# Luminus Technical University College - Assignment Brief (RQF)

**Pearson BTEC Level 5 Higher National Diploma in Cloud Computing**

**(Cloud Software Development)**

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| **Student Name** | | **Shahed Montaser** | | | **Language of assessment** | | | **AR** | **EN** |
| **College ID:** | | | **22036814** | |
| **Pearson ID:** | | | **RE67234** | |
| **Unit Number and Title** | | **20** | Application Development, Testing and Debugging | | | | | | |
| **Academic Year** | | **2023/2024 (Summer semester)** | | | | | | | |
| **Unit Tutor** | | Rawan Baniyounes, Mussab Al Huniati | | | | | | | |
| **Internal Verifier Name and Approval (Signature)** | | **Zaineh Yousef** | | | | **Approval Date:** | | | |
| **C:\Users\r.baniyounes\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\62ECFEE.tmp** | | | |  | | | |
| **Assignment number and Title** | | **1** | OptiCloud: Modular Cloud-Based Data Processing System | | | | | | |
| **Issue Date (1St Submission)** | | **13/8/2024** | | **Submission Date (1st Submission)** | | | **10/9/2024** | | |
| **Issue Date (2nd Submission)** | | **14/9/2024** | | **Completion Date (2nd Submission)** | | | **16/9/2024** | | |
| **Submission Format** | | | | | | | | | |
| **Submission:** Codes files, UML , Screenshots for outputs, design, word document at least 1000 words.  **Word file format:** use consistent style and formatting. Use Times New Roman Font type, with 12 points, and single spacing.Effectively use headings and paragraphs**.** Number any type of illustrations (figures and tables) and refer to them inside your document. Attach your written code inside the file.  **Authenticity**: Your proposed work should be authentic, and not copied from others. your answers have to relate to the vocational scenario and not generally. If you use ideas, quotes or data (such as diagrams) from books, journals or other sources, **you must reference your sources, using the Harvard style.** | | | | | | | | | |
| **Unit Learning Outcomes** | | | | | | | | | |
| **LO1** | Develop a modular application for the cloud using a fast development method | | | | | | | | |
| **LO2** | Test the modules of a cloud application based on a testing plan | | | | | | | | |
| **LO3** | Perform functional and acceptance testing of a completed modular application | | | | | | | | |
| **LO4** | Assess the effectiveness of formal testing processes for application development | | | | | | | | |
| Transferable skills and competencies developed | | | | | | | | | |
| * Engage in research activities, design and development, testing and problem solving. * Acquire fundamental knowledge and skills to design, develop and deploy a solution to the cloud * Proficiency in multiple programming languages (e.g., Java, C++). * Ability to design, implement, and manage databases. | | | | | | | | | |
| **Vocational scenario:** | | | | | | | | | |
| You have recently joined OptiCloud Solutions Inc., a leading company specializing in software solutions. The company is working on a project for ShopEase, a major online retailer, which requires the development of a scalable, modular data processing application. Your role at OptiCloud Solutions Inc. is to design, build, and test this application using a fast development methodology.  Focus on creating distinct modules for input, execution, and output, ensuring they can scale effectively. The application should handle large datasets efficiently. Testing is crucial: develop test plans for each module, perform unit, integration, system, and acceptance testing, and document your results. Ensure the application meets user needs through user acceptance testing. Throughout the process, document your work, reflect on your testing, and propose improvements to enhance the application.  لقد انضممت مؤخرًا إلى شركة OptiCloud Solutions Inc.، وهي شركة رائدة في تقديم حلول البرمجيات. الشركة تعمل على مشروع لشركة ShopEase، وهي بائع تجزئة كبير عبر الإنترنت، والذي يتطلب تطوير تطبيق لمعالجة البيانات القابلة للتوسع والتعديل. دورك في شركة OptiCloud Solutions Inc. هو تصميم وبناء واختبار هذا التطبيق باستخدام منهجية تطوير سريعة.  ركز على إنشاء وحدات متميزة للإدخال والتنفيذ والإخراج، مع التأكد من أنها يمكن أن تتوسع بشكل فعال. يجب أن يتعامل التطبيق مع مجموعات البيانات الكبيرة بكفاءة. الاختبار أمر حاسم: قم بتطوير خطط اختبار لكل وحدة، وأجرِ اختبارات الوحدة والتكامل والنظام والقبول، وسجل نتائجك. تأكد من أن التطبيق يلبي احتياجات المستخدم من خلال اختبار قبول المستخدم. طوال العملية، وثّق عملك، وقيّم اختبارك، واقترح تحسينات لتعزيز التطبيق. | | | | | | | | | |
| Assignment activity and guidance | | | | | | | | | |
| 1. **Activity 1:**   To develop a modular application for the cloud using a fast development method, you will first scheme a modular application suitable for cloud deployment, consisting of input, execution, and output modules. Build the individual modules according to the predetermined designs, ensuring each module is well-defined and can function independently within the cloud environment. Define appropriate test plans for each module in your modular application, covering all necessary scenarios and edge cases specific to cloud environments. Design and implement stub code to facilitate the independent testing of each module, and perform testing using the developed test plans, documenting the outcomes and any issues identified. Consolidate the modules into a single, complete application ensuring seamless interaction and full integration. Prepare and document a functional and acceptance testing plan, then implement the tests systematically to evaluate the application’s performance and functionality. Explore different testing and debugging methods, evaluate the quality of integration, and rationalize your choices of testing methods and test data. Critically evaluate the effectiveness of your testing and debugging processes throughout the development, and critique how these processes have enhanced your application development.   1. **Activity 2:**   In assessing the effectiveness of formal testing processes for application development, appraise the effectiveness of user acceptance testing and the outcomes of modular testing against the initial designs. Defend the necessity of a structured process when using a fast application development method. Suggest possible improvements for future projects based on your reflections on the testing and debugging processes.  **النشاط 1:**  لتطوير تطبيق معياري للحوسبة السحابية باستخدام طريقة تطوير سريعة، ستقوم أولاً بتخطيط تطبيق معياري مناسب للنشر السحابي، يتكون من وحدات الإدخال، التنفيذ، والإخراج. قم ببناء الوحدات الفردية وفقاً للتصاميم المحددة مسبقاً، مع ضمان أن تكون كل وحدة محددة جيداً وقادرة على العمل بشكل مستقل ضمن بيئة السحابة. قم بتحديد خطط اختبار مناسبة لكل وحدة في تطبيقك المعياري، مع تغطية جميع السيناريوهات والحالات المتطرفة اللازمة الخاصة ببيئات السحابة. قم بتصميم وتنفيذ كود مبدئي لتسهيل اختبار كل وحدة بشكل مستقل، وقم بتنفيذ الاختبارات باستخدام خطط الاختبار المطورة، مع توثيق النتائج وأي مشاكل تم تحديدها. قم بتجميع الوحدات في تطبيق كامل واحد يضمن التفاعل السلس والتكامل الكامل. قم بإعداد وتوثيق خطة اختبار وظيفي واختبار قبول، ثم قم بتنفيذ الاختبارات بشكل منهجي لتقييم أداء التطبيق ووظيفته. استكشف طرق اختبار وتصحيح الأخطاء المختلفة، قم بتقييم جودة التكامل، وبرر اختياراتك لطرق الاختبار وبيانات الاختبار . قيّم بشكل نقدي فعالية عمليات الاختبار وتصحيح الأخطاء الخاصة بك خلال التطوير، وانتقد كيف عززت هذه العمليات من تطوير تطبيقك .  **النشاط 2 :**  في تقييم فعالية العمليات الرسمية لاختبار تطوير التطبيقات، قم بتقييم فعالية اختبار قبول المستخدم ونتائج اختبار الوحدات مقارنةً بالتصاميم الأولية . دافع عن ضرورة اتباع عملية منظمة عند استخدام طريقة تطوير تطبيقات سريعة . اقترح تحسينات ممكنة للمشاريع المستقبلية بناءً على انعكاساتك على عمليات الاختبار وتصحيح الأخطاء . | | | | | | | | | |
| **Recommended Resources**  Please note that the resources listed are examples for you to use as a starting point in your research – the list is not definitive.  **Book**  BLACK R., WALSH M., COLEMAN G., CORNANGUER B., FORGÁCS I., KAKKONEN K., SABAK J. (2017).  Agile Testing Foundations: An ISTQB Foundation Level Agile Tester guide. UK: British Computer Society FISHPOOL B., FISHPOOL M. (2020).  Software Development in Practice. UK: British Computer Society FORGÁCS I., KOVÁCS A. (2019).  Practical Test Design: Selection of traditional and automated test design techniques. UK. British Computer Society HAMBLING B., MORGAN P., SAMAROO A., THOMPSON G, WILLIAMS P. (2019).  Software Testing, An ISTQB-BCS Certified Tester Foundation guide – 4th edition. UK: British Computer Society HAMBLING B., VAN GOETHEM P. (2013)  User Acceptance Testing: A step-by-step guide. UK: British Computer Society | | | | | | | | | |

