Computer Science 3A

Practical Assignment 8

25 April 2024

Time: 25 April 2024 — 17h00

Marks: 50

Practical assignments must be uploaded to `eve.uj.ac.za` **before** 17h00 in the practical session.

You are **not allowed to collaborate** with any other student. You **must** upload your assignment to Eve **before** it will be marked.

You are required to complete a Skip List implementation which realises the Dictionary Interface. Skip Lists can be very efficient structures, however they can also be very memory hungry. The efficiency of the list is due to the randomized nature of the inserts. The Skip List which must be implemented is constructed from quad-nodes and all the appropriate references must be maintained during the insert operations.

You must complete the following methods marked by:

```
//TODO: COMPLETE
```

Please note that you should not add any additional methods to any classes provided

In order to solve this problem you need to complete the following:

1. `SLNode class` — data members, constructor, accessor and mutator methods.

2. `searchSkip` — Search for an item in the Skip List.

3. `insertAfterAbove` — Insert an node after a a given node but above a specified node.

4. `insert` — Insert an element into the Skip List

5. `entries` — Retrieve a snapshot iterator over all the entries in the Skip List

The following files must be submitted to EVE:

1. *studentnumber*_p9.zip

Marksheet

1. SLNode class [10]

2. SkipList: searchSkip [5]

3. SkipList: insert [10]

4. SkipList: insertAfterAbove [5]

5. SkipList: entries [5]

6. Correctness [15]