

Übungsblatt 8

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Aufgabe 1

a.

```
<T1.bot,T2.bot,T3.bot, T1.slock(A), T1.r(A), T2.slock(B), T2.r(B), T1.xlock(D),  
,T1.r(D), T3.slock(C), T3.r(C), T2.xlock(C), T2.r(C), T3.xlock(D), T3.r(D), T1.r(B), T1.w(A),  
T1.unlock(A), T1.unlock(D), T2.w(B), T2.unlock(B), T3.w(C), T3.unlock(C), T3.unlock(D), T3.c, T2.c, T1.c>
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Aufgabe 2

- a. Isolationslevel SERIALIZABLE
- b. Isolationslevel READ COMMITTED
- c. Isolationslevel READ UNCOMMITTED

Aufgabe 3

a.

- $P1\{A, B\}$
- $P2\{C, D, E, F\}$
- $P3\{G, H, I, J\}$

Zeitpunkt 48: $P1\{A = 10, B = 12\}$, $P2\{C = 11, D = 6, E = 8, F = 10\}$, $P3\{G = 10, H = 14, I = 16, J = 22\}$ - Winner-Transaktionen: T1, T3 (T1 und T3 sind commitet @Zeile 56, 57) - Loser-Transaktionen: T2, T4

Zeitpunkt	Protokoll	Kommentar
58	<#58, T2, P3, J = J-9, J = J+9, #55>	UNDO from #55
59	<#59, T4, P3, I = I-1, I = I+1, #54>	UNDO from #54
60	<#60, T2, P2, D = D-2, D = D+2, #53>	UNDO from #53
61	<#61, T1, P1, A = A-5, A = A+5, #52>	REDO from #52
62	<#62, T4, P3, F = F+1, F = F-1, #51>	UNDO from #51
63	<#63, T3, P3, H = H+1, H = H-1, #50>	REDO from #50

b.

Zeitpunkt	Protokoll	Kommentar
48	<#48, CHECKPOINT>	

Zeitpunkt	Protokoll	Kommentar
49	<#49, T4, begin TA,0>	
50	<#50, T3, P3, H = H+1, H = H-1, #47>	REDO
51	<#51, T4, P3, F = F-1, F = F+1, #49>	UNDO
52	<#52, T1, P1, A = A-5, A = A+5, #42>	REDO
53	<#53, T2, P2, D = D+2, D = D-2, #46>	UNDO
54	<#54, T4, P3, I = I-1, I = I+1, #51>	UNDO
55	<#55, T2, P3, J = J+9, J = J-9, #53>	UNDO
56	<#56, T1, commit, #52>	
57	<#57, T3, commit, #50>	

c.

Werte nach Wiederherstellung: from #52: P1: A-5 > 10-5=5 from #53: P2: D+2 > 6+2=8 from #54: P3: I-1 > 16-1=15 from #55: P3: J+9 > 22+9=31

=> P1 = {A=5. B=12} P2 = {C=11. D=8, E=8, F=10} P3 = {G=10, H=14, I=15, J=31}