**Learning Outcomes and Assessment Criteria**

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| Pass | Merit | Distinction |
| **LO1** Develop a modular application for the cloud using a fast development method | | **D1** Critically analyze the effectiveness of your testing and debugging as documented throughout the development process. |
| **P1** Design a modular application consisting of input, execution, output modules and test data, suitable for the cloud.  **P2** Build the modules of the application from predetermined modular designs. | **M1** Investigate the different methods of carrying out testing and debugging, and the conditions necessary for effective debugging of a modular application. |
| **LO2** Test the modules of a cloud application based on a testing plan | |
| **P3** Develop suitable test plans for each individual module of a modular application.  **P4** Create stub code to allow the effective individual testing of each module in a modular application.  **P5** Carry out testing on individual modules of a modular application using individual test plans | **M2** Review the outcomes of modular testing against the module designs. |
| **LO3** Perform functional and acceptance testing of a completed modular application | |  |
| **P6** Consolidate the modules developed into one complete application**.**  **P7** Plan suitable functional and acceptance testing for a completed modular application  **P8** perform functional and acceptance testing on a completed modular application | **M3** Justify the choice of testing methods and test data chosen to determine a modular application’s suitability for its intended purpose |
| **LO4** Assess the effectiveness of formal testing processes for application development | | **D2** Evaluate how the testing and debugging process has enhanced application development with your chosen methodology and suggest improvements |
| **P9** Assess how effective user acceptance testing can ensure an application is fit for purpose | **M4** Justify why a structured testing and debugging process is necessary when using a fast application development method |