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Unit Code: FIT2094

Applied Class No: Tutorial #1 (Monday) 11:00 - 13:00

Comments for your marker:

All cell entries have the form S(Tn) to represent a shared lock by Tn, X(Tn) to represent an exclusive lock by Tn and Tn wait Tm to represent a wait of Tn due to Tm (where n and m are transaction numbers)

(a)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TIME** | **TRANS** | **ACTION** | **A** | **B** | **C** | **D** |
| **0** | **T1** | **UPDATE A** | X(T1) |  |  |  |
| **1** | **T1** | **UPDATE B** |  | X(T1) |  |  |
| **2** | **T2** | **READ C** |  |  | S(T2) |  |
| **3** | **T2** | **READ D** |  |  |  | S(T2) |
| **4** | **T3** | **UPDATE A** | T3 wait T1 |  |  |  |
| **5** | **T2** | **UPDATE C** |  |  | X(T2) |  |
| **6** | **T1** | **ROLLBACK** | X(T3) |  |  |  |
| **7** | **T3** | **UPDATE C** |  |  | T3 wait T2 |  |
| **8** | **T2** | **UPDATE B** |  | X(T2) |  |  |
| **9** | **T2** | **UPDATE A** | T2 wait T3 |  |  |  |

* Does a deadlock exist in this transaction sequence?

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| Yes, it exists in the transaction sequence above. |

* Explain why you came to this conclusion.

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| During TIME 7, T3 is waiting for T2 to release and let go of the exclusive lock on C to update C but during TIME 9, T2 is waiting for T3 to release and let go of the exclusive lock on C to proceed with updating B. Since T3 waits for T2 and in turn T2 also waits for T3 so in conclusion, both T2 and T3 are waiting for the opposite side to release the exclusive lock which they won’t as they need the opposite side to release the lock to proceed with updating their columns hence, a deadlock exists. |

(b)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TRL ID** | **TRX NUM** | **PREV PTR** | **NEXT PTR** | **OPERATION** | **TABLE** | **ROW ID** | **ATTRIBUTE** | **BEFORE VALUE** | **AFTER VALUE** |
| 101 | 601 | Null | 102 | \*\*\*\*Start of transaction  START | Null | Null | Null | Null | Null |
| 102 | 601 | 101 | 103 | UPDATE | PRODUCT | ABC | PROD\_QOH | 1205 | 1206 |
| 103 | 601 | 102 | 104 | UPDATE | PART | A | PART\_QOH | 567 | 566 |
| 104 | 601 | 103 | 105 | UPDATE | PART | B | PART\_QOH | 98 | 97 |
| 105 | 601 | 104 | 106 | UPDATE | PART | C | PART\_QOH | 549 | 548 |
| 106 | 601 | 105 | Null | COMMIT  \*\*\*\*End of transaction | Null | Null | Null | Null | Null |