

INFORMATION TECHNOLOGY PROGRAMME

**SOFT806 Continuous Integration and Continuous Deployment**

**Trimester 1, 2024**

**Individual Assignment**

# Due: 4:00 pm, Friday 12th March 2024

This assignment is worth **50** **% of the total marks in the course** and will cover the following learning outcomes as listed in the Course Outline:

**Learning Outcome [1]:** Analyse project requirements to select, install and configure continuous integration and deployment tools.

**Learning Outcome [2]:** Evaluate and select continuous integration tools to automate the build and deployment process.

**Learning Outcome [4]:** Analyse project requirements to select and use package management software tools.

**Learning Outcome [4]:** Identify, analyse, and pursue both self-directed and group-based investigation into technical problems, and report on this in appropriate formats, including written reports and oral presentations.

General Instructions:

* Include a cover page that includes your name, student ID, course code and title, assignment title
* All sources should be acknowledged in the main body of the assignment and in a reference list at the end of the assignment. You are also required to reference any tools/software/applications used. Refer to the 7th edition of the APA referencing style guide. Examples of how to present references can be found here: <https://apastyle.apa.org/style-grammar-guidelines/references/examples>.
* Your assignment should be your own work to demonstrate your thinking. Any direct quotes from any source should be placed in “quotation marks”.
* Upon submission, your assignment will be checked for copied materials as well as the use of AI (artificial intelligence), with penalties to be applied where appropriate and if not referenced.
* You may resubmit draft versions of your assignment **until the due date**. After the due date, the latest version will be accepted as the final version. Note that similarity reports may take 24 hours to generate.
* Resources to assist with writing skills can be found at <https://moodle.ais.ac.nz/course/view.php?id=4#section-4>
* Late submissions will be penalised by 5% of the available marks from the marks awarded per working day (24 hours) for up to four days and receive a zero mark after four days. (96 hours).

# Deliverables:

# Zip folder including the following:

# Reports

# Complete the application including the source code.

# Database Script

# Zip folder including the following:

# Presentation file

# Recording file

# Where: Moodle Dropbox

**Summary of Marking Criteria**

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| **Tasks** | **Description** | **Max Marks** |
| **Task 1** | Evaluation and selection of continuous integration tools. | **36** |
| **Task 2** | Installing, configuring, and using continuous integration tools. | **50** |
| **Task 3** | Evaluate and select package management software tools | **14** |
|  | **Total Marks** | **100** |

**Submission Instructions**

1. **You need to submit the report (Task 1) through Moodle Turnitin.**
2. **Create a folder as *Assignment1-Report-YourName***
3. **Place the following in the folder *Assignment1-Report-YourName***

* **Reports**
* **Complete the application including the source code.**
* **Database Script**

1. **Create a folder as *Assignment1-Presentation-YourName***
2. **Place the following in the folder *Assignment1-Presentation-YourName***

* **Presentation file**
* **Recording file**

1. **Before submitting your work, create .zip files for the above *Assignment1-Report-YourName* folder and *Assignment1-Presentation-YourName*, then submit the .zip files via appropriate Moodle drop boxes.**

**Instructions for the Report:**

* Make sure that the report is in Microsoft Word processing format.
* Report must have an index/content page.
* Use size 12 font, Times New Roman style; 1.5 spacing between the lines; use the same format (font and layout) throughout the assignment.
* Use *main headings* and *sub-headings* to help structure your assignment into sections.
* *Number* the pages of the assignment.
* Ensure no spelling mistakes (Use the Spelling and Grammer feature of MS Word or Grammarly app).
* A good standard of English grammar is expected.
* Reference *all* ideas, quotes and information, which you use from books, articles and the Internet in the APA format; include a reference list at the end of the report.
* *Plagiarism* is academic dishonesty and will not be tolerated. Students will be brought before the Student Disciplinary Committee and will be penalised if found guilty of academic dishonesty.
* Report should be submitted online using the Moodle drop box via Turnitin. The report will be screened using the Turnitin software to check for plagiarism.

