Seoul National Uiniversity

M1522.000900 Data Structure

Homework 7: Searching (Chapter 9)

Computer Science & Engineering

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Question1

(1) true.

index	0	1	2	3	4	5	6	7	8	9	10
comparison	3	4	2	3	4	1	3	4	2	3	4

number of total comparison = 1*1+2*2+3*4+4*4=33

Average number of search = 33/11 =3

(2) true. The size of optimal jump is $n^{1/2}$. So average case time complexity and worst case time complexity are both $O(n^{1/2})$. Let the worst case cost T(n). Because T(n) is in the set $O(n^{1/2})$, T(n) is in the set O(n).

(3) false. If 1st position is key, key comparison is 1. If last position is key, key comparisons is n. So the average number of key comparisons is (n+1)/2.

Question2

(1)

Slot	0	1	2	3	4	5	6
Value	null	null	9	3	2	12	null

(2)

P(slot0) = P(slot1) = 37/256, P(slot6) = 128/256 = 91/128

It is problem of linear probing. Nonempty slots are clustered, and thus giving unequal probability to empty slot.

Question3

(1) k=10. The number of comparison is 12.

(2) k=4. The number of comparison is 6.

Question4

I felt happy because 4 saw the others were 7 and 8 8 knew 2 should feel 7, but 5 was not really 6.