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# COMP9315 20T1 Final Exam Q7

Type your answer(s) to replace the xxx's
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T1: R(X) W(X)           R(Y)                 W(Y)
T2:           R(Y)           R(X) W(Y)           W(X)
T3:                R(X)                R(Y)           W(X) W(Y)


a. Conflict serializability

- Precedence graph:

  +------+
  |      |
  |      |
  |  +-- T1 <----+
  |  |   ^       |
  |  |   |       |
  |  +-> T2 <-+  |
  |      |    |  |
  |      v    |  |
  +----> T3 --+  |
         |       |
         |       |
         +-------+

- Edges:
  - Edge from T1 to T2, as T1 must do R(X) before T2 does W(X)
  - Edge from T1 to T3, as T1 must do R(X) before T3 does W(X)
  - Edge from T2 to T1, as T2 must do R(Y) before T1 does W(Y)
  - Edge from T2 to T3, as T2 must do R(Y) before T3 does W(Y)
  - Edge from T3 to T1, as T3 must do R(Y) before T1 does W(Y)
  - Edge from T3 to T2, as T3 must do R(X) before T2 does W(X)

- There are cycles everywhere (e.g.,  T1 T2 T3 T1), so the schedule
is not
  conflict serializable

b.  View serializability

- Need  to  find a serial schedule that is view equivalent to the
original
  schedule
- In any serial schedule that is view equivalent to the original
schedule,
  T1 must be executed first, because in the original schedule, both
T2 and
  T3 read the value of X written by T1
- In any serial schedule that is view equivalent to the original
```

schedule,
  T2 must be executed before T3, because in the original schedule T3 reads
  the value of Y written by T2
- So now, the only schedule that could possibly be view equivalent to the
  original schedule is T1 T2 T3.

- This is T1 T2 T3:

```
  T1: R(X) W(X) R(Y) W(Y)
  T2:                   R(Y) R(X) W(Y) W(X)
  T3:                                        R(X) R(Y) W(X) W(Y)
```

- This is the original schedule:

```
  T1: R(X) W(X)           R(Y)                W(Y)
  T2:           R(Y)           R(X) W(Y)           W(X)
  T3:                R(X)                R(Y)           W(X) W(Y)
```

- These schedules are not view equivalent, because in T1 T2 T3, T3 reads
  the value of X written by T2, while in the original schedule, T3 reads
  the value of X written by T1.

- Hence, the schedule is not view serializable.