Memtable –SkipList

조태규

Skip List

- What is difference of deletion in skip list?

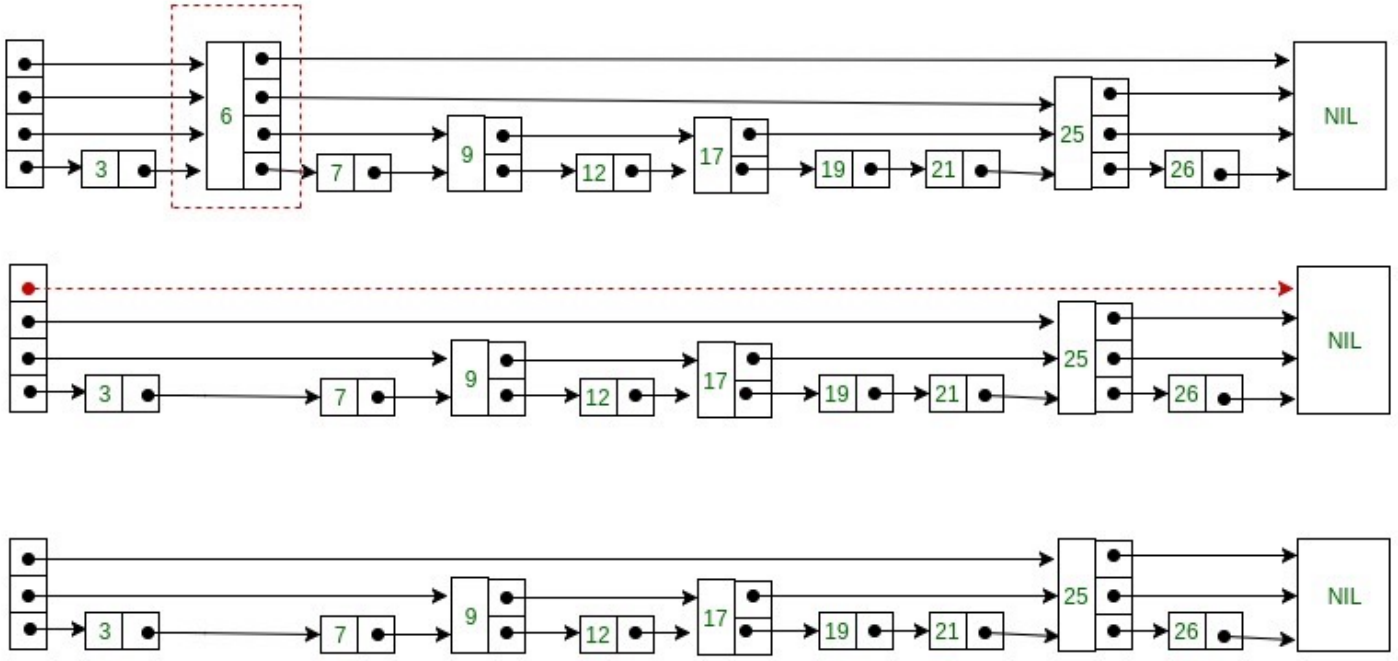
  In normal vs In LevelDB

- Why?

- How to delete element in LevelDB?