**Instructions for the Database Script:**

* You need to provide complete SQL script for creating the database, and the tables.
  + Create a notepad file with the name SQL-Script-DDL, place your SQL script in the file.
* You also need to provide SQL script to insert sample data.
  + Create a notepad file with the name SQL-Script-DML, place your SQL script in the file.
* Place both files (SQL-Script-DDL and SQL-Script-DML) in the Assignment1YourName folder before making the .Zip file.

# There are three (03) tasks in this assignment. Read the below scenario carefully and attempt the tasks followed by the scenario.

**Scenario: Southern Institute of Studies (SIS)**

Southern Institute of Studies (SIS) is a fictitious tertiary educational institute. The SIS is one of New Zealand’s newly established educational institutes. SIS offers the following programs: two 6-month certificates (certificate in IT and certificate in business) and four 1-year diploma programmes (diploma in IT level 5, diploma in IT level 6, diploma in Business level 5, diploma in business level 6).

Due to the growth (increased number of students), it has become difficult for SIS management and staff to manage programs, lecturers, courses, students, and their marks manually. Therefore, the management team of SIS has decided to use automation software to run their business operations.

As a software developer, you must develop a web-based SIS application. The application should mainly consist of 6 modules: Programs, Lecturer’s information, Student’s information, Student Marks, Students’ parent information, and students’ tuition fee.

**For developing a web-based application for SIS,** you must work in a team together with other two (2) software developers i.e. Michael and Jimmy. Your team has planned to develop a web application using open source technologies such as PHP as server-side script and MySQL in the back-end.

For code integration and delivery, Michael and Jimmy are keen to use continuous integration and delivery tools. You have been asked to attempt the following tasks before starting web-based application development.

**Task 1: Evaluation and selection of continuous integration tools. (Total for task 1: 36 Marks)**

1. Report in Word Format: The report should cover Task 1-B and Task 1 C. The report should be in the appropriate format (see the instructions above). You should use APA 7 to reference the source of information. **(12 Marks)**

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| **Report** | **4 – Excellent** | **3 – Good** | **2 – Fair** | **1 – Poor** | **0 – Very Poor** |
| Coverage | The report evaluates four CI tools with seven to eight features of each tool. | The report evaluates four CI tools with five to six features of each tool. | The report evaluates four CI tools with three to four features of each tool. | The report evaluates three or fewer CI tools with two or fewer features of each tool. | Missing evaluation |
| Layout and writing | Structured layout. Consistent font and size. Accurate grammar and spelling. Includes contents page (MS Word feature, easy navigation) and all pages are numbered. | Structured layout. Consistent font and size. Some grammar and spelling issues. Includes contents page (manual but easy navigation) and all pages are numbered. | Minor layout issues. Inconsistent font and size. There are a few grammar and spelling issues. Includes contents page (manual, navigation issues) and no page numbering | Inappropriate layout. Inconsistent font and size. Significant writing or grammar or spelling issues. The contents page is missing. No page numbering | Incorrect layout. Inconsistent fonts and size. Major writing or grammar or spelling issues. The contents page is missing. No page numbering |
| APA7 citation | Correct APA7 references (seven to eight) | Correct APA7 references (five to six) | Correct APA7 references (three to four) | Incorrect APA7 format. Two or less reference | Missing references |

1. In this task, you are required to analyse the above project requirements (Scenario: Southern Institute of Studies (SIS) ). Based on the analyses, investigate and evaluate any four continuous integration tools that are suitable for the above scenario. Your evaluation may include but is not limited to the tool’s cost, support, and popularity. You are required to evaluate eight (8) key features of each CI tool. **(16 Marks)**

