Screenshot: Position Feature Tests

Provide a screenshot of your Position test results (replace the image below).
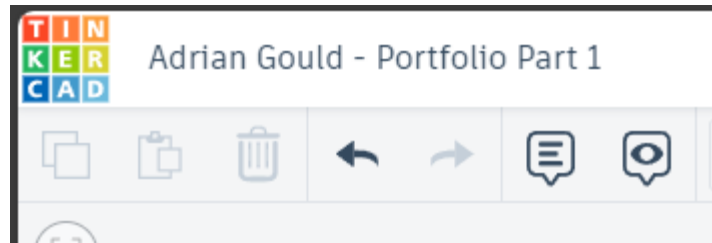
Screenshot: User Feature Tests

Provide a screenshot of your User test results (replace the image below).

Screenshot: xDebug Code Coverage

Provide a screenshot of your code coverage results (replace the image below).

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Answer 6 Authentication & Access Restriction

No evidence required in this document.

Code must have been tracked, committed and pushed to your repository.

Answer 7 Authorisation - Companies

Screenshot: Company Feature Tests

Provide a screenshot of your Company test results (replace the image below).

Answer 8 Authorisation - Positions

Screenshot: Position Feature Tests

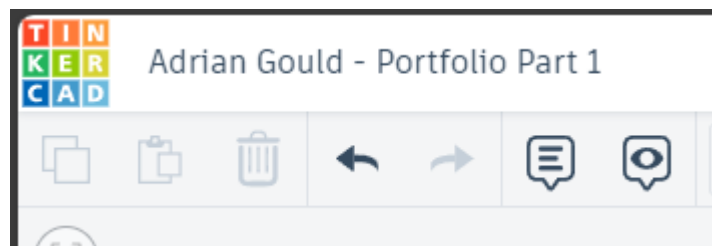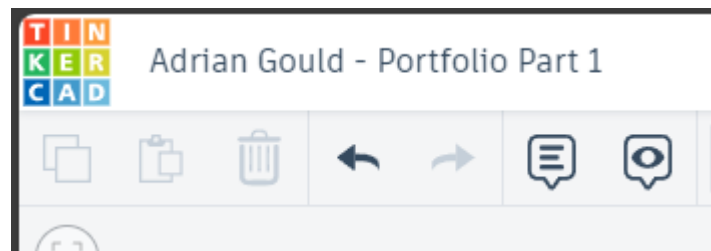Provide a screenshot of your Position test results (replace the image below).
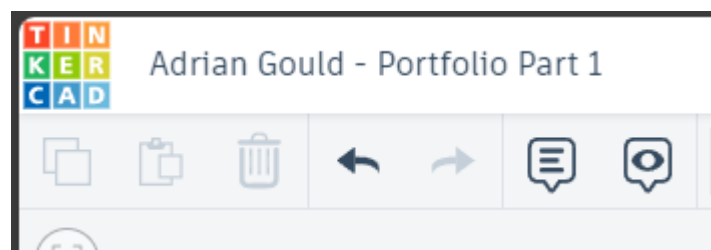
Answer 9 Authorisation - Users

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Screenshot: User Feature Tests

Provide a screenshot of your User test results (replace the image below).

Answer 10 Verify

No evidence required in this document.

Code must have been tracked, committed and pushed to your repository.
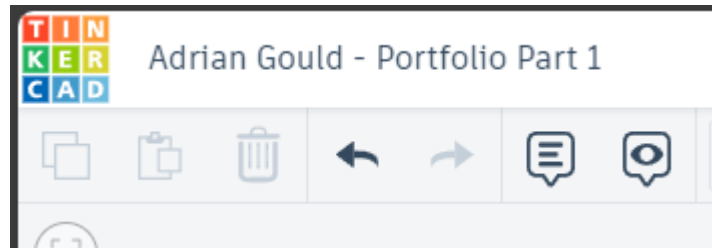
Answer 11 Book Demonstration

Screenshot: Demonstration Booking

Provide a screenshot of your booking within your Outlook Calendar (replace the image below).
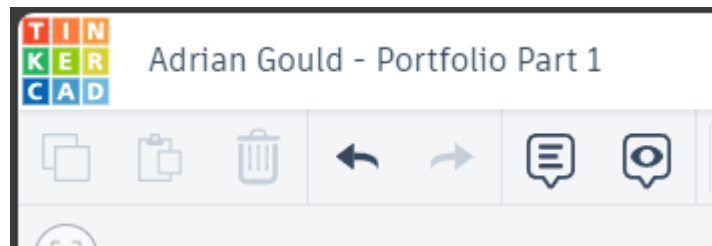
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Appendix A: Assessment Submission

These assessment submission guidelines are common for all submissions in this cluster.

