**CSE 212 – Programming with Data Structures**

**W10 Prove – Response Document**

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**Question 1: Provide the outline for the data structures tutorial you are creating for the final project. Use the Python Fundamentals Tutorial outline provided in the assignment instructions as an example.**

1. WELCOME
   1. Introduction (Cover what will be taught and the outcome of the modules)
2. QUEUE
   1. Explain: What is a Queue (FIFO)?
   2. Queue Diagram
   3. How are queues relative to programming?
   4. Python Code example on simple FIFO.
   5. Problem: Product Waiting list creation. I solve
   6. Problem: Apartment Waitlist (Queue will apply FIFO and will filter based on desire (1 bedroom, two bedrooms, or no preference)
   7. Solution Code
   8. Link to WELCOME
3. LINKED LIST
   1. Explain: What is a Linked List (Nodes and Pointers)
   2. Linked List diagram
   3. Explain Heads, tails, and doubly linked lists.
   4. Explain inserting (head, tail, and middle) with example code
   5. Explain removing (head, tail, and middle) with example code
   6. Explain advantages with big O notation.
   7. Problem: Printing all items in a linked list with a specific value. I solve.
   8. Problem: Printing all items in a linked list with a specific value and then removing that value.
   9. Solution Code
   10. Link to WELCOME
4. TREES
   1. Explain: What is a Tree (How they relate to dynamic lists, linked lists)
   2. Explain: Binary Trees
   3. Binary Tree Diagram
   4. Explain BST (Binary Search Tree): Data separated to the left or to the right.
   5. BST Diagram
   6. Explain balanced BST
   7. Explain how to traverse Tree with Code example
   8. Explain how to get height of tree with code example
   9. Problem: Get the number of all items in the binary tree. I solve
   10. Problem: Get the sum of all the elements in the binary tree.
   11. Solution Code.
   12. Link to WELCOME
5. WELCOME (after lesson modules)
   1. Closing remarks.