Unit 1: Programming

Assignment Brief

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| Student Name/ID Number |  |
| Unit Number and Title | Unit 1: Programming |
| Academic Year | 2023-2024 |
| Unit Tutor |  |
| Assignment Title | Application development with IDE |
| Issue Date |  |
| Submission Date |  |
| Submission Format | |
| *Format:* This submission will have 3 components   1. Written report: The submission is in the form of an individual written report. This should be written in a concise, formal business style using single spacing and font size 12. You are required to make use of headings, paragraphs and subsections as appropriate, and all work must be supported with research and referenced using the Harvard referencing system. Please also provide a bibliography using the Harvard referencing system.   With the submitted system student should do a presentation to demonstrate the system that was  developed. Time allocated is 10 to 15 min. Student may use 5 to 10 PowerPoint slides while doing the  presentation, but live demonstration of the system is required.  With the submitted system student should do a presentation to demonstrate the system that was  developed. Time allocated is 10 to 15 min. Student may use 5 to 10 PowerPoint slides while doing the  presentation, but live demonstration of the system is required.   1. Implemented System (Software): The student should submit a system developed using an IDE. Implemented program in format suitable to be run and assessed for functionality – this could be as project/solution files or final compiled executable. 2. Presentation : With submitted system, student should do a presentation to demonstrate the system that was developed. Time allocated is 10 to 15 minutes.   *Submission:* Students are compulsory to submit the assignment in due date and in a way requested by the Tutors. The form of report and presentation will be a soft copy in PDF posted on corresponding course of <http://cms.btec.edu.vn/>  *Note:* The Assignment *must* be your own work, and not copied by or from another student or from books etc. 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 know how to reference properly, and that you understand the guidelines on plagiarism. *If you do not, you definitely get fail* | |
| Unit Learning Outcomes | |
| LO1 Define basic algorithms to carry out an operation and outline the process of programming an application  LO2 Explain the characteristics of procedural, object-orientated and event-driven programming  LO3 Implement basic algorithms in code using an IDE  LO4 Determine the debugging process and explain the importance of a coding standard. | |
| Transferable skills and competencies developed | |
| Computing-related cognitive skills   * Computational thinking (including its relevance to everyday life) * Demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to computing and computer applications * Recognise and analyse criteria and specifications appropriate to specific problems, and plan strategies for their solutions * Critical evaluation and testing: analyse the extent to which a computer-based system meets the criteria defined for its current use and future development * Methods and tools: deploy appropriate theory, practices and tools for the design, implementation and evaluation of computer-based systems.   Computing-related practical skills   * The ability to specify, design and construct reliable, secure and usable computer-based systems * The ability to evaluate systems in terms of quality attributes and possible trade-offs presented within the given problem * 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** | |
| Now the research and development team you work with have been tasked with further investigation into how best to build more efficient, secure software for calculate water bill. You have been asked to look into programming paradigms and the advantages and disadvantages of using different programming language approaches.  You will need to create a report covering findings from research into the characteristics of different programming paradigms – procedural, object-orientated and event-driven programming. After that, you and your team are given a more challenging task to create a fully working, secure application that has been developed using an IDE and adheres to coding standards for a detailed business problem. | |
| Assignment activity and guidance | |
| **Activity 2**  Produce a formal report that explores the features and characteristics of the three different programming paradigms – Event Driven, Object Oriented and Procedural.  Your report should include:   * a brief explanation about what the selected application is and what it does * a general discussion of the three code paradigms, with specific reference to their characteristics and how each one is related * a comparison of how the three programming paradigms have been used in the given application source code * a critical evaluation of how the source code implements all three paradigms in terms of code structure and characteristics.   *(Word limit: 500 – 1000 words)*  **Activity 3**  You are required to develop a program that makes use of appropriate algorithms to fulfil the given client requirements. You should make use of whichever tools and techniques are most appropriate for your chosen coding paradigm and for the nature of the software solution. You are asked to make a presentation that details the process that would be required to design the algorithm for the solution and how you turned the algorithm into a working application. Your presentation should include the following.   * A definition, written in the design tool of your choosing, of the algorithm required for the implementation of your program. * An outline of the steps required to build the application * An explanation of the debugging features available in your chosen IDE * Debugging any errors in the program * An explanation of the coding standards you used in your source code * A description of the steps required for converting the algorithm into a working program, including identification of a suitable programming language * An analysis of the relationship between the algorithm and program code to be produced (e.g. parts of the algorithm that would remain the same, changes that would have to be made) * An analysis of the possible challenges you would face when converting the designed algorithm into program code (e.g. data types/structures available in the chosen language, control structures required) * an examination of how the debugging process can be used to develop more secure and robust applications * using version control within your IDE to track and monitor changes in the algorithm * using performance monitoring tools to optimise the algorithm * Evaluate the role and purpose of a coding standard and why it is necessary in a team as well as for the individual.   *( Slide limit: 15-20 slides)* | |
| **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.**  HN Global HN Global HN Global (2021) Reading Lists. Available at: [https://hnglobal.highernationals.com/learning-zone/reading-lists](https://hnglobal.highernationals.com/learning-zone/reading-lists%20)  HN Global (2021) Student Resource Library. Available at: <https://hnglobal.highernationals.com/subjects/resource-libraries>  HN Global (2021) Textbooks. Available at:  <https://hnglobal.highernationals.com/textbooks> | |

**Learning Outcomes and Assessment Criteria**

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| Pass | Merit | | Distinction |
| **LO2** Explain the characteristics of procedural, object-oriented and event-driven programming | | | **D2** Critically evaluate the source code of an application that implements the procedural, object-orientated and event-driven paradigms, in terms of the code structure and characteristics. |
| **P3** Discuss what procedural, object-orientated and event-driven paradigms are; their characteristics and the relationship between them | **M2** Compare the procedural, object-orientated and event-driven paradigms used in given source code of an application. | |
| **LO3** Implement basic algorithms in code using an IDE | | | **D3** Evaluate the use of an IDE for development of applications contrasted with not using an IDE. |
| **P4** Write a program that implements an algorithm using an IDE | **M3** Enhance the algorithm written, using the features of the IDE to manage the development process. | |
| **LO4** Determine the debugging process and explain the importance of a coding standard | | | **D4** Evaluate the role and purpose of a coding standard and why it is necessary in a team as well as for the individual. |
| **P5** Explain the debugging process and explain the debugging facilities available in the IDE.  **P6** Explain the coding standard you have used in your code | | **M4** Examine how the debugging process can be used to help develop more secure, robust applications. |