CSE 444 Quiz 3 and 4
Winter 2019
March 11, 2019

- Please read all instructions carefully.
- Write your name and UW student number below.
- This quiz is meant to be a combination of two smaller quizzes and not a comprehensive exam. If you seem to finish very early, that is not a bad sign.
- Please write your answers completely in the boxed space provided on the exam.
- Your answers do not need to take up all the available space, and often the best answers are concise.
- This is a closed-book quiz. No electronic devices are allowed, including cell phones used merely as watches. Silence your cell phones and place them in your bag.

By writing your name below, you certify that you have not received any unpermitted aid for this exam, and that you will not disclose the contents of the exam to anyone in the class who has not taken it.

NAME: _____

STUDENT NUMBER: _____

Lab 3: Transactions and Locking (12 points)

Assume we have the following two relations in your implementation of SimpleDB:

Relation **R** consists of 2 pages: one page completely full of tuples and one half-full page. Relation **S** is the same.

Consider two transactions that execute simultaneously:

T1 runs a query that joins **R** and **S**. (The location of output of T1 is not important.)

T2 runs a query that inserts a new tuple into **R** and then inserts a new tuple into **S**.

In the following questions you will explain how these transactions would be executed by you implementation of SimpleDB. Exactly what happens will depend on which transactions are able to acquire which locks before the other.

When you describe what happens during execution, discuss in particular all locking and unlocking operations.

a) (4 points) Is deadlock possible between these transactions? Explain why or why not, and how your system tries to avoid deadlocks.

b) (4 points) Describe how the query execution would proceed if **T1** is able to acquire all its locks on **R** and **S** before **T2** every time.

c) (4 points) Describe how the query execution would proceed if **T2** is able to acquire all its locks on **R** and **S** before **T1** every time.

Lab 4: Transaction Recovery (8 points)

a) (4 points) Is our implementation in lab 4 FORCE or NO-FORCE? Is it STEAL or NO-STEAL? For each question write both the answer and what that means in a sentence or two.

b) (4 points) In lab 4 we do not require you to implement writing CLR records during recovery. What would be the benefit of introducing CLR records?