Project 2

The following is a report on the work done by Data Dynamo System on a project assigned during CSC 3105 coursework in the 2022/23 session, as follows:

Question

Data structures complement algorithms in the way programs work, on account of their facility for organizing and enabling access to data; thus, understanding data structures is fundamental to our knowledge and use of programs, irrespective of what paradigm is in play.

1. Each group in your corporation is to identify and describe ALL data structures used in programming.
2. Each group in your corporation is to attempt the development of these data structures as they can, in ONE programming language among Java, JS, PHP and Python.

Response

1. **Identified Data Structures Used in Programming.**

S/N	DATA TYPE	
1	Arrays	An array is a collection of elements identified by index or key values. It's the simplest data structure where each data element can be randomly accessed by using its index number.
2	Linked	A linked list is a linear data structure where each element is a separate object. Each element (node) of a list is comprising of two items the data and a reference to the next node.
3	Stacks	A stack is a linear data structure that follows a particular order in which the operations are performed. The order may be LIFO (Last In First Out) or FILO (First In Last Out).

4	Queues	A Queue is a linear structure which follows a particular order in which the operations are performed. The order is First In First Out (FIFO).
5	Trees	A tree is a nonlinear data structure with hierarchical relationships between its elements without having any cycle. Trees are used to represent hierarchical data.
6	Graphs	A graph data structure consists of a finite (and possibly mutable) set of vertices or nodes or points, together with a set of unordered pairs of these vertices for an undirected graph or a set of ordered pairs for a directed graph.

2. **Assign each of the six groups one data structures**

GROUP	DATA TYPE	PROGRAMMING LANGUAGE
Group 19	Arrays	Java
Group 20	Linked	JavaScript
Group 21	Stacks	PHP
Group 22	Queues	Python
Group 23	Trees	Java
Group 24	Graphs	Python

General Responsibilities:

1. **Research and Understanding:**

Thoroughly research the assigned data structure and its implementation details.

Ensure a clear understanding of the purpose, operations, and complexities associated with the data structure.

2. **Implementation:**

Write clean, efficient, and well-documented code for the assigned data structure.

Follow best practices and coding standards relevant to the chosen programming language.

5. Collaboration:

Communicate effectively within the group to coordinate tasks and share progress updates.

Address any issues or challenges encountered during the implementation process collaboratively.

General Assessment (*Reg Number of those who contribute***):**

CEO: 20/CSC/084		
Group	**Group Leader**	**Group Member**
Group 19	20/CSC/259	20/CSC/199 20/CSC/025 20/CSC/077 20/CSC/003
Group 20	22/D/CSC/007	20/CSC/195 20/CSC/117 20/CSC/145
Group 21	20/CSC/013	20/CSC/109 20/CSC/158 20/CSC/057 20/CSC/087
Group 22	20/CSC/063	20/CSC/051 20/CSC/225 20/CSC/056 20/CSC/193

Group 23	20/CSC/171	20/CSC/001 20/CSC/148 20/CSC/072 20/CSC/055
Group 24	20/CSC/168	20/CSC/053 20/CSC/067