Bill Yang | Due: 5/8/20

Homework 11

CS386D Database Systems | Instructor: Daniel Miranker

1 Part 1

1

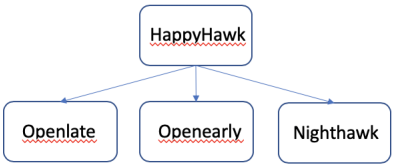
a) Openlate(r) $<-$ Restaurant(r, d1, _, c1) AND Restaurant(r, d2, _, c2) AND d1 = Friday AND d2 = Saturday AND c1 > 9:00PM AND c2 > 9:00PM

b) Openearly(r) $<-$ Restaurant(r, d1, o1) AND Restaurant(r, d2, o2) AND d1 = Saturday AND d2 = Sunday ANd o1 < 8:00AM ANd o2 < 8:00AM

Happyhawk(p) $<-$ Nighthawks(p, r1) AND Nighthawks(p, r2) AND Openlate(r1) AND Openearly(r2)

2

a)



b) No

c) Before: HappyHawk({}),
OpenLate({Unos 360}),
OpenEarly({}),
Nighthawks({(Dan, UNOs 360), (Tom, UNOs 360), (Tom, Magnolia Cafe)})

After: HappyHawk({ Tom })
OpenLate({Unos 360,Magnolia Cafe}),
OpenEarly({Magnolia Cafe}),
Nighthawks({(Dan, UNOs 360), (Tom, UNOs 360), (Tom, Magnolia Cafe)})

3

Fenves	Goldbart
Fenves	Wood
Goldbart	Fussell
Goldbart	Beckner
Wood	Tewfik
Fussell	Miranker
Fussell	Mok
Beckner	Alcook
Tewfik	Ghosh

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Fussell	Mok
Beckner	Alcook
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Fenves	Fussell
Fenves	Beckner
Fenves	Tewfik
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Goldbart	Mok
Goldbart	Alcook
Wood	Ghosh
Fenves	Miranker
Fenves	Mok
Fenves	Alcook
Fenves	Ghosh

2 Part 2

17.4.1
A = 5, B = 10
a) $A := A + B; B := A + B;$
<Start T > < $T, A, 5, 15$ > < $T, B, 10, 25$ > <Commit T >
b) $B := A + B; A := A + B$
<Start T > < $T, B, 10, 15$ > < $T, A, 5, 20$ > <Commit T >
c) $A := B + 1; B := A + 1$
<Start T > < $T, A, 5, 11$ > < $T, B, 10, 12$ > <Commit T >

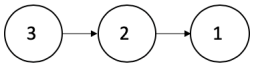
17.4.3 b, d
b) Undo transaction T by writing or making sure that $C = 30$, $A = 10$ on disk in that order. Add to log < T, abort>.
Redo transaction U by writing or making sure that $B = 21$, $D = 41$ on disk in that order.
d) Redo transaction T and U by writing or making sure that $A = 11$, $B = 21$, $C = 30$, $D = 41$, $E = 51$ on disk in that order.

17.4.4 per 17.4.3 b only
b) U has been committed. By undo/redo-logs, values can be written to disk before or after the commit happens, thus all values changed by U may or may not appear on disk. $B = 20$ or 21, $D = 40$ or 41.
T has not been committed. Technically since a value can be written to disk before or after a commit, and can only be written as long as its log has been recorded, $A = 10$ or 11, $C = 30$ or 31, $E = 50$. E does not have a log entry, so it could not have been changed. A very proactive manager may have already written A and C, but it is possible that they were not yet. We would not know without

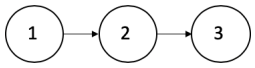
understanding the crash manager.

18.1.1 a, b, c
$r(A); r(B); w(B); r(C); w(C); r(D); w(D); r(E); w(E);$

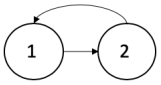
18.2.4 a, b, d
a) i. $2 < 1$, $3 < 2$



ii. Yes, T_3, T_2, T_1
iii. No
b) i. $1 < 2$, $2 < 3$, $1 < 3$



ii. Yes, T_1, T_2, T_3
iii. No
d) i. $1 < 2$, $2 < 1$



ii. No
iii. No

18.3.3 per b and d
b) The locking scheduler would keep the schedule as it is. No element is accessed twice in the same transaction so the lock is locked and unlocked immediately every action.
d) $w_2(B)$ would get delayed until $r_1(B)$ executes and unlocks the lock. The new schedule would be (without the locks and unlocks):
$r_1(A); r_2(A); w_1(B); r_1(B); w_2(B); r_2(B); w_2(C); w_1(D);$