(a) (4 points) Write down the pseudocode for an in-situ algorithm that reverses a linked list of n elements in Θ(n). Explain why it is an in-situ algorithm.

```
// Initialize 3 pointers:
        previous* = NULL
        current* = head // where head is the first element (i.e.: 12)
        next* = NULL
// In a loop until current reaches NULL
        next = current→next // in order to point to the next element of current
        current→next = previous // now we change the direction of current to NULL
        previous = current // so we iterate previous through the list
        current = next // so we iterate current through the list
// Initialize the new head
        head = previous // where previous is the last element (i.e.: 54)
```

This is an in-situ algorithm as the operations are happening in place. Meaning that we do not need extra storage or data structure, we just change the direction of the pointers.
(*i.e.:* 12 → 45 → 54 → **NULL** => **NULL** ← 12 ← 45 ← 54)