

CPS 130 Homework 11

Hashing

*Write and justify your answers in the space provided.*¹

1. (CLRS 11.1-4) We wish to implement a dictionary by using direct addressing on a *huge* array. At the start, the array entries may contain garbage, and initializing the entire array is impractical because of its size. Describe a scheme for implementing a direct-address dictionary on a huge array. Each stored object should use $O(1)$ space; the operations SEARCH, INSERT and DELETE should take $O(1)$ time each; and the initialization of the data structure should take $O(1)$ time.

(Hint: Use an additional stack, whose size is the number of keys actually stored in the dictionary, to help determine whether a given entry in the huge array is valid or not.)

¹Collaboration is allowed, even encouraged, provided that the names of the collaborators are listed along with the solutions. Students must write up the solutions on their own.

