

Tutorial 9

Question 1 Consider two transactions T1 and T2, which are concurrently executed as follows:

Time	T1	T2
1	R(y)	
2		R(y)
3	$y = y + 50$	
4		$y = y \times 3$
5	W(y)	
6		W(y)
7		

Assume that no concurrency control protocol is used and initially $y=20$. Answer the following questions:

- A.** What is the possible correct value(s) of y when executing the above transactions under a serial schedule?
- T1 followed by T2
 - T2 followed by T1
- B.** What would be the actual value of y at time 7?
- C.** What type of concurrency anomaly has occurred due to the above execution? Briefly explain that anomaly.

Question 2 Consider the following schedule S, which is generated by some concurrency control protocol for executing two transactions T1 and T2:

$S = T1:R(X), T2:R(X), T1:W(X), T2:W(X), T1:Commit, T2:Commit$

For each of the following concurrency control protocols:

- State if the protocol allows schedule S, that is, allows the actions to occur in exactly the order shown in schedule S;
- Clearly explain the reason why schedule S is allowed or not allowed under that protocol.

INFS2200/7903 – Relational Database Systems

School of Information Technology and Electrical Engineering (ITEE), UQ

A. Under the **Basic 2PL** protocol.

B. Under the **Conservative 2PL** protocol.

Question 3 Consider a database with objects X and Y and assume that there are two transactions T1 and T2. Transaction T1 reads objects X and Y and then writes objects X and Y. Transaction T2 reads objects Z and X and then writes object X.

For each of the following schedules:

- Mention and explain the type of **anomaly** that might occur in that schedule;
- Show that modifying that schedule according to **Strict 2PL** will prevent such anomalies.

A. T1:R(X), T1:R(Y), T2:R(Z), T1:W(X), T2:R(X), T1:W(Y), T2:W(X)

B. T2:R(Z), T2:R(X), T1:R(X), T1:R(Y), T1:W(X), T2:W(X), T1:W(Y)