

(b)

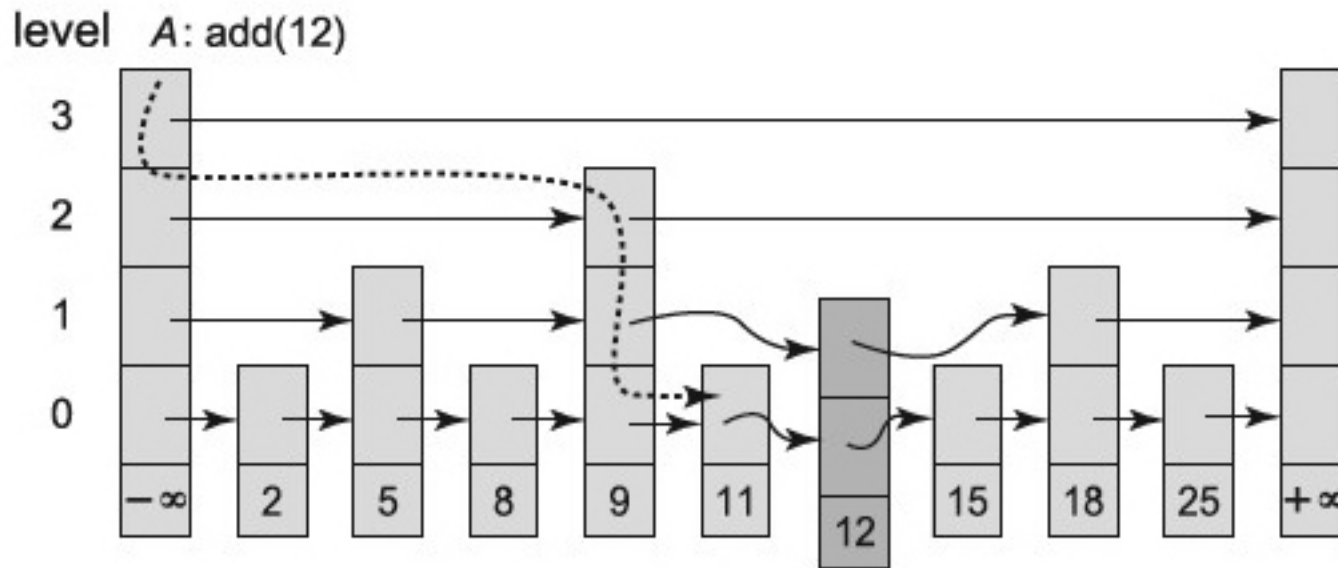


FIGURE 14.2B The SkipList class: `add()` and `find()` methods. In part (a), `find()` traverses at each level, starting at the highest level, for as long as `curr` is less than or equal to the target key 12. Otherwise, it stores `pred` and `curr` in the `preds[]` and `succs[]` arrays at each level and descends to the next level. For example, the node with key 9 is `preds[2]` and `preds[1]`, while `tail` is `succs[2]` and the node with key 18 is `succs[1]`. Here, `find()` returns *false* since the node with key 12 was not found in the lowest-level list, and so an `add(12)` call in part (b) can proceed. In part (b), a new node is created with a random `topLevel = 2`. The new node's next references are redirected to the corresponding `succs[]` nodes, and each predecessor node's next reference is redirected to the new node.