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|  | BACS2063 Data Structures and Algorithms  **ASSIGNMENT SPECIFICATION 202205** |

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# Introduction

Abstract data types (ADTs) are very important as they serve as programming tools that enable component reuse and encapsulation. This assignment requires students to create, implement and apply ***collection ADTs*** in an application. You may do this assignment on an individual basis or in a team of up to 5 members from the same practical class. Team assignments will normally provide a greater degree of appreciation of how various collection ADTs may be used within an application as well as the interdependence of various functionalities and features on the collection ADTs, if all members do their respective parts in a timely and responsible manner. Note that each student will be *individually-assessed based* on the quality and scope of work completed by him/her even if they do this as a team assignment.

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# Learning Outcomes Assessed

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| **CLO** | **Description** | **% to Coursework** |
| **CLO2** | Produce a software program using appropriate data structures and algorithms (P4, PLO3). | 85%\* |
| **CLO3** | Explain the implementation and appropriateness of data structures for a specific scenario (A4, PLO5). | 15% |

# \*Important: Students are required to obtain a pass mark for CLO2 (i.e., ≥ 42.5/85 marks for CLO2) in order to pass the coursework.

# Problem Statement

There are various applications that have become more useful due to restrictions of movement in recent times. These include applications that provide social interactions and activities, support group buying, or organization of resources for the needy.

You are required to select one of the following applications

1. Catering (meal) Services
2. Government or Clinic Services
3. Job Recruitment or Internship Placement (University/College) service

and develop a prototype\*\* that implements some of the functionalities of your chosen application to demonstrate your appreciation and mastery of collection ADTs.

\*\*Notes:

* The user interface for your application may be console-based, GUI-based or web-based. Note that no marks will be given for the type of user interface. However, the user interface should be easy to understand.
* You need not implement a complete system.
* Only validations related to the use collection ADTs are required.

# Scope of Work

Each student should be responsible for:

1. The specification and implementation of one collection ADT;
2. The implementation of one entity class which includes a collection of entity objects as one of its data fields;
3. The design and implementation of one or more client classes that includes
   1. at least one collection of entity objects as one of its data fields, and
   2. methods which manipulate the collection entity object(s) in order to perform various functionalities.

Note:

* Other than your own collection ADT, you may also use the ADTs created by other team members in your entity class and/or client class(es).
* **You are not allowed to use any collection interfaces or classes from the Java Collections Framework.**

1. Preparing an individual assignment report using the Google Doc template provided.
2. All code must be written using Java standard conventions (i.e. using Camel Case). Include your name as a comment at the beginning of each class that you authored.

Refer to the Assignment Rubrics for the assessment criteria and allocation of marks.

# Assignment Deliverables and Deadlines

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| **Date/Week** | **Deliverable/Activity** |
| Week 2-3 | **Assignment Idea Registration**  One representative to register your team’s assignment idea by submitting the Assignment Idea to your tutor |
| Week 10 | **Individual Assignment Report**   * To be submitted as a PDF file by each student.   **Assignment Rubric**   * To be submitted as a Google Sheet by each student.   **NetBeans project**   * To be submitted by each student. Please include your data files (e.g. text files/binary files) and also a ReadMe.txt file to explain how to run your application. |
| Week 11, 12 | **Assignment Demo**   * Each student must demo his own work. |

# Academic Integrity and Plagiarism

There must be originality in your work, i.e. do not copy or refer to other teams. You may only work with your team member(s) to produce the solution of this assignment. You must not share with or refer to any part of the assignment (including the code) of anyone else except your team member(s) and your tutor.

Before submitting your assignment, ensure that you have complied with TAR UC’s plagiarism policy. Any cheating, attempt to cheat, plagiarism, collusion and any other attempts to gain an unfair advantage in assessment will cause the students concerned to be penalized.

Students found to be dishonest are liable to disciplinary action.

# Late Submission

Refer to TAR UC’s Guideline on Late Submission of Coursework.