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Week 10 Quiz

Plagiarism declaration

By submitting work for this quiz I hereby declare that I understand the University's policy on academic integrity (https://academicintegrity.unimelb.edu.au/) and that the work submitted is original and solely my work, and that I have not been assisted by any other person (collusion) apart from where the submitted work is for a designated collaborative task, in which case the individual contributions are indicated. I also declare that I have not used any sources without proper acknowledgment (plagiarism). Where the submitted work is a computer program or code, I further declare that any copied code is declared in comments identifying the source at the start of the program or in a header file, that comments inline identify the start and end of the copied code, and that any modifications to code sources elsewhere are commented upon as to the nature of the modification.

This is a preview of the draft version of the quiz.

You should attempt the quiz after the lecture and your tutorial.

- The quiz is available for a period of 10 days.
- You may attempt the quiz multiple times (if you happen to get a question wrong, you can do it again)
- Your score on the quiz will be recorded in the grade book. The score is not used when determining your final mark in this subject
- The quiz might not display equations correctly in some browsers. If you experience problems, we recommend that you use Firefox.

Quiz Type	Graded Quiz
Points	7
Assignment Group	Imported Assignments
Shuffle Answers	No
Time Limit	No Time Limit
Multiple Attempts	Yes
Score to Keep	Highest
Attempts	Unlimited
View Responses	Always
Show Correct Answers	Immediately
One Question at a Time	No

Due	For	Available from	Until
-	Everyone	-	-

Preview

Score for this attempt: **7** out of 7
Submitted Sep 25 at 11:38
This attempt took 1 minute.

Question 1

1 / 1 pts

Suppose we have a hash function h(k) = k mod 11 and a hash table T of size 11.

When the following keys 44, 77, 30, 92, 100, 54, 63 are inserted into T using linear probing (that is, in an open-addressing manner), the key 100 will be in table position?

Correct!

- (•) 2
- ( ) 0

1

10

Well done. Too easy!

Question 2

1 / 1 pts

A hash table with 5003 entries is used with linear probing (that is, in an open-addressing manner). It currently holds 4000 keys/records. How many probes should we expect during a lookup for some key that is in fact present (that is, in a successful search)?

2

Correct! 3

4

5

6

At least 7

Yes, you have earned another badge.

Question 3

1 / 1 pts

Edsger Dijkstra studied the following problem which he called the Problem of the Dutch National Flag. We are given an array of pebbles, some blue, some red, some white. We want to rearrange them in the order of the Dutch flag, that is, first come the red, then the white, and finally the blue pebbles. Which sorting method is best suited for this task, that is, most efficient?

- Heapsort
- Insertion sort
- Mergesort
- Quicksort
- Selection sort
- Shellsort

Correct!

- Sorting by counting

That's right. There are only three different keys, so this is an ideal setting for sorting by counting.

Question 4

1 / 1 pts

Which of the following statements about hashing is false?

Correct!

- A good hash function maps similar data items or records to the same hash values.
-

A good hash function uniformly distributes data items across the entire set of possible hash values.

A perfect hash function allows for constant time search, insertion, and deletion, into and from a hash table.

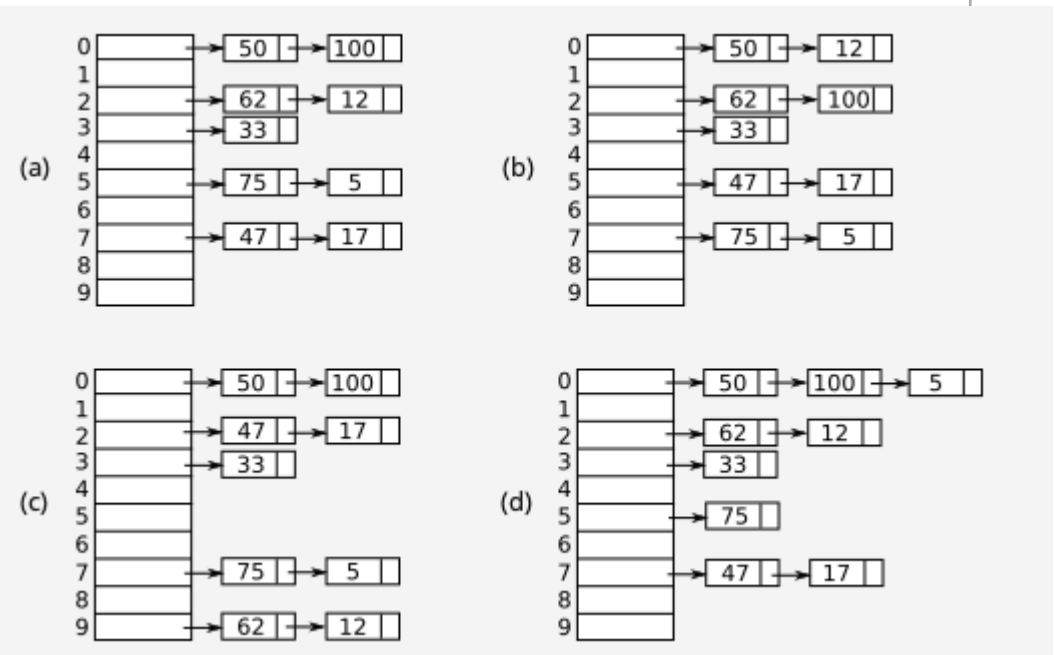
When using an open addressing method of collision resolution, all data records reside in a single bucket array.

Question 5

1 / 1 pts

Consider an emtpy Hash Table, and the simple hash function f(key) = key mod 10. (Note, we know 10 is not prime ...)

When using the separate chaining with linked lists method of collision resolution, which of the following hash tables is produced after inserting keys 12, 5, 100, 50, 75, 17, 62, 33, and 47, in that order, into the above table. Note that when inserting an item into an unsorted linked list, we insert it at the front of the list.



Correct!

(a)

(b)

(c)

(d)

CORRECT: Each time we insert a key K into our table, we add it to the linked list at index = K mod 10. In this example, we are inserting our keys at the front of the relevant linked lists.

Question 6

1 / 1 pts

Consider this instance of the knapsack problem. We have a total capacity W = 12 and six items, with weights and values as follows:

item	weight	value
1	3	20
2	2	15
3	3	25
4	4	30
5	5	30
6	6	50

The dynamic programming algorithm will establish that the optimal value that can be achieved for this instance is:

Correct!

95

rrect Answers

95 (with margin: 0)

Yes, that's right. Items 2, 4 and 6 will be selected.

Question 7

1 / 1 pts

If a dynamic programming problem satisfies the optimal-substructure property, then a locally optimal solution is globally optimal.

Correct!

- (•) True
- ( ) False

Quiz Score: **7** out of 7