Unit 7 - Week 5

Assignment 5

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-03-04, 23:59 IST.

1) Which of the following is **NOT** a dictionary operation *1 point*

(a) Insert
(b) Sort
(c) Search
(d) Delete

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

2) Given a hash table T with n slots that stores m elements, we define the load factor a for T *1 point*

(a) n/m
(b) m/n
(c) nm
(d) n^m

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

3) Consider we insert the keys $5, 28, 19, 15, 20, 33, 12, 17, 10$ into a hash table with collisions resolved by chaining. Let the table have $9 (0, 1, \ldots, 8)$ slots, and let the hash function be $h(k) = k \mod 9$. Then the 5^{th} slot will contain *1 point*

(a) 3 elements
(b) 2 elements
(c) 1 elements
(d) 0 elements

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

4) In the division method for creating hash functions, the hash function is (k is the key to be hashed and m is the available slots) *1 point*

(a) $h(k) = k \mod m$
(b) $h(k) = k/m$
(c) $h(k) = m/k$
(d) $h(k) = m \mod k$

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

5) Double hashing uses a hash function of the form, where h_1 and h_2 are auxiliary hash functions., *1 point*

(a) $h(k,i) = (h_1(k) \times ih_2(k)) mod m$
(b) $h(k,i) = (h_1(k) + ih_2(k)) mod m$
(c) $h(k,i) = (h_1(k)/ih_2(k)) mod m$
(d) None of the above

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

6) Inserting an element into an open-address hash table with load factor α requires at most ..... probes on average, assuming uniform hashing. *1 point*

(a) $\frac{1}{1+\alpha}$
(b) $\frac{1}{1-\alpha}$
(c) $\frac{1}{\alpha}$
(d) α

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

7) Given an open-address hash table with load factor $\alpha < 1$, the expected number of probes in a successful search is at most *1 point*

(a) $\frac{1}{\alpha} \ln \frac{1}{1+\alpha}$
(b) $\frac{1}{\alpha} \ln \frac{1}{2}$
(c) $\frac{1}{\alpha} \ln \frac{1}{1-\alpha}$
(d) $\frac{1}{1+\alpha} \ln \frac{1}{1+\alpha}$

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

8) Consider an open-address hash table with uniform hashing. The upper bound on the expected number of probes in an unsuccessful search when the load factor is $3/4$ is *1 point*

(a) 1
(b) 2
(c) 3
(d) 4

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

9) Consider an open-address hash table with uniform hashing. The upper bound on the expected number of probes in a successful search when the load factor is $7/8$ is: *1 point*

(a) 2.377
(b) 1.998
(c) 1.567
(d) 1.4

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

10) If we store n keys in a hash table of size $m = n^2$ using a hash function h randomly chosen from a universal class of hash functions, then the probability of there being any collisions is less than *1 point*

(a) 1/2
(b) -0.5
(c) 1/4
(d) 0

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.