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| Pearson  Higher Nationals in | | |
| Computing | | |
| EXAMPLE ASSESSMENT BRIEF | | |
| Unit: | 19 Data Structures & Algorithms | |
| For use with the Higher National Certificate and  Higher National Diploma in Computing | | |
| Brief Number: | | 1 |
| First teaching from September 2017 | | |
| **Issue** | **1** | |



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Higher National Certificate/Diploma in

Computing

Example Assessment Brief

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| Student Name/ID Number |  |
| **Unit Number and Title** | **19: Data Structures & Algorithms** |
| Academic Year |  |
| Unit Tutor |  |
| **Assignment Title** | **Softnet Development Ltd** |
| **Issue Date** |  |
| Submission Date |  |
| IV Name & Date |  |

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| **Submission Format** |
| The submission is in the form of two documents:  Part 1: A ten-minute Microsoft® PowerPoint® style presentation to be presented to your colleagues. The presentation can include links to performance data with additional speaker notes and a bibliography using the Harvard referencing system. The presentation slides for the findings should be submitted with speaker notes as one copy. You are required to make effective use of headings, bullet points and subsections as appropriate. Your research should be referenced using the Harvard referencing system. The recommended word limit is 500 words, including speaker notes, although you will not be penalised for exceeding the total word limit.  Part 2: A formal individual written report (saved in either a Microsoft® Word® or PDF format). 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. The recommended word limit is 2,000–2,500 words, although you will not be penalised for exceeding the total word limit. |

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| **Unit Learning Outcomes** |
| **LO1** Examine abstract data types, concrete data structures and algorithms.  **LO2** Specify abstract data types and algorithms in a formal notation. |
| **Assignment Brief and Guidance** |
| \*Please note that assignment guidance is for reference only and should be more specific in detail to meet customised needs.  You work as in-house software developer for Softnet Development Ltd, a software body-shop providing network provisioning solutions. Your company is part of a collaborative service provisioning development project and your company has won the contract to design and develop a middleware solution that will interface at the front-end to multiple computer provisioning interfaces including SOAP, HTTP, JML and CLI, and the back-end telecom provisioning network via CLI .  Your account manager has made you technical project leader and your role is to inform them about designing and implementing abstract data types. You have been asked to create a presentation for all collaborating partners on how ADTs can be utilised to improve software design, development and testing. Further, you have been asked to write an introductory report for distribution to all partners on how to specify abstract data types and algorithms in a formal notation.  **Part 1**  You will need to prepare a presentation on how to create a design specification for data structures, explaining the valid operations that can be carried out on the structures using the example of:   1. A stack ADT, a concrete data structure for a First In First out (FIFO) queue. 2. Two sorting algorithms. 3. Two network shortest path algorithms.   **Part 2**  You will need to provide a formal written report that includes the following:   1. Explanation on how to specify an abstract data type using the example of software stack. 2. Explanation of the advantages of encapsulation and information hiding when using an ADT. 3. Discussion of imperative ADTs with regard to object orientation.   *Please review the subsequent grading criteria for more details on the expected elements and topics that need to be included.*  \*Please access HN Global for additional resources support and reading for this unit. For further guidance and support on report writing please refer to the Study Skills Unit on HN Global. Link to www.highernationals.com |

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| Learning Outcomes and Assessment Criteria | | |
| Pass | Merit | Distinction |
| **LO1** Examine abstract data types, concrete data structures and algorithms | | **D1** Analyse the operation, using illustrations, of two network shortest path algorithms, providing an example of each. |
| **P1** Create a design specification for data structures explaining the valid operations that can be carried out on the structures.  **P2** Determine the operations of a memory stack and how it is used to implement function calls in a computer. | **M1** Illustrate, with an example, a concrete data structure for a First In First out (FIFO) queue.  M2 Compare the performance of two sorting algorithms. |
| **LO2** Specify abstract data types and algorithms in a formal notation | | **D2** Discuss the view that imperative ADTs are a basis for object orientation and, with justification, state whether you agree. |
| **P3** Using an imperative definition, specify the abstract data type for a software stack. | **M3** Examine the advantages of encapsulation and information hiding when using an ADT. |