Exercises for *Transaction Systems*, summer term 2017
Linnea Passing (linnea.passing@tum.de)
http://www-db.in.tum.de/teaching/ss17/transactions/

Sheet No. 5

Info
- Due date: Friday, June 23, 3pm.
- Please send your solution via e-mail, and prefix the subject with [transactions].
- Please include your Matrikelnummer and your name.

Exercise 1 (5 points) Under the 2PL protocol it is possible for transactions to “starve” in the following sense: A transaction gets involved in a deadlock, is chosen as the victim and aborted. After a restart, it again gets involved in a deadlock, is chosen as the victim and aborted, and so on. Provide a concrete example for such a situation, and describe how 2PL could be extended in order to avoid starvation of transactions.

Exercise 2 (5 points) Show that the wait-die and wound-wait approaches to deadlock prevention both guarantee an acyclic WFG at any point in time.

Exercise 3 (10 points) Consider the following input schedules to the O2PL protocol:
\[
s_1 = w_1(x) \ r_2(x) \ c_2 \ r_3(y) \ c_3 \ w_1(y) \ c_1
\]
\[
s_2 = w_1(x) \ r_2(x) \ r_3(y) \ c_3 \ r_2(z) \ c_2 \ w_1(y) \ c_1
\]
Which are the corresponding output schedules produced by O2PL? For each of the two schedules, give the details about when locks are requested, granted, attempted to be released, and eventually released.

Exercise 4 (5 points) Show that O2PL is susceptible to deadlocks (i.e., it is not deadlock free).