Practice Questions

Problem 1.

Please provide a step by step solution of sorting the following list using Bubble Sort in descending order.

[5, 6, 9, 7, 2 ,4, 1]

Problem 2.

Please provide a step by step solution of sorting the following list using Insertion Sort in ascending order.

[5, 6, 9, 7, 2 ,4, 1]

Problem 3.

Please provide a step by step solution of sorting the following list using Selection Sort in descending order.

[4, 3, 9, 5, 7, 8, 2]

Problem 4.

Please explain the difference between Stack and Queue.

Problem 5.

Start with an empty queue. Perform the following operations in order: `ENQ 3, ENQ 5, DEQ, ENQ 2, ENQ 7, DEQ, ENQ 4`
Write down the output of each `DEQ` operation and the final content of the queue (from front to rear).

Problem 6.

Please write the pseudo code of the Bubble Sort below.

Problem 7.

Is the linear array a suitable data structure for a queue? Whay?

Problem 8.

Given the initial list:
`2 ⇄ 5 ⇄ 8` (head points to 2, tail points to 8)

Perform the following operations:

1. Insert a new node **7** *after* the node containing **5**.
2. Delete the **head** node.
3. Insert a new node **1** at the *beginning* of the list.
4. Delete the node with the value **7**.

For each step:

- Draw or describe the list after the operation.
- Clearly indicate how the **prev** and **next** pointers are updated.