Assessment Brief

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Module Title: **Algorithms and Data Structures**
Module Code: **502IT**

Assessment Type: Coursework	Assessment Number: 1	Study Mode: Full-time & Part-time	Weighting: PSB202IT 50% PSB502IT 10 Credits
Submission Date: **28/01/2023**	Submission Time: 20:00	Campus: STEM, PSB Academy	

Introduction:
In this assessment, you will create a solution for the analysis and design of a real-world scenario using object-oriented modelling tools. The scenario should be based on case study given below. This showcases evidence of your ability to deconstruct a range of complex problems and showcase your approach using various modelling tools.

Completion of this assignment will address the following learning outcomes:	
1	Select and develop algorithms to solve a range of complex problems.
2	Apply object-oriented analysis and design techniques to develop software with multiple component parts.
3	Evaluate common algorithms and data structures.

Task:
You are to create a technical solution for the analysis and design of a real-world scenario using object-oriented modelling tools (such as UML 2.0). All design decision must be supported by justification and rational in relation to the analysis outcome.

The scenario should be based on case study given below:

The solution will include supporting evidence, such as code snippets and diagrams with accompanying textual justifications.

The final report must include and not more than 10 pages in total:
  • Introduction & Problem Analysis
  • UML Class Diagram
  • Code to test the program with appropriate test cases
  • Indicative Learning Summary Report which mapping the intended module learning outcomes and topic under discussion. Learners are to exhibit how these topics was being applied to solve the case study.
  • List of reference

You are advice to provide proper caption for each diagram or figure included in your report and elaborate the diagram. |

Case Study:

In this assignment, you will design various classes and write a program to computerize the billing system of a hospital.

a. Create a Person class with first name and last name as data members. Add appropriate constructors and member functions to initialize, access, and manipulate the data members.

Design the class Doctor, inherited from the class Person, with an additional data member to store a doctor's specialization. Add appropriate constructors and member functions to initialize, access, and manipulate the data members.

b. Design the class HospitalBill with data members to store a patient's ID and a patient's hospital charges, such as pharmacy charges for medicine, doctor's fee, and room charges. Add appropriate constructors and member functions to initialize, access, and manipulate the data members.

c. Design the class Patient, inherited from the class Person, with additional data members to store a patient's ID, age, date of birth, attending physician's name, the date when the patient was admitted in the hospital, and the date when the patient was discharged from the hospital. (Use the

class DateType to store the date of birth, admit date, discharge date. The class Doctor stores the attending physician's name. So put some thinking into the relationships.) Add appropriate constructors and member functions to initialize, access, and manipulate the data members.

Write a program to test your classes.

Guidance notes and considerations

Late Submission

- If you are not able to complete your coursework on time due to extenuating circumstances, the ONLY way to receive an extension (up to 5 working days) or a deferral (anything longer than 5 working days) is to contact your module lecturer or Email to CU_ENG@psb-academy.edu.sg

- Extenuating circumstances are defined by CU as 'genuine circumstances beyond your control or ability to foresee, and which seriously impair your assessed work'.

- Please note that you will need to provide third party evidence to support your reasoning for requiring an extension or deferral.

Plagiarism and Malpractice

- You are encouraged to check the originality of your work by using the draft Turnitin links on your Blackboard.

- Collusion between students (where sections of your work are similar to the work submitted by other students in this or previous module cohorts) is taken extremely seriously and will be reported to the academic conduct panel. This applies to all coursework and exam answers.

- A marked difference between your writing style, knowledge and skill level demonstrated in class discussion, any test conditions and that demonstrated in a coursework assignment may result in you having to undertake a Viva Voce in order to prove the coursework assignment is entirely your own work.

- If you make use of the services of a proof reader in your work you must keep your original version and make it available as a demonstration of your written efforts.

- You must not submit work for assessment that you have already submitted (partially or in full), either for your current course or for another qualification of this university, unless this is specifically provided for in your assignment brief or specific course or module information.

- Where earlier work by you is citable, i.e., it has already been published/submitted, you must reference it clearly. Identical pieces of work submitted concurrently will also be considered to be self-plagiarism.

Submission Guidelines

There should be a title page which clearly identifies the following:

* Name of the module   * Title of the Assessment

* Assessment number   * Word count

The word count identified includes quotations, but excludes the bibliography and unless specifically stated, encompasses a discrepancy of + or – 10%.

Banding	Knowledge and Understanding (30%)	Analysis, Interpretation and Application of Theory (30%)	Quality of Research (20%)	Academic Writing (20%)
90-100%	Exceptional knowledge base exploring, analysing and evaluating the discipline and its theory with extraordinary originality and autonomy.	Demonstrates an exceptional grasp of relevant analytical techniques, and the ability to apply these to new and/or abstract information and situations. Shows a highly developed appreciation of the limits and/or appropriate uses of particular analytical and evaluative approaches. Knowledge and understanding of theory, where relevant, is highly detailed. Exceptional appreciation of the limits of theory demonstrated throughout all assessment outcomes. Approach to assessment task is theoretically informed to an exceptional standard.	Exceptional exploration of wider academic sources with a high degree of independent learning which exceeds the assessment brief. Sources have been accurately interpreted and integrated with flawless synthesis, leading to innovative and interesting ideas. With some adjustments, work may be considered for internal publication.	Exceptional answer with coherent and logical presentation of ideas. The answer exhibits a clear argument/line of reasoning with flair and originality. Discipline specific vocabulary used with precision and academic style applied well throughout. No language errors present and referencing in the CU version of Harvard has been employed in an accurate manner. With some adjustments, work may be considered for internal publication.
80-89%	Outstanding knowledge base exploring, analysing and evaluating the discipline and its theory with clear originality and autonomy.	Demonstrates an outstanding grasp of relevant analytical and/or evaluative techniques. Shows a developed appreciation of the limits and/or appropriate uses of particular analytical and/or evaluative approaches. Knowledge and understanding of theory, where relevant, is detailed and sophisticated. Appreciation of the limits of theory demonstrated throughout the work. Approach to assessment task is clearly and appropriately theoretically informed.	Outstanding exploration of wider academic sources with a high degree of independent learning which exceeds the assignment brief. Sources have been accurately interpreted and integrated with a high degree of synthesis, leading to innovative and interesting ideas.	Outstanding answer with coherent and logical presentation of ideas. The answer exhibits a clear argument/line of reasoning with flair and originality. Discipline specific vocabulary used with precision and academic style applied throughout. No language errors present. Referencing in the CU version of Harvard has been employed in an accurate manner.

