# Assessment Brief

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| Subject Code and Name | DEV1004 - DevOps |
| Assessment Number | 3 |
| Assessment Title | Develop a Continuous Integration / Continuous Deployment (CI/CD) Pipeline |
| Assessment Type | Individual Programming Project |
| Words, Size or Duration | 1 programming project |
| Subject Learning Outcomes | SLO3, SLO4, SLO5, SLO6 |
| Submission Date / Time | Due by 11:55pm AEST Sunday end of Module 4. |
| Weighting | 45% |

## Assessment Purpose

Automation allows developers to spend less time on repetitive, menial tasks and focus more on creative or problem solving tasks. For a business, this means that there's a more efficient use of company time. One of the most common implementations of automation is a continuous integration/continuous delivery (CI/CD) pipeline - a system that performs specific actions when conditions are met or triggers are activated. This could be packaging an application into a container for scalable deployments, running automated tests to confirm an application's stability, a mix of both, and anything else that could be written as programming code.

To solidify your knowledge of modern software development concepts and show your ability to work with continuous integration/continuous delivery (CI/CD) pipelines, you should be able to write code to appropriately automate common actions such as software testing and deployment.

## Assessment Task / Item

For this assessment, you must submit an application that meets the design and programming requirements to showcase your skills as a software developer.

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## Assessment Instructions

Using a continuous integration/continuous delivery (CI/CD) platform, write automation workflow files in a format appropriate to that continuous integration/continuous delivery (CI/CD) platform. These workflow files will:

- Contain instructions to install or otherwise initialise an existing application in a continuous integration/continuous delivery (CI/CD) environment
- Execute any compilation, testing, or configuration actions with the existing application when run by the platform.
- Push new deployments of an application to an appropriate cloud platform.
- Configure any connections between the new deployment and any required services.

**Design requirements**

The project README.md or other linked documentation file must explain:

- The chosen continuous integration/continuous delivery (CI/CD) tools and systems
    - What those specific tools or systems do and will be used for
    - Why those specific tools or systems were chosen over alternatives

**Programming requirements**

The workflow files must:

- Be syntactically correct and execute successfully
- Use DRY programming principles
- Facilitate the successful deployment of an application
- Install any dependencies of the application as required by the application's package dependency file (such as package.json or gemfile).
- Run an automated test suite that contains multiple different tests related to the application's functionality and features. All tests must pass.
- Configure any required services (such as file storage or databases) with appropriate credentials and environment settings.
- Deploy the application to an appropriate service within a cloud hosting platform (such as Google Cloud Run in Google Cloud Platform or AWS EC2 in Amazon Web Services).

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## Submission

All work must be submitted via Canvas, in the assignments section appropriate to this brief. Please ensure the above mentioned submission date and/or time are adhered to, or penalties may apply.

When submitting your work, please save your files using the naming convention below.

[Student_ID]_[Surname]_[First Name]_[SubjectCode]_[Assessment_#].zip

E.g.: **1234_Singh_Visha_PRG1002_Assessment_01.zip**

For more information on late submission, please see the **Assessment Policy**.

## Academic Integrity

The integrity of the assessment process is fundamental for ensuring appropriate evaluation at AIT. All work submitted should be your own, and where additional resources are used, they must be referenced according to the Harvard style. Additionally, TurnItIn is available in the LMS to test plagiarism in your writing.

For more information on academic integrity, please see the **Academic Integrity** and **Academic Integrity Penalties Policies**.

## Appeals

Fair application of the assessment rubric, rules and guidelines should be administered for each assessment. If you feel an evaluation requires further consideration, you may be entitled to an appeal.

For more information on your right to an appeal, please see the **Assessment Appeals Procedure and Policy.**

## Policies

For access to the policies mentioned above and related to education at AIT, please see the footer of the AIT website, and follow the link named **Education Policies and Procedures.**