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| **CI Tools** | **4 – Excellent** | **3 – Good** | **2 – Fair** | **1 – Poor** | **0 – Very Poor** |
| CI Tool 1 | Evaluation shows an excellent level of understanding and knowledge of the tool. The features are evaluated and explained in a logical progression with specific details and cites the references correctly. | Evaluation shows good level of understanding and knowledge of the tool. The features are evaluated and explained in a seemingly random fashion with specific details and cites the references correctly. | Evaluation shows a fair level of understanding and knowledge of the tool. The features are evaluated and explained in a seemingly random fashion, lacking details, and cites the references incorrectly. | Evaluation shows a lack of understanding and knowledge of the tool. No citations. | Missing evaluation |
| CI Tool 2 | Evaluation shows an excellent level of understanding and knowledge of the tool. The features are evaluated and explained in a logical progression with specific details and cites the references correctly. | Evaluation shows good level of understanding and knowledge of the tool. The features are evaluated and explained in a seemingly random fashion with specific details and cites the references correctly. | Evaluation shows a fair level of understanding and knowledge of the tool. The features are evaluated and explained in a seemingly random fashion, lacking details, and cites the references incorrectly. | Evaluation shows a lack of understanding and knowledge of the tool. No citations. | Missing evaluation |
| CI Tool 3 | Evaluation shows an excellent level of understanding and knowledge of the tool. The features are evaluated and explained in a logical progression with specific details and cites the references correctly. | Evaluation shows good level of understanding and knowledge of the tool. The features are evaluated and explained in a seemingly random fashion with specific details and cites the references correctly. | Evaluation shows a fair level of understanding and knowledge of the tool. The features are evaluated and explained in a seemingly random fashion, lacking details, and cites the references incorrectly. | Evaluation shows a lack of understanding and knowledge of the tool. No citations. | Missing evaluation |
| CI Tool 4 | Evaluation shows an excellent level of understanding and knowledge of the tool. The features are evaluated and explained in a logical progression with specific details and cites the references correctly. | Evaluation shows good level of understanding and knowledge of the tool. The features are evaluated and explained in a seemingly random fashion with specific details and cites the references correctly. | Evaluation shows a fair level of understanding and knowledge of the tool. The features are evaluated and explained in a seemingly random fashion, lacking details, and cites the references incorrectly. | Evaluation shows a lack of understanding and knowledge of the tool. No citations. | Missing evaluation |

1. Based on the evaluation (Task 1A), select/recommend any two (2) continuous integration tools as Plan A (first choice) and Plan B (second choice). You should provide an appropriate justification for your tool selection. Why would you choose a tool as Plan A and why other as a Plan B. Your recommendations should base on the evaluations of **at-least eight (8)** **common features** such as cost, efficiency, user interface. **(8 Marks)**

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| Plan A | Selection of the tool shows an excellent level of understanding and knowledge of the tool and project requirements. The justification correctly connects the features (7 to 8 features) of the tools, thoughts, and project requirements logically. | Selection of the tool shows a good level of understanding and knowledge of the tool and project requirements. The justification connects the features (5 to 6 features) of the tools, thoughts, and project requirements to some extent. | Selection of the tool shows a fair level of understanding and knowledge of the tool and project requirements. The justification loosely connects the features (3 to 4 features) of the tools, thoughts, and project requirements. | Selection of the tool shows a lack of understanding and knowledge of the tool and project requirements. The justification does not connect the features of the tools, thoughts, and project requirements. | Missing selection and justification. |
| **Plan B** | Selection of the tool shows an excellent level of understanding and knowledge of the tool and project requirements. The justification correctly connects the features (7 to 8 features) of the tools, thoughts, and project requirements logically. | Selection of the tool shows a good level of understanding and knowledge of the tool and project requirements. The justification connects the features (5 to 6 features) of the tools, thoughts, and project requirements to some extent. | Selection of the tool shows a fair level of understanding and knowledge of the tool and project requirements. The justification loosely connects the features (3 to 4 features) of the tools, thoughts, and project requirements. | Selection of the tool shows a lack of understanding and knowledge of the tool and project requirements. The justification does not connect the features of the tools, thoughts, and project requirements. | Missing selection and justification. |

# Task 2: Installing, configuring, and using continuous integration tools. (Total for task 2: 50 marks)

1. Install two (2) continuous integration tools that you have chosen as Plan A and Plan B (Task 1C). **(10 marks)**

# Requirement:

* + Take a snapshot of each step.
  + Briefly describe (in a sentence or two) each step of the installation.

