CS245: Database Management Systems

Assignment # 03 (3 Questions, 10 Points)
Date of Assignment # 03 : 30-May-2020 @12:00 noon
Date of Submission of Assignment # 03 : 31-May-2020 @12:00 noon
30-May-2020 (Sat) IIT Guwahati

Note: The following are the exercise problems in the text book `https://bit.ly/2UTjzMU`. Any details given in this assignment differs with that in the text book problem, you should refer to text book problem as the final version for evaluation.

Question 1: (4 points)

The following is a sequence of undo/redo log records written by two transactions U and V.

< START T >
< T , A, 10, 11 >
< START U >
<U , B, 20, 21>
<T , C, 30, 31>
<U , D, 40, 41>
< COMMIT U >
< T , E, 50, 51 >
< COMMIT T >

Describe the action of the recovery manager, including changes to both disk and the log, if there is a crash and the last log record to appear on disk is

1. < START U >
2. < COMMIT U >
3. <T, E, 50, 51 >
4. < COMMIT T >

(Exercise 17.4.3)

Question 2: (3 points)

A transaction T_1, executed by an airline-reservation system, performs the following steps: (0.5 mark for each sub question)

1. The customer is queried for a desired flight time and cities. Information about the desired flights is located in database elements (perhaps disk blocks) A and B, which the system retrieves from disk.
2. The customer is told about the options, and selects a flight whose data, including the number of reservations for that flight is in B. A reservation on that flight is made for the customer.

3. The customer selects a seat for the flight; seat data for the flight is in the database element C.
4. The system gets the customer's credit-card number and appends the bill for the flight to a list of bills in database element D.
5. The customer's phone and flight data is added to another list on database element E for a fax to be sent confirming the flight.

Express transaction T_1 as a sequence of r and w actions. (Exercise 18.1.1)

Question 3: (3 points)

For each of the following schedules:

1. $r_1(A); r_2(A); r_3(B); w_1(A); r_2(C); r_2(B); w_2(B); w_1(C)$
2. $r_1(A); w_1(B); r_2(B); w_2(C); r_3(C); w_3(A)$
3. $w_3(A); r_1(A); w_1(B); r_2(B); w_2(C); r_3(C)$

1. What is the precedence graph for the schedule?
2. Is the schedule conflict-serializable?

(Exercise 18.2.4)

Solution Submission The table below shows which student should submit the assignment to which TA.

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