# HW 5 part 1

Monday, November 16, 2020 7:41 PM

Part 1. objects X Y Z

T1: $R_1(X)$ $R_1(Y)$ $W_1(X)$

T2: $R_2(X)$ $R_2(Y)$ $W_2(Y)$ $R_2(X)$ $R_2(Y)$ $W_2(X)$ $R_2(Z)$ $W_2(Z)$

1. Dirty Read Anomaly $W_i(E)$ $R_j(E)$

| $T_1$ | $T_2$ |
|---|---|
| $R_1(X)$ | |
| $R_1(Y)$ | |
| $W_1(X)$ | |
| | $R_2(X)$ |
| | $R_2(Y)$ |
| | $W_2(Y)$ |
| | $R_2(X)$ |
| | $R_2(Y)$ |
| | $W_2(X)$ |
| | $R_2(Z)$ |
| | $W_2(Z)$ |

Dirty Read ⇒ Here T2 reads object X that has been modified but not committed by T1

Lost update: $W_i(E)$ $W_j(E)$

2. Unrepeatable read Anomaly $R_i(E)$ $W_j(E)$

| $T_1$ | $T_2$ |
|---|---|
| $R_1(X)$ | |
| $R_1(Y)$ | |
| | $R_2(X)$ |
| $W_1(X)$ | |
| | $R_2(Y)$ |
| | $W_2(Y)$ |
| | $R_2(X)$ |
| | $R_2(Y)$ |
| | $W_2(X)$ |
| | $R_2(Z)$ |
| | $W_2(Z)$ |

Unrepeatable Read ⇒ Here $T_1$ modifies object after $T_2$ reads it. This means that $T_2$ will not be able to get the same value when it reads X again.

3. Lost Update Anomaly $W_1(E)$ $W_2(E)$

| $T_1$ | $T_2$ |
|---|---|
| | $R_2(X)$ |
| | $R_2(Y)$ |
| | $W_2(Y)$ |
| | $R_2(X)$ |
| | $R_2(Y)$ |
| $R_1(X)$ | |
| $R_1(Y)$ | |
| $W_1(X)$ | |
| | $W_2(X)$ |
| | $R_2(Z)$ |
| | $W_2(Z)$ |

Lost update ⇒ Here $T_1$ modifies X, but its modification is immediately overwritten by a $T_2$ write. This results in $T_1$'s modification being "lost".