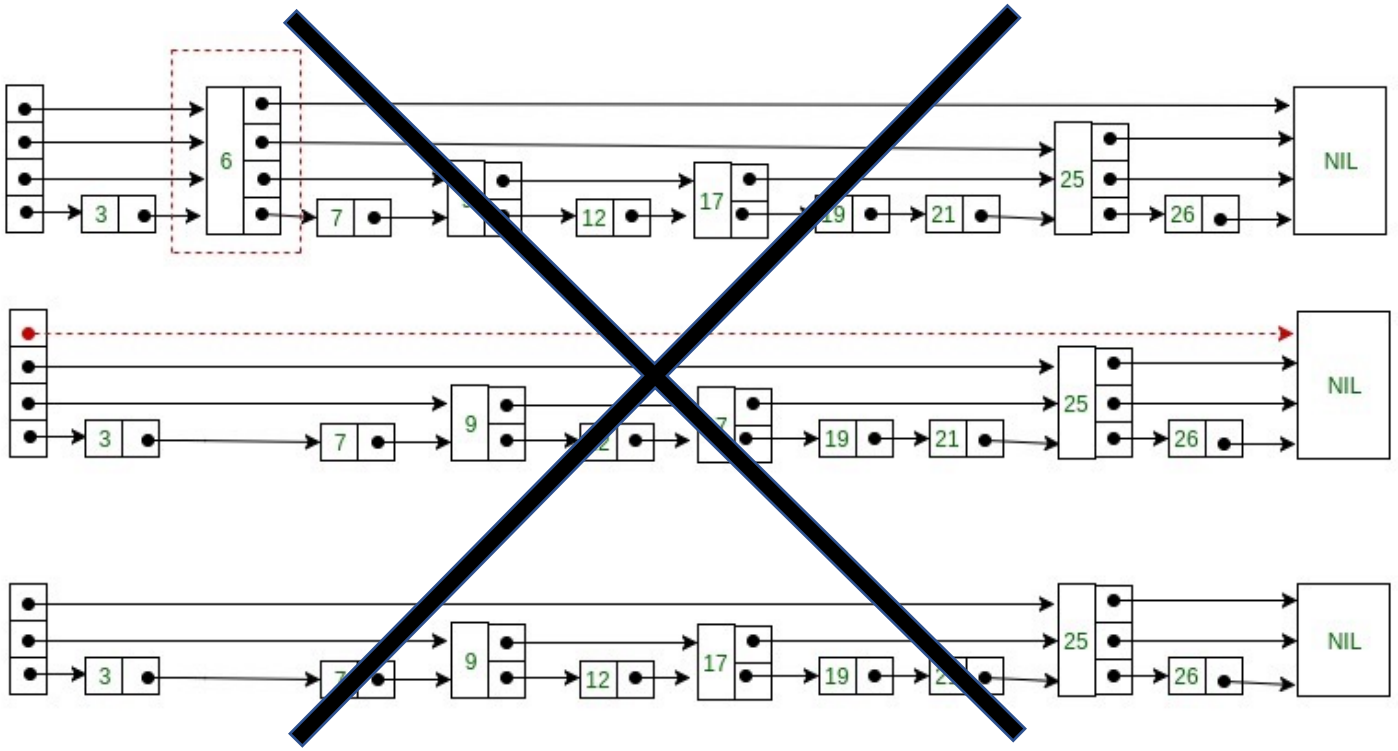
SkipList – Deletion In normal skiplist

- How to delete element(key = 6) in normal skip list?
  1) Find the element that needs to be deleted(key = 6)
  2) Delete the element
  3) Adjust the pointer and height(if nessesary)



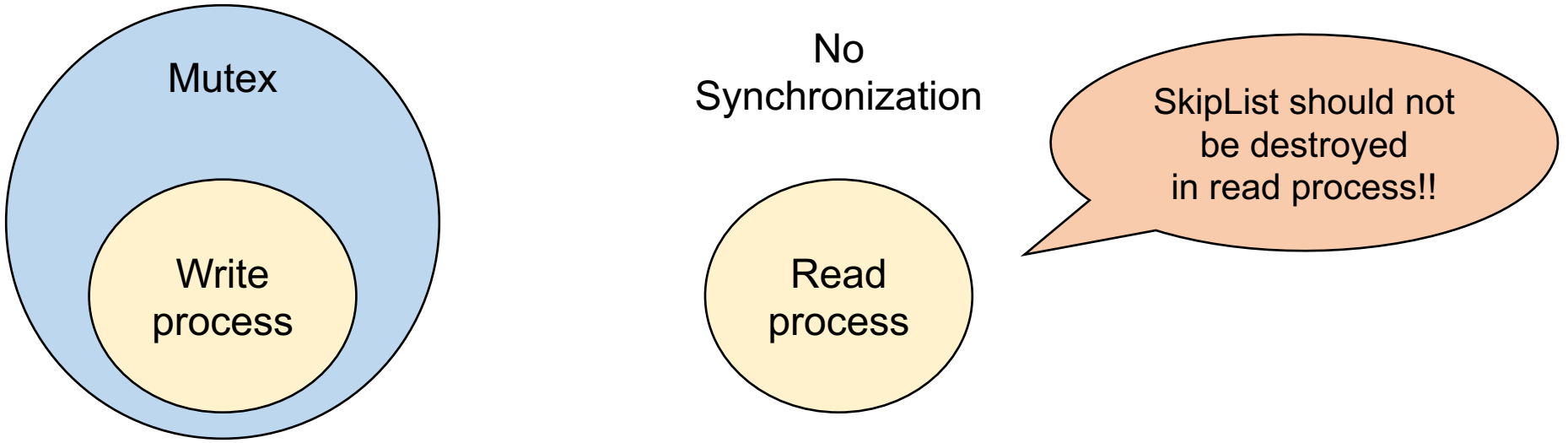
SkipList – In LevelDB(Delete by Insert)

- There is no delete inferface in LevelDB skip list!
- Inserts element with tag that determines whether to delete or not



SkipList – Why? For thread safety!

