LAB CASE: PHASE 1

a) What attributes are needed to implement this dictionary?

As we decided to use a doubly linked list to implement the dictionary in this phase, and we are not interested in keeping track of the size, the only attributes will be:

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DNode header;
DNode trailer;
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b) Implement the following operations that can be done in the dictionary

Done in the corresponding file

c) Calculate the complexity of the methods of the dictionary structure

isEmpty → $T(n) = 1 \in O(1)$
toString → $T(n) = 3 + 2n \in O(n)$

addFirst → $T(n) = 7 \in O(1)$
addLast → $T(n) = 7 \in O(1)$

add(Queue queue) → $T(n) = (2 + \text{complexity of add(String newWord)})\ n \in O(n^3)$
add(String newWord) → $T(n) = 4n + ((n-1)(4+\text{complexity of addLast}))\ n \in O(n^2)$

search → $T(n) = 3n + 1 \in O(n)$
show → $T(n) = 4n + 3 \in O(n)$

getTop → $T(n) = 13n^2 + 9 \in O(n^2)$
getLow → $T(n) = 13n^2 + 9 \in O(n^2)$

* *The complexity study of all methods corresponds to the complexity study of its worst case.*