CSE 4/562 — Spring 2018 — Homework 3

Due:

1 ARIES

Implement ARIES to recover the system with the following log file:

LSN	TID	PrevLSN	Entry
1	T1	0	Update P1 from 1 to 2
2			Begin Checkpoint
3	T2	0	Update P2 from 2 to 3
4			End Checkpoint, Transaction Table=$\{(T1, 1)\}$, Dirty Page Table=$\{(P1, 2)\}$
5	T1	1	Commit
6	T2	3	Update P3 from 2 to 4
7	T1	5	End Transaction
8	T3	0	Update P4 from 5 to 2
9	T3	8	Abort
10	T3	10	Undo T3 LSN 8, Next Undo=0
	CRASH		

1.1 Analysis

Show the transaction table and dirty page table after completing the analysis phase

Transaction Id	LSN
T2	6
T3	10

Page	Sequence Number
P1	1
P2	3
P3	6
P4	8

1.2 Redo

List the writes that will be performed in the redo phase

Page	Value
P1	2
P2	3
P3	4
P4	2
P4	5

1.3 Undo

Show the new entries in the log file after the undo phase

LSN	TID	PrevLSN	Entry
12	T3	11	End Transaction
13	T2	6	Abort
14	T2	13	Undo T2 LSN, Next Undo=0
15	T2	14	End Transaction

2 Transactions

2.1 Precedence Graph

Draw the precedence graph for the following transaction schedule:

T_1	T_2	T_3	T_4
W(A)			
W(B)			
	R(B)		
			W(C)
		R(C)	
W(C)			
			R(B)
	W(C)		

$T_1 -> T_2$
$T_4 -> T_3$
$T_1 -> T_4$
$T_4 -> T_2$
$T_4 -> T_1$
$T_3 -> T_1$

Is the schedule conflict serializable? Is the schedule view serializable? Explain your answers.