

CSE 332: Data Abstractions

Section 1: WorkLists

WorkList ADT

add(work)	Notifies the worklist that it must handle work
peek()	Returns the next item to work on
next()	Removes and returns the next item to work on
hasWork()	Returns true if there's any work left and false otherwise

0. Interview Question: The Missing Number

Suppose `nums` is a `WorkList` of size n which contains each number between 1 and n exactly once. A user calls `nums.next()` but forgets to save the value. Recover the value that was removed. Can you do it if two values are removed? What are the time and space complexity of your solution?

1. Choosing The Data Structures

Choose data structures and algorithms to solve the following problems:

- (a) Call all the phone numbers with a particular area code in someone's phone book.

What is the time complexity of your solution? What is the space complexity?

- (b) Text on nine keys (T9)'s objective is to make it easier to type text messages with 9 keys. It allows words to be entered by a single keypress for each letter in which several letters are associated with each key. It combines the groups of letters on each phone key with a fast-access dictionary of words. It looks up in the dictionary all words corresponding to the sequence of keypresses and orders them by frequency of use. So for example, the input '2665' could be the words {book, cook, cool}. Describe how you would implement a T9 dictionary for a mobile phone.