70-79%	Excellent knowledge base that supports analysis and/or evaluation and problem-solving in theory and/or practice within the discipline, with considerable originality.	Demonstrates a detailed, accurate, theoretical understanding. Appropriately selected theoretical knowledge is applied to the individual learning outcomes. Makes excellent use of established techniques of analysis and/or evaluation relevant to the discipline and applies these effectively. Shows developed ability to appraise alternative theories and/or analytic approaches, where relevant.	Excellent exploration of wider academic sources with evidence of independent learning which may exceed the assignment brief. Sources have been accurately interpreted and integrated with an attempt made at synthesis, leading to interesting ideas.	Excellent answer with coherent and logical presentation of ideas. The answer is entirely relevant and focused with a clear argument/line of reasoning throughout. Discipline specific vocabulary used with precision and academic writing style applied throughout. No language errors present. Referencing in the CU version of Harvard has been employed in an accurate manner.
60-69%	Very good knowledge base that supports analysis and/or evaluation and problem-solving in theory and/or practice within the discipline, with some originality displayed.	Makes very good use of established techniques of analysis and/or evaluation relevant to the discipline. Shows developing ability to compare alternative theories and/or analytic approaches, where relevant.	Very good evidence of wider academic reading and independent learning. Sources have been accurately interpreted and integrated with some evidence of synthesis.	Very good answer with coherent and logical presentation of ideas. The answer is relevant and focused. Discipline specific vocabulary is used and academic writing style applied. Minimal language errors may be present but do not impact on clarity of expression. Referencing in the CU version of Harvard is accurate.
50-59%	Good knowledge base that supports some analysis and/or evaluation and problem-solving in theory and/or practice within the discipline.	Makes good use of established techniques of analysis and/or evaluation, relevant to the discipline. Sound descriptive knowledge of key theories with some appropriate application.	Good evidence of academic reading, with attempt at moving beyond the recommended texts. Interpretation of sources is acceptable with evidence of integration.	Good answer with coherent and logical presentation. The answer is largely relevant but lacks focus at points. There is an attempt at using discipline specific vocabulary and academic writing style. Some language errors are present which impacts on clarity at times. Referencing in the CU version of Harvard is mostly accurate.

40-49%	Satisfactory knowledge base demonstrating comprehension and formulation of basic knowledge with some omissions at the level of theoretical understanding. Limited ability to discuss theory and solve problems within the discipline.	Makes satisfactory but limited use of established techniques of analysis and/or evaluation, relevant to the discipline. Selection of theory, if relevant to the assessment outcomes is satisfactory but application and/or understanding is limited.	Satisfactory evidence of academic reading, with minimal attempt to move beyond the recommended texts. Interpretation of sources is acceptable, but there may be some instances of misunderstanding.	Satisfactory answer with some attempt at coherence and logical presentation. The answer contains some irrelevant material and lacks focus at points. There is minimal use of discipline specific vocabulary and academic writing style is inconsistently applied. Some language errors may be present which impacts on clarity at times. Referencing in the CU version of Harvard is mostly accurate but with some errors.
35-39% (Marginal Fail)	Outcomes not or only partially met. Restricted knowledge base demonstrated. Limited understanding of discipline. Difficulty with linking theory and problem solving within the discipline.	Attempts at analysis and/or evaluation ineffective and/or uninformed by the discipline. Knowledge of theory inaccurate and/or incomplete. Choice of theory inappropriate. Application and/or understanding very limited.	Limited evidence of reading at an academic level. Sources used may be inappropriate and interpreted poorly. Little evidence of integration.	Answer is attempted but limited. Lack of coherence and logical presentation. The answer contains mainly irrelevant material and lacks focus throughout. Language errors are present and impact on clarity of expression. Academic writing style is not adhered to. Referencing in the CU version of Harvard is inconsistent.
0 – 34%	Little or no evidence of knowledge base. Little evidence of understanding of discipline. Significant difficulty with theory and problem solving within the discipline.	Absence of relevant theoretical content and/or use of theory, where relevant. Lacks any analysis and/or evaluation.	Inadequate or no evidence of reading at an academic level with poor application of sources and ideas. Answer is likely to include inappropriate references which are misunderstood and not integrated. Possibility of plagiarism OR no evidence of academic research. Answer may not be research based.	Answer is inadequate with serious flaws in coherence and presentation. Poorly structured with multiple language errors which impact on clarity. Weak application of CU version of Harvard referencing style.