Started on	Monday, 12 April 2021, 12:10 PM
State	Finished
Completed on	Monday, 12 April 2021, 1:09 PM
Time taken	59 mins 48 secs
Grade	**15.00** out of 21.00 (**71**%)

Question 1

Correct

Mark 3.00 out of 3.00

Flag question

Consider that extendable hashing technique is used for dynamic hashing on a search key *dept_name* for a relation *Student* (ID, dept_name) as shown below. Assume that each bucket can contain up to **four** records. The hash function and the relation are shown below. The records are inserted in the same order as shown in the *Student* table. At the end of all insertions, determine the number of entries from the bucket address table that will point to the bucket containing the entry 124 HSS.

Student	
ID	**dept_name**
111	ECE
112	HSS
113	CSE
114	ECE
115	MTH
116	ECE
117	CSE
121	CSE
122	MTH
123	PHY
124	HSS
125	PHY
126	ECE
127	HSS

dept_name	Hash function h(dept_name)
CSE	00010
ECE	00101
HSS	10000
MTH	01001
PHY	11000

Answer: 2

The correct answer is: 2

Question 2

Correct

Mark 3.00 out of 3.00

Flag question

Consider a set of 5 transactions T1, T2, T3, T4 and T5 with timestamps 1, 2, 3, 4 and 5, respectively.

T1	T2	T3	T4	T5
				Read(d)
Read(b)				
	Write(b)			
	Read(c)			
		Write(c)		
Read(x)				
		Write(b)		
				Write(x)
			Write(c)	
		Write(d)		

Which of the transactions will be **rolled back** if concurrency control is done using Timestamp-based protocol (a) without and (b) with Thomas' Write Rule (TWR)?

Select one:

- T1, T3, T4 without TWR and T3, T4 with TWR
- T3 without TWR and T3 with TWR ✓
- T2, T3 without TWR and T3 with TWR
- T4 without TWR and none with TWR
- T2 without TWR and T2 with TWR
- T1 without TWR and none with TWR
- T1 without TWR and T1 with TWR
- T5 without TWR and none with TWR
- T1, T2 without TWR and T2 with TWR
- T2, T3 without TWR and T2 with TWR
- T4 without TWR and T4 with TWR
- None without TWR and None with TWR
- T3 without TWR and none with TWR
- T2 without TWR and none with TWR
- T5 without TWR and T5 with TWR
- T1, T2, T4 without TWR and T1, T2 with TWR
- T1, T2 without TWR and T1 with TWR

Your answer is correct.

The correct answer is: T3 without TWR and T3 with TWR

Question 3

Correct

Mark 3.00 out of 3.00

Flag question

Consider that for a B+ tree, the maximum and minimum number of search key values in the leaf nodes are 3 and 2, respectively. The maximum and minimum number of pointers in the non-leaf nodes are 4 and 2, respectively. The number of entries in root node is guided by the standard definition of B+ Trees. [For ease of your understanding, we clarify that the maximum and minimum number of entries in this tree are same as those in the examples we have discussed in the slides for insertion and deletion in B+ Trees.]

Now, assume that the following 13 entries are made sequentially in this B+ Tree.

Ndd, Edd, Gdd, Sdd, Bdd, Cdd, Ddd, Fdd, Kdd, Ldd, Tdd, Wdd and Add, where dd denotes the last two digits of your roll number. For example, if your roll number is 17CS10002, the entries are:
N02, E02, G02, S02, B02, C02, D02, F02, K02, L02, T02, W02 and A02.

Next, the entries Tdd and Fdd are sequentially deleted from the tree.

At this stage, determine the number of pointers present in the node which is the parent of the leaf node containing Edd.

Answer: 2 ✓

The correct answer is: 2

Question 4

Incorrect

Mark 0.00 out of 3.00

Flag question

Consider that the initial values of A, B, C and D are 20, 50, 60 and 80, respectively and the following content of a log (written in the same line here for space saving):

<T0 start>, <T0, A, 20, 40>, <T0, B, 50, 60>, <T1 start>, <Checkpoint {T0, T1}>, <XXXX>, <YYYY>, <T2 start>, <T0 abort>, <T3 start>, <T3, B, 50, 200>, <T2, A, 20, 100>, <T1, D, 80, 90>, <T1, C, 60, 30>, <T2 commit>, <T1 commit>.

[Note: Log entries XXXX and YYYY have deliberately not been mentioned. You may determine those for working out the answer to the question given below.]

After the last log entry above, assume there is a system crash. Once recovery is complete, determine which (one or more) of the following new log records will be present in the log (Ignore the order of the entries if there are more than one). If you feel no new record will be added, choose that option.

Select one or more:

- [ ] <T0, B, 60, 50>
- [ ] <T0 Commit>
- [x] <T3, B, 50> ✓
- [ ] <T0, A, 40, 20>
- [ ] <T2, A, 20>
- [ ] <T1 Commit>
- [x] <T0 Abort> ✗
- [x] <T3 Abort> ✓
- [ ] <T3 Commit>
- [ ] No new log record will be added during recovery
- [ ] <T2 Commit>

Your answer is incorrect.

The correct answer is: <T3, B, 50>, <T3 Abort>

Question 5

Correct

Mark 3.00 out of 3.00

Flag question

Consider a concurrent schedule of 5 transactions T1, T2, T3, T4 and T5 as shown below.

T1	T2	T3	T4	T5
				Read(d)
Read(b)				
	Write(b)			
	Read(c)			
		Write(c)		
Read(x)				
		Write(b)		
				Write(x)
			Write(c)	
		Write(d)		

The equivalent serial schedule(s) is/are (Here equivalent serial schedule means conflict equivalent and/or view equivalent to the given schedule):

Select one or more:

- [x] T1, T2, T5, T3, T4 ✓
- [ ] T3, T1, T5, T2, T4
- [ ] T2, T1, T3, T4, T5
- [ ] The given schedule is not even view serializable
- [x] T1, T5, T2, T3, T4 ✓
- [ ] T1, T5, T3, T2, T4
- [ ] T2, T3, T1, T4, T5
- [ ] T3, T5, T2, T4, T1
- [ ] T3, T1, T5, T2, T4
- [ ] T2, T1, T4, T5, T3
- [ ] T5, T1, T2, T3, T4

Your answer is correct.

The correct answer is: T1, T2, T5, T3, T4, T1, T5, T2, T3, T4

Question 6

Correct

Mark 3.00 out of 3.00

Flag question

Consider the 4 transactions given below. Let minimum support be 50% (i.e., an itemset is considered to be frequent (or large) if at least 2 out of the 4 transactions contain that itemset) and minimum confidence be 90%. Determine the total number of meaningful association rules (i.e., association rules with support greater than or equal to minimum support and confidence greater than or equal to minimum confidence).

Transaction	Items purchased
T1	Bread, Cheese, Jam, Milk
T2	Butter, Ketchup, Milk
T3	Bread, Butter, Milk, Ketchup
T4	Butter, Ketchup, Juice

Answer: 5

The correct answer is: 5

Question 7

Incorrect

Mark 0.00 out of 3.00

Flag question

Consider that a relation is stored in a file having 80 disk blocks. We want to do external sorting of this file using sort-merge technique. The total number of memory buffer blocks available is 5. Determine the total number of block transfers required if we assume the final output will also be written back to disk.

Answer: 900

The correct answer is: 480

Finish review

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