Homework 4 Write your name here:_____

1. (20 points) Consider a database that has two integer objects, A and B. DBMS is given two programs:

P1	P2
A = A + 1 B = B + 1	A = B B = B + 1

Before the program is execution, A = 0 and B = 0. For each of the following schedules, determine if it is a serializable schedule. You must explain why.

S1

T1	T2
A = A + 1 B = B + 1	A = B B = B + 1

S2

T1	T2
A = A + 1 B = B + 1	 A = B B = B + 1

S3

T1	T2
A = A + 1 B = B + 1	A = B B = B + 1

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2. (20 points) Consider the following two programs.

P1	P2
R(A)	W(A)
R(C)	R(B)
W(C)	W(B)
c/o	c/o

For each of the following execution, determine if it is a schedule, a serial schedule, and/or a strict schedule. You must explain why.

S1

T1	T2
R(A)	
	W(A)
R(C)	
	R(B)
W(C)	
	W(B)
c/o	
	c/o

S2

T1	T2
R(A)	
R(C)	
W(C)	
	W(A)
c/o	
	R(B)
	W(B)
	c/o

S3

T1	T2
R(A)	
R(C)	
W(C)	
c/o	
	W(A)
	R(B)
	W(B)
	c/o

S4

T1	T2
	W(A)
R(A)	
W(C)	
c/o	
	R(B)
	W(B)
	c/o

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3. (60 points) Consider the following two schedules implemented by strict 2PL.

S1

T1	T2
S(A)	
R(A)	
X(A)	
W(A)	
commit	
	S(A)
	R(A)
	commit

S2

T1	T2
S(A)	
R(A)	
	S(A)
	R(A)
X(A)	
	commit
W(A)	
commit	

Recall strict 2PL is implemented with a lock table to keep 1) which data object is locked; 2) which transaction owns which lock; 3) which transaction is waiting for a lock on this object.

Lock table

Data	*Lock*	*Owner*	*Waiting*

For each of the two schedules, explain how the status of the lock table changes as the actions are executed. The table is assumed to be empty initially.

Please use Microsoft Words or other tools to type your answer. Don't handwrite. Submit your work through your Canvas account.