UNIVERSITÄT DES SAARLANDES
Fachrichtung 6.2 – Informatik
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8. Übung zur Vorlesung *Transaktionsorientierte Informationssysteme* im Sommersemester 2000

8.1. Let $s_1=w_1(x)\ w_1(y)\ r_2(u)\ w_2(x)\ r_2(y)\ w_2(y)\ a_2\ w_1(z)\ c1$ and

$s_2=w_1(x)\ w_1(y)\ r_2(u)\ w_2(x)\ r_2(y)\ w_2(y)\ w_1(z)\ a_1\ c_2$.

Determine $exp(s_1)$ and $exp(s_2)$ as well as the corresponding reductions.

8.2. Which of the properties RC, ST, RG, PRED, and LRC are satisfied by the following schedules:

$s_1=r_1(a)\ r_2(a)\ w_1(a)\ c_1\ c_2$

$s_2=r_1(a)\ w_1(a)\ r_2(b)\ w_2(b)\ w_2(a)\ c_2\ c_1$

$s_3=r_1(a)\ incr_2(a)\ incr_2(b)\ incr_3(b)\ c_3\ a_2\ c_1$

Some of the above properties cannot be applied to a schedule with operations other than read and write, such as schedule s_3 above. Try to define generalizations of these properties to flat object schedules with arbitrary operations.

8.3. For each of the following histories determine to which of the classes RC, ACA, or ST it belongs:

$s_1 = w_1(x)\ r_2(y)\ r_1(x)\ c_2\ r_2(x)\ w_2(y)\ c_2$

$s_2 = w_1(x)\ r_2(y)\ r_1(x)\ r_2(x)\ c_1\ w_2(y)\ c_2$

$s_3 = w_1(x)\ r_2(y)\ r_2(x)\ r_1(x)\ c_2\ w_1(y)\ c_1$

8.4. Prove theorem 11.35 stating that Gen(SS2PL)=RG.

8.5. Consider an implementation of transaction recovery that makes use of transaction-private workspaces in that all updates are initially executed on such workspaces and thus deferred until the transaction's commit as far as the shared, persistent data is concerned. Upon the commit of a transaction, the workspace updates would be re-executed against the shared data; upon a transaction abort, the workspace would be discarded.

Is it possible to apply the notions of ST, PRED, and LRC to such a workspace-based deferred-update implementations? Is it meaningful? If appropriate, try to redefine these properties for a deferred-update setting.