Purdue University  
Computer Science Department  
CS 448: Introduction to Database Systems  
Prof: Bharat Bhargava

CS 448 – Homework #5 (3 points)

Due: 04/05/2018, before class

Reference: Fundamentals of Database Systems, Elmasri and Navathe, 6\textsuperscript{th} or 7\textsuperscript{th} Edition.

Answer all the questions in itemized fashion like the questions.

Question 1 (0.25 point)  
Problem 21.1. (page 808 in 7\textsuperscript{th} edition)  
Or  
Problem 22.1. (page 803 in 6\textsuperscript{th} edition)

• What is the two-phase locking protocol?  
• How does it guarantee serializability?

Question 2 (0.25 point)  
Problem 21.3. (page 808 in 7\textsuperscript{th} edition)  
Or  
Problem 22.3. (page 803 in 6\textsuperscript{th} edition)

Discuss the problems of deadlock and starvation, and the different approaches to dealing with these problems.

Question 3 (0.60 point)  
Problem 21.10. (page 809 in 7\textsuperscript{th} edition)  
Or  
Problem 22.11. (page 803 in 6\textsuperscript{th} edition)

• How do optimistic concurrency control techniques differ from other concurrency techniques?
• Why are they also called validation or certification techniques?
• Discuss the typical phase of an optimistic concurrency control.

**Question 4** (0.40 point)
Or

• How does the granularity of the data items affect the performance of concurrency control?
• What factors affect the selection of granularity size for data items?

**Question 5** (0.50 point)
Problem 22.1. (page 834 in 7th edition)
Or
Problem 23.1. (page 828 in 6th edition)

• Discuss the different types of transaction failures.
• What is meant by catastrophic failure.

**Question 6** (0.80 point)
Problem 22.3. (page 834 in 7th edition)
Or
Problem 23.3. (page 828 in 6th edition)

• What is the system log used for?
• What are the typical kinds of entries in a system log?
• What are checkpoints and why are they important?
• What are transactions commit points, and why are they important?

**Question 7** (0.20 point)
Problem 22.6. (page 834 in 7th edition)
Or
Problem 23.6. (page 828 in 6th edition)
What are UNDO-type and REDO-type log entries?