**Tutorial 09**

# IE2042 – Database Management Systems for Security Semester 1, 2021

1. Consider the following schedule which uses Strict 2PL protocol.

|  |  |  |  |
| --- | --- | --- | --- |
| **T1** | **T2** | **T3** | **T4** |
|  |  |  |  |
| S(A) |  |  |  |
| R(A) |  |  |  |
|  | X(B) |  |  |
|  | W(B) |  |  |
| S(B) |  | S(C) |  |
|  |  | R(C) |  |
|  | X(C) |  |  |
|  |  |  | X(B) |

1. Determine whether a deadlock exists in the above schedule. Explain how you obtained the answer.
2. If a deadlock has occurred, how does the DBMS resolve the deadlock
3. Briefly explain what is the phantom problem?
4. How does the DBMS avoid the phantom problem?

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1. Consider the given B+ tree. Follow the simple tree locking algorithm to perform the activities given below.
   1. Search 11
   2. Insert 30
   3. Delete 99