Website: https://www.ait.edu.au

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## Assessment Rubric

| Task Descriptor | (HD) High Distinction *(85-100%)* | (D) Distinction *(75-84%)* | (C) Credit *(65-74%)* | (P) Pass *(50-64%)* | (F) Fail *(0-49%)* |
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| *DEVELOPS semantically and syntactically valid & complete automation workflow files.* **10%** SLO 5 | Implements at least one automation workflow files or help files which are COMPLETELY semantically & syntactically valid. | Implements at least one automation workflow files or help files which are ALMOST COMPLETELY semantically & syntactically valid. | Implements at least one automation workflow files or help files which are MOSTLY semantically & syntactically valid. | Implements at least one automation workflow files or help files which are SOMEWHAT semantically & syntactically valid. | The relevant automation workflow files either do not exist or are almost entirely semantically & syntactically invalid. |
| *CREATES appropriate files or commands to automate a testing process* **15%** SLO 3, SLO 4, SLO 5 | Meets D criteria, plus uses the automation workflow to store logs in a persistent location. | Uses at least ONE automation workflow file to automate a testing process at a DETAILED level, such as building a custom log file out of the testing results. | Uses at least ONE automation workflow file to automate a testing process at a SOMEWHAT-BASIC level, such as running a test suite with formatted output. | Uses at least ONE automation workflow file to automate a testing process at a BASIC level, such as running a test suite with default output. | The automation workflow file is either syntactically invalid, or does not facilitate automated testing, or no tests are carried out. |
| *CREATES appropriate files or commands to automate a deployment process* **15%** SLO 6 | Meets D criteria, plus uses the automation workflow to preserve deployment revisions in a cloud hosting service. | Meets C criteria, plus uses environment-specific settings & connections for databases & other services. | Meets P criteria, plus uses at least one environment variable appropriately. | Uses at least ONE automation workflow file to automate a deployment process at a BASIC level, such as deploying an app to a cloud hosting service. | The automation workflow file is either syntactically invalid, or does not facilitate automated deployment, or no deployment is carried out. |
| *CREATES appropriate triggers for an automation workflow* **10%** SLO 5 | Uses at least TWO continuous integration/continuous delivery (CI/CD) workflow triggers or events at a complex level to initiate an automated workflow, including conditions, schedules, or dependent workflows. | Uses at least ONE continuous integration/continuous delivery (CI/CD) workflow triggers or events at a complex level to initiate an automated workflow, including conditions, schedules, or dependent workflows. | Uses at least TWO continuous integration/continuous delivery (CI/CD) workflow triggers or events at a basic level to initiate an automated workflow. | Uses at least ONE continuous integration/continuous delivery (CI/CD) workflow triggers or events at a basic level to initiate an automated workflow. | The automation workflow file is either syntactically invalid, or does not use any appropriate triggers. |

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| *DEVELOPS optimised automation workflow scripts to a professional level*<br>**10%**<br>SLO 3, SLO 5 | Meets D criteria, plus creates functionality to cover AT LEAST ONE of the following: writing a custom action/plugin to use within a workflow, export workflow files as downloadable items, export workflow data to reuse in additional workflows. | Meets C criteria, plus uses secrets or encrypted keys in an optimal, secure way. | Meets P criteria, plus uses environment variables where appropriate. | Uses variables & other reusable code to optimise an automated workflow. | The automation workflow file makes no use of required optimization techniques. |
| *EXPLAINS the purpose & functionalities of an automation workflow*<br>**20%**<br>SLO 3, SLO 4 | EXTENSIVE explanation of ALL of the purpose & functionalities of an automation workflow, with diagrams and examples. | MODERATELY-DETAILED explanation of ALL of the purposes & functionalities of an automation workflow, with diagrams or examples. | EXTENSIVE explanation of SOME of the purpose & functionalities of an automation workflow, with diagrams and examples. | MODERATELY-DETAILED explanation of SOME of the purpose & functionalities of an automation workflow, with diagrams or examples. | Explanation provided is either completely incorrect, not containing relevant details, or not provided at all. |
| *EXPLAINS the relations & dependencies of services & technologies involved in an application managed by a continuous integration/continuous delivery (CI/CD) platform*<br>**20%**<br>SLO 3, SLO 4, SLO 5, SLO 6 | EXTENSIVE explanation of ALL of the services & technologies used by an application managed by a continuous integration/continuous delivery (CI/CD), comparison to alternative software, and with the explanation including diagrams and examples. | MODERATELY-DETAILED explanation of ALL of the services & technologies used by an application managed by a continuous integration/continuous delivery (CI/CD), comparison to alternative software, and with the explanation including diagrams and examples. | EXTENSIVE explanation of SOME of the services & technologies used by an application managed by a continuous integration/continuous delivery (CI/CD), with diagrams and examples. | MODERATELY-DETAILED explanation of SOME of the services & technologies used by an application managed by a continuous integration/continuous delivery (CI/CD), with diagrams or examples. | Explanation provided is either completely incorrect, not containing relevant details, or not provided at all. |