Data Bases II
Warm Restart

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Exercise F.1

Describe the warm restart, indicating the progressive construction of the sets UNDO and REDO, and the recovery actions, given the following log configuration:

$$\mathrm{DUMP}, b(t_1), b(t_2), b(t_3), i(t_1, o_1, a_1), d(t_2, o_2, b_2),$$

$$b(t_4), u(t_4, o_3, b_3, a_3), u(t_1, o_4, b_4, a_4), c(t_2),$$

$$\mathrm{CKPT}(t_1, t_3, t_4), b(t_5), b(t_6), u(t_5, o_5, b_5, a_5), a(t_3),$$

$$\mathrm{CKPT}(t_1, t_4, t_5, t_6), b(t_7), a(t_4), u(t_7, o_6, b_6, a_6),$$

$$u(t_6, o_3, b_7, a_7), b(t_8), a(t_7), \mathrm{FAILURE}$$

Note: we are using the following notation
- $b(t) = t$ begins
- $i(t, o, a) = t$ inserts an object o with value a
- $u(t, o, b, a) = t$ updates o from value b to value a
- $d(t, o, b) = t$ deletes o, which had value b
- $a(t) = t$ aborts
- $c(t) = t$ commits
- $\mathrm{CKPT}(t_i, ..., t_j) = t_i$ to t_j are alive at a checkpoint

Exercise F.2

Same as before.

$$\mathrm{DUMP}, b(t_1), u(t_1, o_1, b_1, a_1), b(t_2), b(t_3),$$

$$u(t_3, o_3, a_3, b_3), i(t_2, o_2, a_2), c(t_2), \mathrm{CKPT}(t_1, t_3),$$

$$c(t_3), b(t_4), u(t_4, o_2, b_4, a_4), u(t_4, o_3, b_5, a_5), b(t_5),$$

$$i(t_5, o_6, a_6), a(t_1), c(t_4), u(t_5, o_7, b_7, a_7),$$

$$d(t_5, o_1, b_8), \mathrm{FAILURE}$$