

Transaction 1:

INPUT(X)
INPUT(Y)
READ(X,t)
t := t+1
WRITE(X,t)
READ(Y,t)
t := t-1
WRITE(Y,t)
OUTPUT(X)
OUTPUT(Y)

Transaction 2:

INPUT(Z)
INPUT(W)
READ(Z,s)
s := s+1
WRITE(Z,s)
READ(W,s)
s := s-1
WRITE(W,s)
OUTPUT(Z)
OUTPUT(W)

Transaction 3:

INPUT(X)
INPUT(Y)
READ(X,t)
t := t+1
WRITE(X,t)
READ(Y,t)
t := t-1
WRITE(Y,t)
OUTPUT(X)
OUTPUT(Y)

Tasks:

1. Fill in the log entries for transactions 2 and 3. The appropriate spots for transaction 2 are indicated by an outlined box.
2. Fill in the appropriate values for the buffers and variables in memory where there are omissions.
3. Suppose that there is a crash after line 39 but before line 40. Using the state of the disk at line 39 and the log up to that point, determine how the database would be returned to a consistent state during the recovery process.

Undo/Redo Logging

[illegible]

42			INPUT(X)		7	6	5	7	4	6	5	7	4	6
43														
44			INPUT(Y)						4	6			4	6
45														
46			READ(X,t)						4	6			4	6
47														
48			t := t+1						4	6			4	6
49														
50			WRITE(X,t)						4	6			4	6
51														
52			READ(Y,t)						4	6			4	6
53														
54			t := t-1						4	6			4	6
55														
56			WRITE(Y,t)						4	6			4	6
57														
58			OUTPUT(X)						4	6			4	6
59														
60			OUTPUT(Y)						4	6			4	6
61														
					6	6	6	6	4	6	6	6	4	6

Recovery after 39:

[illegible]