



ASSESSMENT BRIEF

COURSE: Bachelor of IT	
Unit Code:	DSAA204
Unit Title:	Data Structure and Algorithms
Type of Assessment:	Assessment 3- Individual Report
Length/Duration:	Word limit- 2000 words
Unit Learning Outcomes addressed:	<ul style="list-style-type: none">a) Evaluate the efficiency and effectiveness of data structures and algorithms;b) Demonstrate reasoning about efficiency of algorithms;c) Assess and apply suitable recursive data structures and algorithms to IT systems and applications.
Submission Date:	To be submitted in week 11
Assessment Task:	The assessment is about a design of a system using OOP.
Total Mark:	20 Marks
Weighting:	20%
<p>Students are advised that submission of an Assessment Task past the due date without a formally signed approved Assignment Extension Form (Kent Website MyKent Student Link> FORM – Assignment Extension Application Form – Student Login Required) or previously approved application for other extenuating circumstances impacting course of study, incurs a 5% penalty per calendar day, calculated by deduction from the <u>total mark</u>.</p> <p>For example. An Assessment Task marked out of 40 will incur a 2 mark penalty <u>for each calendar day</u>.</p> <p>More information, please refer to (Kent Website MyKent Student Link> POLICY – Assessment Policy & Procedures – Student Login Required)</p>	

ASSESSMENT DESCRIPTION:

This assessment is an individual report about the design of an OOP system using Data Structures and Algorithms. The report should follow the following structure using the actual case study that will be available on Moodle (in assessment section) by week 8.

1. Title Page
2. Executive Summary
3. Introduction
4. Background
5. Case Study and the Design
 - 5.1 Variables, Ranges and Keys
 - 5.2 Operations and the Justification
 - 5.3 Algorithms and the Justification
 - 5.4 Modifications
6. Conclusion
7. References

CASE STUDY:

Developing a Fraud Detection System for a Financial Institution

Introduction: In Australia, a large financial institution wants to improve its fraud detection capabilities by implementing a new fraud detection system. The system will use data from various sources, including transactions, customer profiles, and external data sources, to identify and prevent fraudulent activities. The financial institution wants to ensure that the system is efficient, accurate, and easy to use.

Problem Statement: The financial institution wants to develop a fraud detection system that meets the following requirements:

1. **Technical Complexity:** The system should be able to process large amounts of data from various sources in real-time and use advanced algorithms to identify fraudulent activities.
2. **Data Complexity:** The system should be able to handle data from different sources with varying formats, structures, and levels of complexity. The system should also be able to integrate data from external sources, such as third-party data providers.
3. **Process Complexity:** The system should be able to identify and prevent fraudulent activities in a timely manner and coordinate with other systems, such as the customer support system, to resolve fraud cases. The system should also be able to comply with relevant regulations and standards.
4. **Integration Complexity:** The system should be able to integrate with the financial institution's existing systems, such as the customer relationship management (CRM) system and the transaction processing system. The system should also be able to share data with other systems, such as the anti-money laundering (AML) system.
5. **User Complexity:** The system should be easy to use and should provide a user-friendly interface for fraud analysts to access the fraud detection data and manage fraud cases. The system should also provide training and support for fraud analysts to effectively use the system.
6. **Project Complexity:** The project should be managed effectively and efficiently, considering the technical, data, process, integration, and user complexities. The project should also consider the risk involved and have contingency plans in place.

The fraud detection system is a complex computing problem that requires a deep understanding of data structure and algorithms. By considering the criteria outlined by the Australian Computer Society, the financial institution can ensure that it has a comprehensive understanding of the complexity of the problem and can

implement a solution that meets its requirements and provides the desired outcomes. The solution will likely require the use of advanced data structures, such as graph databases and machine learning algorithms, to effectively analyze the large amounts of data and identify fraudulent activities. Research should be conducted to get some ideas about the graph database and ML.

TASKS TO BE COMPLETED

Given the above information:

- Decide the appropriate variables, keys and ranges to be used in the system. Justify.
- Identify the appropriate data structure to represent this problem.
- The operations that fraud detection system should support.
- Algorithms for the operations that your system should support. Also, justify the choice of algorithms.
- Discuss the scalability of the system and propose potential improvements to handle larger fraud detection capacities and increased fraudulent activities.
- Reflect on the challenges and limitations of the design and propose additional features or enhancements that could further improve the fraud detection system.

ASSESSMENT SUBMISSION:

The assignment must be submitted online in Moodle. All materials MUST be submitted electronically in Microsoft Word format. Other formats (e.g., pdf or MAC file) may not be readable by markers. Please be aware that any assessments submitted in other formats will be considered LATE and will lose marks until it is presented in MS Word. No paper based or hardcopy submission will be accepted.

MARKING GUIDE (RUBRIC):

Marking Criteria	Fail (0- 9.8)	Pass (10 - 12.8)	Credit (13 -14.8)	Distinction (15- 16.8)	High Distinction (17- 20)
Specification of K/V/R with justification /20	Little or no specification of keys, values and ranges with no justification is given.	Only one out of three (K/V/R) are specified with no or little justification provided.	Only two out of three (K/V/R) are specified with no or little justification provided.	Only two out of three (K/V/R) are specified with right justifications.	All keys, values and ranges are clearly specified and supported by right arguments.
Operations /20	No operations are specified that are required for proper functioning of the system. Some rudimentary/un-necessary operations are specified which are not crucial for the functioning of the system.	Minimal operations are specified that are essential for the working of the system.	50% of operations that are crucial for working of the system are provided.	75% of operations that are crucial for working of the system are provided. Some of the reasons that justify the need of these operations are also specified.	A complete list of operations is provided that makes system functional and operational. Reasons for the need of those operations are also provided.
Choice of algorithms with Justification /30	No algorithm is specified for listed operations. If there is some algorithm mentioned, it is not supported by the right arguments as to why	Algorithms for majority of the operations are specified. However, there is no justification provided	Algorithms for majority of the operations are specified. Justifications are given but the arguments show a	Algorithms for majority of the operations are specified. Student has knowledge of some of the properties of algorithms. However,	Algorithms for all of the operations are specified. The justification shows a sound knowledge of the different properties of algorithms. The

