CSCI235: Database Systems

Assignment 2

Nicholas Monteleone 5055076

Task 1

1) Schedule

T1	T2	T3	X: 1, Y: 2, Z: 1
d = read(z)			D: 1
write(y, d+1)			Y: 2
commit			
	a = read(x)		A: 1
	b = read(y)		B: 2
		write(x, 1)	X: 1
	write(x, b-a)		X: 1
	commit		
		c = read(z)	C: 1
		write(z, c+2)	Z: 3
		commit	

Equivalent serial execution

T1	T2	T3	X: 1, Y: 2, Z: 1
d = read(z)			D: 1
write(y, d+1)			Y: 2
commit			
	a = read(x)		A: 1
	b = read(y)		B: 2
	write(x, b-a)		X: 1
	commit		
		write(x, 1)	X: 1
		c = read(z)	C: 1
		write(z, c+2)	Z: 3
		commit	

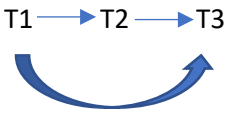
The schedule is view serializable as it is view equivalent to serial order T1 -> T2 -> T3.

- Initial read of data values is the same as current schedule.
- Final write of all data values are the same (T3 write(x) = 1, T2 write(x) = 1)
- Final read of all data values are the same as current schedule.

T2 write(x) and T3 write(x), and T2 read(x) and T3 write(x) are in conflict, and the system is cyclic (T1 -> T2 -> T3 -> T2 …etc.) therefore the system is not conflict serializable.

2) Schedule

T1	T2	T3	X: 1, Y: 2, Z: 1
	A = read(X)		A: 1
D = read(Z)			D: 1
write(Y, D+1)			Y: 2
commit			
	B = read(Y)		B: 2
	write(X, B-A)		X: 1
	commit		
		C = read(Z)	C: 1
		write(X, 1)	X: 1
		commit	



Schedule is conflict serializable as the system is acyclic and there are no conflicts. Schedule is not order-preserving serializable because T2 occurs first in the schedule but the serialization order is T1 -> T2 -> T3 as shown above.