## **Submission:**

## **Report in Word Processing Format**

## You must add (snapshots and a description of each step) as **Part-2A** in the Report.

**10 Marks are distributed as follows:**

***2 x 4 marks (total 8 marks) for successfully installing two (2) continuous integration tools (you need to provide a snapshot and describe each step).***

***Note: marks may be reduced if required snapshots are missing or appropriate description is not provided***

***1 mark for appropriate format (well-organised snapshots, all snapshots properly labelled.***

***1 mark for well-organised content.***

1. After the installation, you are required to configure both tools and install the required plugins or extensions considering the above Scenario: Southern Institute of Studies (SIS). **(10 marks)**

# Requirement:

* + Take a snapshot of each step.
  + Describe each step of the configuration.

## **Submission:**

## **Report in Word Processing Format**

## You must add (snapshots, and description of each step) as **Part-2B** in the Report

**10 Marks are distributed as follow:**

***2 x 4 marks (total 8 marks) for successfully configuring two (2) continuous integration tools (you need to provide a snapshot and describe each step).***

***Note: marks may be reduced if required snapshots are missing or an appropriate description is not provided***

***1 mark for appropriate format (well organised snapshots, all snapshots all properly labelled.***

***1 mark for well organised contents.***

1. Create a simple application of your choice i.e. web, mobile or desktop using any programming language. Your application should have three separate units: register, login, and main form, which should be displayed on successful login. After creating the application with three separate units, integrate all three application units using both continuous integration tools you have installed and configured in previous tasks (Taks 2A and 2B). **(30 marks)**

# Requirement:

* + Take a snapshot of each step.
  + Describe each step of using a continuous integration tool.

## **Submission:**

## **Report in Word Processing Format**

## **Application with three separate units**

## **SQL Script for creating a database**

## You must add (snapshots and descriptions of each step) as **Part-2C** in the Report.

**Marks are distributed as follow:**

***2 x 10 marks (total 20 marks) for successfully using two (2) continuous integration tools (you need to provide a snapshot and describe each step).***

***Note: marks may be reduced if required snapshots are missing or an appropriate description is not provided***

***5 marks for appropriate format (well organised snapshots, all snapshots all properly labelled.***

***5 marks for well organised contents.***

# Task 3: Evaluating, installing, and using package management software tools

# (Total for task 3: 14 marks)

In this task, you are required to analyze the above project requirements in the scenario: Southern Institute of Studies (SIS). Based on the analyses evaluate and select package management tools.

1. You have been asked to research, investigate, and evaluate any two-package management software based on the Windows platform. Your evaluation may include features of package management tools. You are required to evaluate four (4) key features of each tool. **(8 Marks)**

**8 Marks are distributed as follow:**

***2 x 4 marks (Total 8 Marks) for elaborating 4 key features of each package management tool.***

1. Based on the evaluation (Task 1B), select/recommend any one package management tool. You should provide an appropriate justification for your tool selection. **(2 Marks)**

**2 Marks are distributed as follow:**

***1 mark for providing recommended package management tool.***

***1 mark for providing appropriate justification***

1. Based on the evaluation (Task 3B), install or un-install any package by using the package management tool. **(4 Marks)** **Requirement:**

* **Take a snapshot of each step.**
* **Describe each step of using a package management tool.**

**4 Marks are distributed as follow:**

***2 mark for successfully installing or un-installing the package.***

***1 mark for providing snapshots***

***1 mark for providing appropriate description.***