	the said algorithm is best suited to the operation.	for the choice of algorithms.	lack of description for different properties of algorithms.	he fails to choose the right algorithm for some of the operations.	capability for choosing the right algorithm for any operation is shown.
	Fail (0- 5.4)	Pass (5- 6.4)	Credit (6.5- 7.4)	Distinction (7.5- 8.4)	High Distinction (8.5- 10)
Modifications /10	No comments or superficial comments are provided on the modified system.	The change in requirements has been recognized but a decision about modifications has not been made.	The change in requirements is recognized but the modifications suggested are not related to key data structures or algorithms.	The change in requirements is recognized and modifications are suggested. The arguments given in support of modifications, or no modifications are little or have minor issues.	The change in requirements is recognized and modifications are suggested. The arguments given in support of modifications, or no modifications are comprehensive and accurate.
	Fail (0- 5.4)	Pass (5- 6.4)	Credit (6.5- 7.4)	Distinction (7.5- 8.4)	High Distinction (8.5- 10)
Language and presentation /10	Poor standard of writing. Word limit may not be adhered to.	Basic and sound standard of writing; some errors in punctuation, grammar and spelling	Good standard of writing; few errors in punctuation, grammar and spelling.	Very good standard of writing; very few or minor errors in punctuation, grammar and spelling.	Professional standard of writing; no errors in punctuation, grammar and spelling.
	Fail (0- 5.4)	Pass (5- 6.4)	Credit (6.5- 7.4)	Distinction (7.5- 8.4)	High Distinction (8.5- 10)
Structure and referencing /10	No referencing is evident or, if done, is inconsistent and technically incorrect. No or minimal reference list, mixed styles. No in text citations	Basic and sound attempt to reference sources; may be some inconsistencies and technical errors in style. Reference list is generally complete with 1 or 2 references missing.	Good attempt to reference sources, inconsistencies and technical errors in style. Few inaccuracies in reference list and all references listed.	Very good attempt to reference sources, very minor inconsistencies and technical errors in style. Thorough and consistent reference list and all references listed.	Professional level of referencing and acknowledgment; no errors of style evident. Thorough and consistent reference list and all references listed.

GENERAL NOTES FOR ASSESSMENT TASKS

Content for Assessment Task papers should incorporate a formal introduction, main points and conclusion.

Appropriate academic writing and referencing are inevitable academic skills that you must develop and demonstrate in work being presented for assessment. The content of high-quality work presented by a student must be fully referenced within-text citations and a Reference List at the end. Kent strongly recommends you refer to the Academic Learning Support Workshop materials available on the Kent Learning Management System (Moodle). For details please click the link <http://moodle.kent.edu.au/kentmoodle/mod/folder/view.php?id=3606> and download the file titled "Harvard Referencing Workbook". This Moodle Site is the location for Workbooks and information that are presented to Kent Students in the ALS Workshops conducted at the beginning of each Trimester.

Kent recommends a minimum of **FIVE (5)** references in work being presented for assessment. Unless otherwise specifically instructed by your Lecturer or as detailed in the Unit Outline for the specific Assessment Task, any paper with less than five (5) references may be deemed not meeting a satisfactory standard and possibly be failed.

Content in Assessment tasks that includes sources that are not properly referenced according to the "Harvard Referencing Workbook" will be penalised.

Marks will be deducted for failure to adhere to the word count if this is specifically stated for the Assessment Task in the Unit Outline. As a general rule there is an allowable discretionary variance to the word count in that it is generally accepted that a student may go over or under by 10% than the stated length.

GENERAL NOTES FOR REFERENCING

References are assessed for their quality. Students should draw on quality academic sources, such as books, chapters from edited books, journals etc. The textbook for the Unit of study can be used as a reference, but not the Lecturer Notes. The Assessor will want to see evidence that a student is capable of conducting their own research. Also, in order to help Assessors determine a student's understanding of the work they cite, all in-text references (not just direct quotes) must include the specific page number(s) if shown in the original. Before preparing your Assessment Task or own contribution, please review this 'YouTube' video (Avoiding Plagiarism through Referencing) by clicking on the following link: link:

<http://moodle.kent.edu.au/kentmoodle/mod/folder/view.php?id=3606>

A search for peer-reviewed journal articles may also assist students. These type of journal articles can be located in the online journal databases and can be accessed from the Kent Library homepage. Wikipedia, online dictionaries and online encyclopaedias are acceptable as a starting point to gain knowledge about a topic, but should not be over-used – these should constitute no more than 10% of your total list of references/sources. Additional information and literature can be used where these are produced by legitimate sources, such as government departments, research institutes such as the National Health and Medical Research Council (NHMRC), or international organisations such as the World Health Organisation (WHO). Legitimate organisations and government departments produce peer reviewed reports and articles and are therefore very useful and mostly very current. The content of the following link explains why it is not acceptable to use non-peer reviewed websites (Why can't I just Google?): <https://www.youtube.com/watch?v=N39mnu1Pkgw>
_ (thank you to La Trobe University for access to this video).