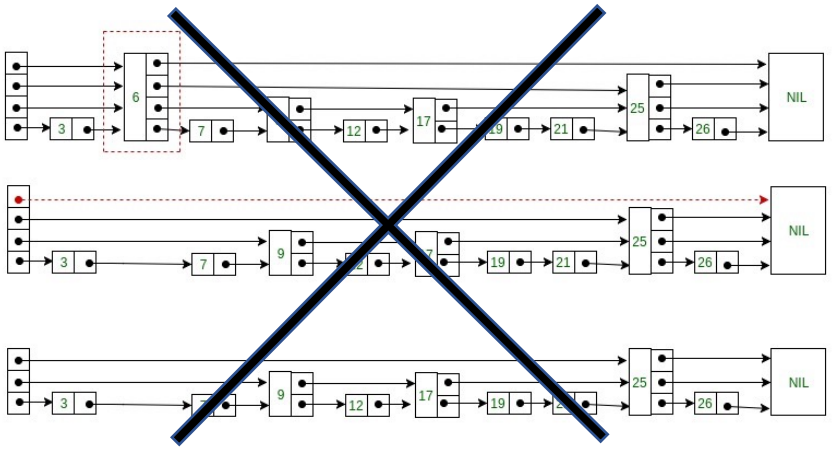
- Writes require external synchronization(mutex)
- Reads process (without any internal locking or synchronization) requires a guarantee that SkipList will not be destroyed



SkipList – Why? For thread safety!

- There is no Deletion node in code => Code guarantees that we never delete any skip list nodes
- Only Insert modifies the list, and it is careful to initialize

No Deletion node



Allocated nodes
are never deleted

SkipList – Then, How?

- Nodes with delete tag are deleted at once in compaction
- MergingIterator merge multiple ordered data sets, using InternalKey(userkey, seq, type)
- The larger the seq, the newer the record

Key

INSERT 9
tag: kTypeDeletion
Value : 0
Seq : a

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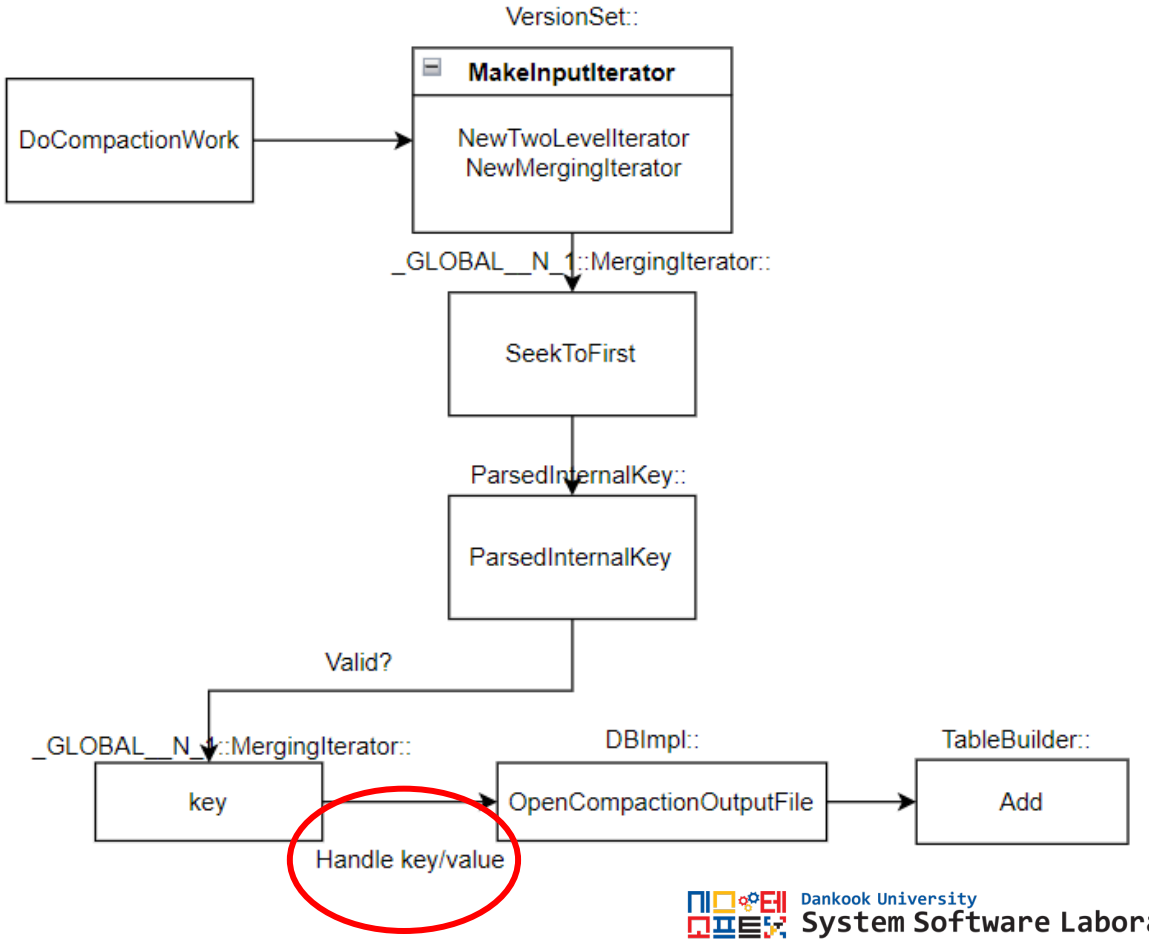
Key

INSERT 9
tag: kTypeValue
Value : x
Seq : b

always value 0



Q&A

감사합니다 Thank you!