CS 54200: Distributed Database Systems
Professor Bharat Bhargava
Homework 1
Due date: January 30, 2020 11:59 PM (EST)

Note: *Submit the written homework via Blackboard. Answer each question briefly*.
Max. Marks: 100

Q1: Write a one-page summary of ideas for three papers identifying the problem and the solution (1-page per paper, 3 pages in total). You may select papers from the reading list, or choose papers outside the list, that you want to read, related to *distributed databases* (such as implementations, concurrency control, reliability, communication network, big data, security/privacy, mobile) or *cloud computing*. Three papers that can give you a quick background are: (30 points)

   a) The Raid Distributed Database System, Bharat Bhargava and John Riedl, IEEE Trans on Software Engineering, 15(6), June 1989.
   b) Concurrency Control in Database Systems Bharat Bhargava, IEEE Trans on Knowledge and Data Engineering,11(1), Jan.-Feb. 1999
   c) Building Distributed Database Systems, Bharat Bhargava.

Q2: Give examples of transaction executions that lead to: (10 points)

   a) lost update
   b) dirty read.

Q3: What makes the problems in a distributed database system different (or complex) as compared to the problems in a single site system? List at least four differences. (20 points)

Q4: Is there any sense in running a: (10 points)

   a) **'Read only'** transaction?
   b) **'Write only'** transaction?

Q5: Discuss the role of the following issues in distributed database system architecture: (15 points)

   a) Autonomy
   b) Heterogeneity
   c) Scalability.

Q6: What are advantages and disadvantages of a replicated database compared with a nonreplicated database? (15 points)