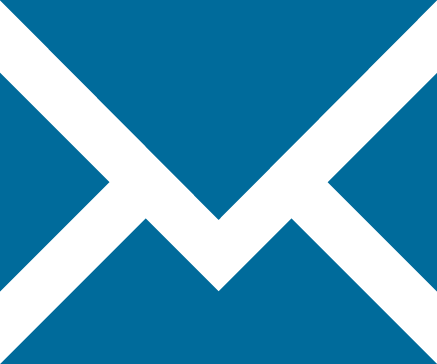
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| Individual Project Specification – DevOps Core |
| QA Learning academy Training Based Project Specification |

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# Introduction

The purpose of this document is to outline the individual project specification that you will be working on during the training. This project will involve concepts from all core training modules; more specifically, this will involve:

* Agile
* Python Fundamentals
* Python Testing
* Git
* Basic Linux
* Python Web Development
* Continuous Integration
* Cloud Fundamentals
* Databases

The individual project can be on any subject you deem fit of encapsulating all aspects of the aforementioned modules. This could be a business case, such as a library or supermarket system, or something to do with a hobby of yours – as long as the application is CRUD functional.

This is purposefully open as we want to endorse creativity and give you an opportunity to do a project that you have full command over. It is in your interest do something you are passionate about, as past experience has shown these to be the best projects.

# Objective

The overall objective of the project is the following:

* To create a CRUD application with utilisation of supporting tools, methodologies and technologies that encapsulate all core modules covered during training.

# Scope

The requirements set for the project are below. Note that these are a minimum set of requirements and can be added onto during the duration of the project.

The requirements of the project are as follows:

* A Trello board (or equivalent Kanban board tech) with full expansion on user stories, use cases and tasks needed to complete the project. It should also provide a record of any issues or risks that you faced creating your project.
* A relational database used to store data persistently for the project, this database needs to have at least 2 tables in it, to demonstrate your understanding, you are also required to model a relationship.
* Clear Documentation from a design phase describing the architecture you will use for you project as well as a detailed Risk Assessment.
* A functional application created in Python, following best practices and design principles, that meets the requirements set on your Kanban Board
* Fully designed test suites for the application you are creating, as well as automated tests for validation of the application. You must strive to provide high test coverage in your backend and provide consistent reports and evidence to support a TDD approach.
* A functioning front-end website and integrated API’s, using Flask.
* Code fully integrated into a Version Control System which will subsequently be built through a CI server and deployed to a cloud-based virtual machine

You should consider the concept of MVP (Minimum Viable Product) as you plan your project, completing all the requirements above before you add extra functionality that is not specified above.

# Constraints

The time constraint of this application will be discussed when the specification is given out, as this can fluctuate based on several factors.

The other constraint for this is certain technology that needs to be used. The application needs to utilise the technology discussed during the training modules. The tech stack required would be the following:

* Kanban Board: Trello or an equivalent Kanban Board
* Database: GCP SQL Server or other Cloud Hosted managed Database.
* Programming language: Python
* Unit Testing with Python
* Front-end: Flask (HTML)
* Version Control: Git, you will be provided with a Global Repository that you must use.
* CI Server: Jenkins
* Cloud server: GCP Compute Engine

# Deliverable

The final deliverable for this project is the completed application with full documentation around utilisation of supporting tools. This will require a fully functional application based on the domain that you have chosen.

A presentation of work may also be required towards the end of the deadline. However, you will be required to produce weekly reports of any designs and work created throughout the duration of the project.

You will be required to push you code to the Master branch once a week, this is so that the Trainer can keep track of your progress and offer more bespoke support.

# Marking Scheme

Below are the skills that we will be evaluating for this Databases assessment. These skills are as described in the SFIA 7 framework; please see below if you wish to have more information:

<https://www.sfia-online.org/en/framework>

The skills this assessment will discussed are the following:

* Programming/software development
* Systems integration and build
* Software Design
* Testing

Programming/software development

Designs, codes, verifies, tests, documents, amends and refactors simple programs/scripts. Applies agreed standards and tools, to achieve a well-engineered result. Reviews own work.

Systems integration and build

Produces software builds from software source code. Conducts tests as defined in an integration test specification, records the details of any failures. Analyses and reports on integration test activities and results. Identifies and reports issues and risks.

**SOFTWARE DESIGN**

The specification and design of software to meet defined requirements by following agreed design standards and principles. The definition of software, components, interfaces and related characteristics.

**TESTING**

The planning, design, management, execution and reporting of tests, using appropriate testing tools and techniques and conforming to agreed process standards and industry specific regulations.

