Databases Autumn 2025

Hand-In Exercise 6

December 14, 2025

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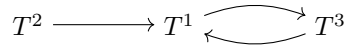Luis Tritschler

Total Points	

Task	Points

Databases
Autumn 2025
Exercise 6

Task 1

Task 2

a) This is the dependency graph of this schedule:

$$T^2 \longrightarrow T^1 \rightleftarrows T^3$$

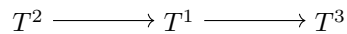   i) **CPSR:**

      Cycle in dependency graph $\Rightarrow$ not conflict-serializable $\Rightarrow S_4 \notin$ CPSR.

   ii) **OPSR and COPSR:**

      COPSR $\subseteq$ OPSR $\subseteq$ CPSR $\Rightarrow S_4 \notin$ OPSR and $S_4 \notin$ COPSR.

b) This is the dependency graph of this schedule:

$$T^2 \longrightarrow T^1 \longrightarrow T^3$$

   i) **CPSR:**

      Acyclic dependency graph $\Rightarrow$ conflict-serializable $\Rightarrow S_5 \in$ CPSR.
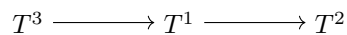
   ii) **COPSR:**

      Commit order is C_2 before C_1 before C_3 and dependencies $T^2 \rightarrow T^1 \rightarrow T^3 \Rightarrow$ commit-order preserved $\Rightarrow S_5 \in$ COPSR.

   iii) **OPSR:**

      COPSR $\subseteq$ OPSR $\Rightarrow S_5 \in$ OPSR.

c) This is the dependency graph of this schedule:

$$T^3 \longrightarrow T^1 \longrightarrow T^2$$

   i) **CPSR:**

      Acyclic dependency graph $\Rightarrow$ conflict-serializable $\Rightarrow S_6 \in$ CPSR.

   ii) **COPSR:**

      Dependency $T^1 \rightarrow T^2$ exists but commit order is C_2 before $C_1 \Rightarrow$ commit-order violation $\Rightarrow S_6 \notin$ COPSR.

   iii) **OPSR:**

      Serial order enforced by graph is T^3 before T^1 before T^2 but the real-time order is T^2 before $T^3 \Rightarrow$ order mismatch $\Rightarrow S_6 \notin$ OPSR.

Task 3