**Unit 20: Applied Programming and Design Principles**

**Assignment part 2 Brief**

|  |  |
| --- | --- |
| **Programme Title** | **Pearson BTEC Level 5 Higher National Diploma in Computing** |
| Student Name/ID Number |  |
| **Unit Number and Title** | **Unit 20: Applied Programming and Design Principles** |
| Academic Year | 2024-2025 |
| Unit Tutor |  |
| **Assignment Title** | **Develop and test the application** |
| Issue Date | 1/5/2025 |
| Submission Date |  |
| **Submission Format** | |
| *Format:*   * This assignment is a group report. However, please read the following instructions carefully. * **A web application** specified in Activity 2 * **A report specified** in Activity 1, Activity 2, Activity 3 * **Each member can share ideas, but each member has to complete the report individually as well as implement some functions in the final application.** * You must use font *Calibri size 12, set number of the pages and use multiple line spacing at 1.5. Margins must be: left: 1.25 cm; right: 1 cm; top: 1 cm and bottom: 1 cm.* * You should use in text references and a list of all cited sources at the end of the essay by applying Harvard referencing style. * The recommended word limit is *2000-2500 words (+/-10%)*, excluding the tables, graphs, diagrams, appendixes and references. You will not be penalized for exceeding the total word limit. * The cover page of the report has to be the Assignment front sheet 2 (to be attached with this assignment brief).   *Submission:*   * Students are compulsory to submit the assignment in due date and in a way requested by the Tutor. * The form of submission will be a soft copy posted on <http://cms.btec.edu.vn/>. * Remember to convert the Word file into PDF file before the submission on CMS. Students are advised to use latex to write the assignment.   *Note:*   * The individual Assignment *must* be your own work, and not copied by or from another student or from anywhere. * 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.   Make sure that you understand and follow the guidelines to avoid plagiarism. Failure to comply this requirement will result in a failed assignment. | |
| **Unit Learning Outcomes** | |
| **LO3** Build a data processing application based on a developed design  **LO4** Perform automatic testing on a data processing application. | |
| **Transferable skills and competencies developed** | |
| Computing-related cognitive skills   * Demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to computing and computer applications * Use such knowledge and understanding in the modelling and design of computer-based systems for the purposes of comprehension, communication, prediction and the understanding of trade-offs * Recognise and analyse criteria and specifications appropriate to specific problems, and plan strategies for their solutions * Analyse the extent to which a computer-based system meets the criteria defined for its current use and future development * Deploy appropriate theory, practices and tools for the design, implementation and evaluation of computer-based systems.   Computing-related practical skills   * The ability to evaluate systems in terms of quality attributes and possible trade-offs presented within the given problem * The ability to plan and manage projects to deliver computing systems within constraints of requirements, timescale and budget * The ability to recognise any risks and safety aspects that may be involved in the deployment of computing systems within a given context * The ability to deploy effectively the tools used for the construction and documentation of computer applications, with particular emphasis on understanding the whole process involved in the effective deployment of computers to solve practical problems * The ability to critically evaluate and analyse complex problems, including those with incomplete information, and devise appropriate solutions, within the constraints of a budget.   Generic skills for employability   * Intellectual skills: critical thinking; making a case; numeracy and literacy * Self-management: self-awareness and reflection; goal setting and action planning, independence and adaptability; acting on initiative; innovation and creativity   Contextual awareness, e.g. the ability to understand and meet the needs of individuals, business and the community, and to understand how workplaces and organisations are governed. | |
| **Vocational scenario** | |
| Continue with the scenario stated in the first assignment. | |
| **Assignment activity and guidance** | |
| **Activity 1**  Examine and discussion different test methods of implementing automatic testing can be done for the SIMS application. Example, unit testing, integration testing..  (Approximately 400 words)  **Activity 2**  Build a data processing application with automating testing based on a developed design in the first assignment.  Implement automatic testing of the developed application.  Discuss the differences between developer- produced and vendor- provided automatic testing tools for applications and software systems  Provide screenshots for the implemented applications and show how many tests have passed  **Activity 3**  In this task, you will reflect on the developed program by considering various aspects of SOLID principles, including maintainability, testability, readability, and flexibility.   * Assess the effectiveness of using SOLID principles, clean coding techniques and programming patterns on the application developed * Analyse the benefits and drawbacks of different forms of automatic testing of applications and software systems, with examples from the developed application   (Approximately 500 words) | |
| **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.** | |

**Learning Outcomes and Assessment Criteria**

|  |  |  |
| --- | --- | --- |
| **Pass** | **Merit** | **Distinction** |
| **LO3** Build a data processing application based on a developed design | |  |
| **P5** Build a large dataset processing application based on the design produced. | **M3** Assess the effectiveness of using SOLID principles, clean coding techniques and programming patterns on the application developed. | **LO3 and LO4**  D2 Analyse the benefits and drawbacks of different forms of automatic testing of applications and software systems, with examples from the developed application. |
| **LO4** Perform automatic testing on a data processing application | |
| **P6** Examine the different methods of implementing automatic testing as designed in the test plan.(làm trước)(lí thuyết)  **P7** Implement automatic testing of the developed application. | **M4** Discuss the differences between developer- produced and vendor- provided automatic testing tools for applications and software systems.(làm trước, lí thuyết) |