

CS54200: Distributed Database Systems
Prof. Bharat Bhargava

Homework 2
Due date: February 14, 2017

Note: Written homework assignments are due at the beginning of class on the due date. Answer each question briefly.

Q1: Comment on the suitability of using variations of: (a) locking, (b) time stamps, and (c) versions for concurrency control. You may use examples.

Q2: What are the different ideas for increasing the degree of concurrency? You may give examples.

Q3: Read the following paper: [*A Model for Adaptable Systems for Transaction Processing*](#), Bharat Bhargava and John Riedl, IEEE Transactions on Knowledge and Data Engineering, 1(4), Dec 1989.

- a) What do we mean by adaptability in transaction processing?
- b) Can you switch between timestamp and locking based algorithms? What transformations are needed?

You may give examples.

Q4: Assume that we use centralized control and issue updates to all sites after the transaction has been committed at the central site.

- a) How can we ensure mutual consistency?
- b) What ideas can be used to reduce waiting at other sites?

Q5: Try to read the paper: [*The serializability of concurrent database updates*](#), C. Papadimitriou, Journal of the ACM (JACM), 26(4), 1979.

- a) What are the different performance criteria for evaluating concurrency control algorithms?
- b) What is the difference between class DSR and 2PL?
- c) When DSR is equivalent to SR class of concurrency control?

Q6: Read the paper [*Granularity of Locks and Degrees of Consistency in a Shared Data Base*](#) by J. Gray, R. Lorie, G. Putzolu, I. Traiger. What are advantages and disadvantages of multiple-granularity locks?