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

1.1. Consider the following histories:

$s = r_1(x)\ r_2(y)\ w_1(y)\ r_3(z)\ w_3(z)\ r_2(x)\ w_2(z)\ w_1(x)\ c_1\ c_2\ c_3$
$s' = r_3(z)\ w_3(z)\ r_2(y)\ r_2(x)\ w_2(z)\ r_1(x)\ w_1(y)\ w_1(x)\ c_3\ c_2\ c_1$

Compute *H[s]* and *H[s']* as well as the respective RF and LRF relations. Show the step graph of these histories.

1.2. Suppose that in a given schedule the functions corresponding to the write steps represent increments of a counter, i.e., f(x) = x + 1. Compute the (Herbrand) semantics of the following schedules using this semantic information:

$s = r_1(y)\ r_2(y)\ w_1(y)\ r_3(z)\ w_3(z)\ r_2(x)\ w_2(x)\ w_1(x)\ c_1\ c_2\ c_3$
$s' = r_3(z)\ w_3(z)\ r_2(y)\ r_2(x)\ w_2(y)\ r_1(x)\ w_1(x)\ c_3\ c_2\ c_1$

[*Note*: Strictly speaking, this is no longer a Herbrand semantics, since some function symbols in *H[s]* are now interpreted.]

1.3. Consider $s = r_1(x)\ w_1(x)\ r_2(x)\ r_2(y)\ w_2(y)\ c_2\ w_1(y)\ c_1$. Show that $s \in$ FSR \ VSR.

1.4. Consider the following history:

$s = r_1(x)\ r_3(x)\ w_3(y)\ w_2(x)\ r_4(y)\ c_2\ w_4(x)\ c_4\ r_5(x)\ c_3\ w_5(z)\ c_5\ w_1(z)\ c_1$

Show that $s \in$ FSR.

1.5. Show that VSR = CSR in the absence of "blind writes", i.e., if each write step of object *x* is preceded by a read step on *x* by the same transaction.

1.6. Let $s = r_1(z)\ r_3(x)\ r_2(z)\ w_1(z)\ w_1(y)\ c_1\ w_2(y)\ w_2(u)\ c_2\ w_3(y)\ c_3$.
Show $s \in$ VSR \ CSR.

1.7. Consider $s = r_1(x)\ w_1(z)\ r_2(z)\ w_1(y)\ c_1\ r_3(y)\ w_2(z)\ c_2\ w_3(x)\ w_3(y)\ c_3$. Using the conflict graph of *s* as an argument, show that $s \in$ CSR. Does $s \in$ OCSR also hold?

Achtung Termin- und Raumänderung: Die Übung findet jetzt donnerstags von 16-18 Uhr in Raum 306, Gebäude 36 statt!