

Lab Report (Basic Data Structures and Algorithms)

I/we the undersigned, promise that the submitted lab report is/are my/our own work.

While I/we was/were free to discuss ideas with others, the work contained is my/our own. I/we recognize that should this not be the case; I/we will be subject to penalties as outlined in the course syllabus.

(By typing in your name below, you agree to Academic Integrity and honesty)

Name: **Nero Hamidi**

Red-Id: **827723033**

Reflection:

In a short paragraph explain your learnings and understanding on basic data structures and algorithms

Explain

- Hashing
- Divide and conquer
- Big OH (O) notation
- Logarithmic time complexity
- Stack

Data Structures and Algorithms both help programmers complete their code more efficiently. Hashing is a system where data is mapped onto a specific value so it can be accessed later; this is helpful in terms of easily storing and retrieving data. Divide and Conquer is a problem-solving strategy where the goal is to break up a larger collection of data into smaller chunks to make searching and sorting easier. This helps algorithms in becoming more efficient. Big O (O) notation is a way to denote the run time complexity of a program. The notation reflects the worst-case scenario for how long it would take to complete a particular program. For example, when searching for a value in an array length N, the worst case is that it searches every value in the array; therefore the Big O (O) notation is $O(N)$. Logarithmic time complexity can be seen in such algorithms as Binary sort. It is when the running time of the program increases logarithmically with an increase in the input; the notation would be $O(\log(n))$. A stack is a data structure that follows the last in first out rule. This means that the last thing you enter into a stack will be the first thing you retrieve when calling upon it.