Assignment 3

Due date: March 13, 2002 **Due in class**

Question 1:

List of all possible schedules and determine which ones are conflict serializable using a dependency graph, based on the following transactions.

Transaction T1:	Transaction T2:
read(X);	read(X);
write(X);	write(X);
read(Y);	
write(Y);	

Question 2

Consider the following two schedules:

Schedule1:
T1:R(A), T2:R(C), T3:R(B), T1:R(B), T3:W(B), T3:COMMIT,
T1:W(A),T2:R(A),T2:W(A), T2:COMMIT,T1:W(B), T1:COMMIT.

Schedule2:
T1:R(C), T2:R(A),T1:R(A),T1:R(B),T3:R(B),T2:W(A), T2:R(C), T1:W(A), T1:W(B), T1:COMMIT,T3:W(B),T3:COMMIT, T2:W(C), T2:COMMIT

1- Represent the schedules horizontally or vertically as seen on the slides in class adding also the lock requests, and give the wait-for graph for each schedule.

2- Assume Strict 2 Phase Locking and given the following two deadlock resolution mechanisms: (1): Wait-Die; (2): Wound-Wait; (3): timestamp ordering.

The priorities of T1,T2,T3 satisfy T1>T2>T3. Aborted transactions are restarted immediately.

For each schedule: construct the real schedules which show how the transactions will be executed under the deadlock resolution mechanisms:

a- Wait-Die;
b- Wound-Wait;
c- timestamp ordering.

Question 3:

Assume a Steal/Force strategy. Calculate the total execution time given the following transactions with their respective execution time executed in the following order: T1, T2, T3, T4. The Checkpoint and crash information are also provided. Checkpoints contain active transactions and dirty pages.
The undo operation of a transaction takes the same time it took to execute the transaction to the point of the crash. After the crash, the analysis phase of the Aries algorithm takes 3 seconds. If you have to redo anything from the transaction, assume you have to redo the whole transaction.

T1 20 sec.
T2 10 sec.
T3 5 sec.
T4 6 sec.

(1)

Checkpoint at 30 sec
Crash after 32 sec

(2)

Checkpoint at 30 sec
Crash after 28 sec

Recalculate the execution time if the strategy is now No-Steal/No-Force. The checkpoint contains dirty pages written by T1.