DO NOT COMPRESS any of the following when submitting:

- MS Office Documents (including Word, Excel and other files)
- PDF Documents
- Images (if less than three)
- Video Recordings

COMPRESS the following:

- Project Code
- Images if more than 3

Any single submission must contain all required components unless stated.

Submissions must be completed BEFORE 5:30PM on the date specified at the beginning of the assessment, *unless otherwise indicated* in this document.

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Appendix B: Code Style and Commenting

Code File Headers

At the start of EVERY file written in a C-style language (C, C++, C#, PHP, JavaScript, et al), the following block of comment is required, and must be completed with the appropriate information:

```
/**
 * Assessment Title: Portfolio Part X
 * Cluster:        Intermediate RIoT
 * Qualification:  ICT50220 Diploma of Information Technology (Advanced Programming)
 * Name:           YOUR NAME
 * Student ID:     xxxxxxxxx
 * Year/Semester:  2024/S2
 *
 * YOUR SUMMARY OF PORTFOLIO ACTIVITY
 * GOES HERE
 */
```

Code Style (Naming Conventions)

For code written in a C-style language (C, C++, C#, PHP, JavaScript, et al), the following will be required…

Case (Upper/Lower/Mixed)

Case	Use For…	Example
Camel Case	Variables Methods Functions	ledState toggleSwitch() toggleLed()
Pascal Case	Class names	class Led() { …}
Snake case	n/a	bonus_value

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Shouty/Angry Snake Case	Constants	LED_1

Length

Use	Requirements	Example
Variables, Constants, Methods, Functions, Class Names…	Minimum one word NO abbreviations	ledState LED_1_PIN taxRate

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Code Style (Formatting)

Code must be formatted consistently to facilitate ease of reading, debugging and collaboration. The following will be used as basic requirements:

Rule	Requirements	Example

Indenting	Multiples of 2 or 4 spaces
	Do not mix indent sizes
		if (switchState == LOW) {
		  setLedOn(LED_1);
		}

Code Documentation (All Comments)

Commenting of code will depend on the requirements of the assessment or project. The following are good guidelines for good code documentation for use in your work:

Rule	Requirements	Example
Value	Comments must add value to the code	// Calculate the power using Ohm's law
Length	Lines should be less than 96 characters including prefixing symbols	// Determine taxation rate /** * Determine taxation rate */

Code Documentation (Doc Blocks)

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Doc Blocks are used for commenting of methods, function, and classes. They are required to explain what the purpose is and how to use the item being described.

Rule	Requirements	Example

Doc Block	Provide summary details
	Used for functions, methods and classes
	Defines inputs and types
	Defines output and types
	
	Start with `/**`
	
	Each line starts with: `*`
	
	Last line: `*/`
	
	General Structure:
	   - First line after /** is a one sentence short description - One blank line - Optional longer explanation with example usages - One blank line - Inputs - One blank line - Outputs Inputs and Outputs are optional, so if the function/method does not contain these then the detail may be omitted.
		`/**`
		`* LED On`
		`*`
		`* @input int ledPin`
		`*/`

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Appendix C: Referencing

You will be expected to use **MyBib** (https://mybib.com) to collate and create your references.

We **DO NOT** expect a university style references with in-text citations.

We **DO** expect to see any references to use APA 6 or APA 7 style

We **DO** expect to see references added after answers to questions.

