ADTS and Algorithm Assignment

Due 4/11/24 : submit via email: muliaro@icsit.jkuat.ac.ke

INSTRUCTIONS: Work as a group and submit as a group listing all members names and Reg Numbers.

NOTE: Every group MUST provide independent answers.

1. Describe the structure of a node in a singly linked list. What fields are typically included in this structure?
2. Implement a function to reverse a singly linked list iteratively and explain the logic behind it.
3. Differentiate between singly, doubly, and circularly linked lists. Provide one application where each type would be most suitable
4. Design a queue using two stacks
5. How would you implement a priority queue? Describe its operations and potential applications.
6. Write a function to implement a stack using an array and ensure your implementation handles overflow conditions.
7. For each of the following operations, specify which data structure (linked list, queue, or stack) is most appropriate and why:
    a. Traversing in reverse order
    b. Ensuring first-in-first-out processing
    c. Tracking function calls in recursion
8. Describe a scenario where both a queue and stack would be required to solve a problem efficiently. Outline the problem and solution approach.