Programming/Software Development – marking scheme

Below is the list of criteria that will be assessed from your deliverable:

|  |  |  |
| --- | --- | --- |
| **SFIA Skill** | **Rating** | **Details** |
| Designs, codes, verifies, tests, documents, amends and refactors simple programs/scripts. | 1 | Software is missing functionality in major areas for creating, reading, updating and deleting. No tests implemented and designs documented were not implemented. Best practices not adhered to in the project. |
| 2 | Software functionality is working in areas but is not a fully working product. Tests were not implemented; code was commented in small areas. Parts of the project adhered to best practices but not consistently throughout the software. |
| 3 | Software is functional in all major areas but still has small bugs and/or errors. Tests were beginning to be implemented, with basic functions being tested. Best practices were adhered to for most areas of the project. |
| 4 | Software is fully functional and has been tested in all relevant areas. Best practices were consistently adhered to throughout the project. |
| 5 | Software is fully functional and has been tested in all areas, with best practices and refactoring adhered to and implemented throughout the project. Software implements concepts outside of the brief specified at a good level. |
| Applies agreed standards and tools, to achieve a well-engineered result. | 1 | Tools and workflows discussed in software documentation around design not implemented to a quality capacity. |
| 2 | Tools and workflows are referred to within the project, but the implementation is minimal. |
| 3 | Tools and workflows discussed in documentation are implemented throughout the project at a high level, but more exploration could have occurred. |
| 4 | Software produced is in line with the documentation with changes made where needed, with references to refactoring apparent in key areas. |
| 5 | Software fully implements designs with justifications as to why changes were made where needed. Refactoring of code is rife throughout all relevant areas of the software. |

Systems integration and build – marking scheme

Below is the list of criteria that will be assessed from your deliverable:

|  |  |  |
| --- | --- | --- |
| **SFIA Skill** | **Rating** | **Details** |
| Produces software builds from software source code | 1 | VCS implementation was non-existent. Build server was not installed and therefore no builds of software were created. |
| 2 | VCS implementation was attempted but structure was poor and/or content in VCS was irrelevant. Build server was installed but software did not build successfully from repository. |
| 3 | VCS was implemented and code was stored in a structured manner. Some of the content in the VCS could have been omitted but the majority was relevant. Build server installed and successfully built software manually. |
| 4 | VCS was implemented and code was stored in a structured manner with branches. All VCS content was relevant, no unnecessary files. Build server installed and successfully built software after a push. |
| 5 | VCS was implemented and code was stored in a structured manner with branches, git ignore file and scripted hooks. All files relevant to the repo, nothing unnecessary. Build server installed and successfully built software after a push with artefact produced for successful builds. Use of a configuration file to make build jobs portable. |
| Conducts tests as defined in an integration test specification, records the details of any failures. Analyses and reports on integration test activities and results. Identifies and reports issues and risks. | 1 | No tests written for back-end. No logs or reports about application produced. No risks recorded or monitored. |
| 2 | Basic tests written for back-end. Results produced not acknowledged in any way. Some Risks acknowledged but not formally followed up. |
| 3 | Basic tests written the back-end. Results are tabulated and logged but no further follow up. A simple Risk analysis has been performed |
| 4 | Majority of tests for relevant features within the app are created in the back-end of application. Results of tests logged and discussed in report for test coverage. A more formal Risk assessment process has been followed. |
| 5 | Tests for all relevant CRUD features within the app are created in both the back-end of the application. Results of tests logged and discussed in report for test coverage. Further addition of code quality checking is also implemented. A formal risk assessment process followed and updated, analysis performed at end of project. |

Software Design – marking scheme

Below is the list of criteria that will be assessed from your deliverable:

|  |  |  |
| --- | --- | --- |
| **SFIA Skill** | **Rating** | **Details** |
| Creates and documents detailed designs for simple software applications or components applying agreed modelling techniques, standards, patterns and tools. | 1 | No Designs provided |
| 2 | Simple designs provided but not adhering to agreed standards and patterns. |
| 3 | Simple designs provided meeting the agreed standards and patterns. |
| 4 | Extensive Designs provided on both a system level and component level. |
| 5 | Evolution of designs evident as the project progressed in all aspects. |

Testing – marking scheme

Below is the list of criteria that will be assessed from your deliverable:

|  |  |  |
| --- | --- | --- |
| **SFIA Skill** | **Rating** | **Details** |
| Designs test cases and creates test scripts and supporting data | 1 | No tests written. |
| 2 | Basic tests written for back-end. Results produced not acknowledged in any way. |
| 3 | Adequate tests written for the back-end. |
| 4 | Majority of tests for relevant features within the app are created. |
| 5 | Tests for all relevant CRUD features within the app are created. Further addition of code quality checking is also implemented via a tool like SonarQube. |
| Analyses and reports test activities and results | 1 | No tests written. No logs or reports about application produced. |
| 2 | Basic tests written for back-end. Results produced not acknowledged in any way. |
| 3 | Results of tests are tabulated and logged but no further follow up. |
| 4 | Results of tests logged and discussed in report for test coverage. |
| 5 | Results of tests logged and discussed in report for test coverage. Further addition of code quality checking is also implemented, with the results provided. |