For example:

> *Imagine that you're working on a project locally and bump into an exception. You try to figure out the problem, but you're unable to find a solution. In that case, you might want to ask a colleague for help.*
>
> *Introducing Laravel Error Share - Blog. (2024, June 6). Flare. https://flareapp.io/blog/introducing-laravel-error-share*

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Appendix D: Video Recordings

Video recording may be a required part of many of your submissions.

You may be required to record whilst demonstrating components of the assessment.

The following list is a set of basic requirements for video recordings:

- Recording MUST be done in LANDSCAPE mode only (image is WIDE not tall).
- The video MUST be recorded in a SINGLE take.
- No editing permitted.
- At the start you must:
    o Show your face
    o Verbally state the Cluster name
    o Verbally state the Assessment title
    o Verbally stating your name
    o Verbally state your student number
- When demonstrating you are expected to explain what you are showing.
- At the end of demonstrating you are expected to state your name once more.

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Appendix E: Portfolio Project Planning

Please refer to the following as a guide on how to plan the portfolio:

Using GitHub to Manage a Project

Getting started with project planning on GitHub - The GitHub Blog

- https://github.blog/developer-skills/github/getting-started-with-project-planning-on-github/

GitHub Projects and Issues to manage a software project:

- https://youtu.be/oPQgFxHcjAw?si=eUpDK8HlLNjFfHxs

GitHub Issues with Tasks

A good idea is to break down the big issues into a checklist of sub-tasks.

The best bit about this is that you may then convert them into individual GitHub issues. The following article describes how to do this.

Create Sub-Issues in GitHub Issues

- https://dev.to/keracudmore/create-sub-issues-in-github-issues-409m

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Appendix F: Git & GitHub

Version Control Requirements

All code must be version controlled and placed into a **PRIVATE** repository on GitHub or a similar remote system. Access to this repository **must** be given to the assessors and lecturers via their **TAFE eMail** address(es).

You must create a new *empty* **private** repository on GitHub (or equivalent) for this work. The repository will use the naming structure:

XXX-SaaS-BED-Portfolio

Replace XXX with your initials.

If you are repeating the cluster, then you must use the following format for your repository name:

XXX-SaaS-BED-Portfolio-YY-SN

Where YY is the two digit year and N is the semester of study.

Commit Messages

Commit messages **must** use the conventional commit style. This is outlined below:

Type of commit	Prefix	Example	Notes
Start of project	init	init: Start of Project	
Feature work	feat	feat: Add User create method	
Feature with identifier	feat(…)	feat(user): Add create method	*Preferred*
Bug fix	fix(…)	fix(user): Fix issue #1234	
Documentation	docs(…)	docs(user): Update Scribe documentation	*Preferred*

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Other conventional commit message types are available, and you are directed to Conventional Commits (https://www.conventionalcommits.org/en/v1.0.0/) for more guidance and examples.

Note that conventional commits allow for multiple line comments. For example:

> feat(user): Update browse API
>
> - Add pagination to user API
> - Add example use to API docs
>
> close #1234

You may also link commits to your issues, and automatically close them by using the following keywords and syntax:

- fix #xxx
- close #xxx
- resolve #xxx

We suggest using close when completing a new (sub-)feature and resolve when completing a bug-fix.

Further useful details see below.

Further Git/GitHub Resources

These resources will assist you in creating good commit messages, pull requests and provides other useful version control resources.

Commit Message Related

Conventional Commits provide useful commit messages for anyone involved in a project.

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- Conventional Commits Cheat sheet (github.com)
    - https://gist.github.com/qoomon/5dfcdf8eec66a051ecd85625518cfd13

Using commit messages to close issues is a great time saver.

- Closing Issues via Commit Messages - The GitHub Blog
    - https://github.blog/news-insights/product-news/closing-issues-via-commit-messages/

Requests and Issues

Linking a pull request to an issue - GitHub Docs

- https://docs.github.com/en/issues/tracking-your-work-with-issues/linking-a-pull-request-to-an-issue

General GitHub Issues

Quickstart for GitHub Issues - GitHub Docs

- https://docs.github.com/en/issues/tracking-your-work-with-issues/quickstart

GitHub Issue Templates

- https://youtu.be/UPsCXqxxJUA?si=xj7Dom12MymZxn_S

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