Exercise 2

Hashing - Hard Version

https://pintia.cn/problem-sets/16/problems/680

Slides adapted from material by
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问题描述

Given a hash table of size N, we can define a hash function H(x) = x%N. Suppose that the linear probing is used to solve collisions, we can easily obtain the status of the hash table with a given sequence of input numbers.

However, now you are asked to solve the reversed problem: reconstruct the input sequence from the given status of the hash table. Whenever there are multiple choices, the smallest number is always taken.

输入输出格式

- Input Specification:
- Each input file contains one test case. For each test case, the first line contains a positive integer N (<=1000), which is the size of the hash table. The next line contains N integers, separated by a space. A negative integer represents an empty cell in the hash table. It is guaranteed that all the non-negative integers are distinct in the table.

- Output Specification:
- For each test case, print a line that contains the input sequence, with the numbers separated by a space. Notice that there must be no extra space at the end of each line.

输入输出示例

Sample Input:
11
33 1 13 12 34 38 27 22 32 -1 21

Sample Output:
1 13 12 21 33 34 38 27 22 32

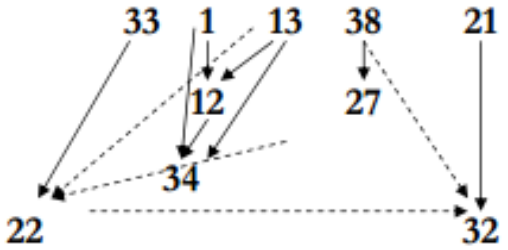
分析

- 已知 H(x) = x%N 以及用线性探测解决冲突问题

- 先给出散列映射的结果，反求输入顺序
  - 当元素x被映射到H(x)位置，发现这个位置已经有y了，则y一定是在x之前被输入的

算法示例

下标	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
H[ ]	33	1	13	12	34	38	27	22	32		21



1 13 12 21 33 34 38 27 22 32

拓扑排序！

完整代码

完整代码实现

Data Structures

…End…