# COP 4722 - Survey of Database Systems (U01)

## Specification2

Sep 24, 2014 COP-4722 Assignment-2 Due: Thu, Oct 2 before class begins

The purpose of this assignment is to familiarize with serializability. Show the intermediate steps for each answer.

I. Consider the three transactions $T_a$, $T_b$, and $T_c$, and the schedules $S_1$, $S_2$, $S_3$ and $S_4$ given below. Which of the schedules is (conflict) serializable? The subscript for each database operation in a schedule denotes the transaction number for that operation. For each schedule, show all conflicts, draw the precedence graph, determine and write down if it is serializable or not, and the equivalent serial schedules if exist.

$T_a$: $r_a(x)$; $w_a(x)$;
$T_b$: $r_b(x)$;
$T_c$: $r_c(x)$; $w_c(x)$;
$S_1$: $r_a(x)$; $r_c(x)$; $w_a(x)$; $r_b(x)$; $w_c(x)$;
$S_2$: $r_a(x)$; $r_c(x)$; $w_c(x)$; $w_a(x)$; $r_b(x)$;
$S_3$: $r_c(x)$; $r_b(x)$; $w_c(x)$; $r_a(x)$; $w_a(x)$;
$S_4$: $r_c(x)$; $r_b(x)$; $r_a(x)$; $w_c(x)$; $w_a(x)$;

II. Consider the three transactions $T_1$, $T_2$, and $T_3$, and the schedules $S_5$ and $S_6$ given below. Show all conflicts and draw the serializability (precedence) graphs for $S_5$ and $S_6$, and state whether each schedule is serializable or not. If a schedule is serializable, write down the equivalent serial schedule(s).
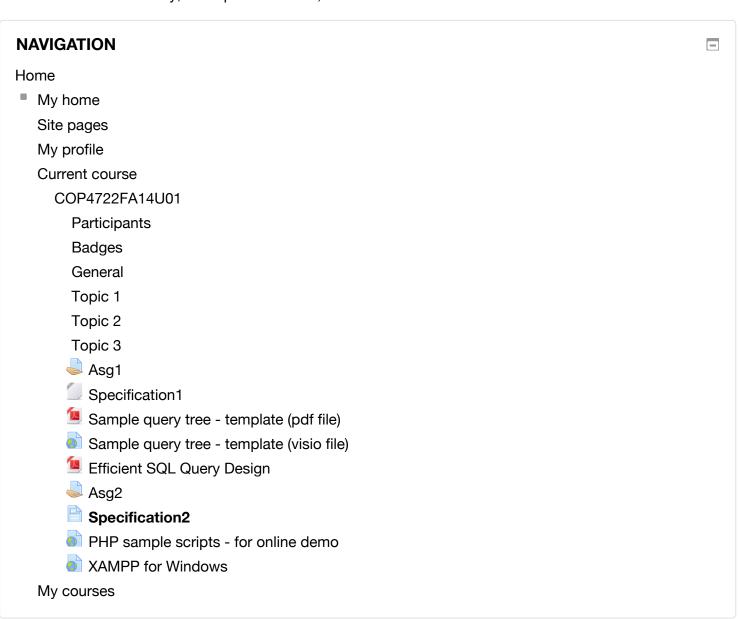
$T_1$: $r_1(p)$; $r_1(r)$; $w_1(p)$;
$T_2$: $r_2(r)$; $r_2(q)$; $w_2(r)$; $w_2(q)$;
$T_3$: $r_3(p)$; $r_3(q)$; $w_3(q)$;
$S_5$: $r_1(p)$; $r_2(r)$; $r_1(r)$; $r_3(p)$; $r_3(q)$; $w_1(p)$; $w_3(q)$; $r_2(q)$; $w_2(r)$; $w_2(q)$;
$S_6$: $r_1(p)$; $r_2(r)$; $r_3(p)$; $r_1(r)$; $r_2(q)$; $r_3(q)$; $w_1(p)$; $w_2(r)$; $w_3(q)$; $w_2(q)$;

Save all answers in a single word file and convert it into a pdf file (asg2.pdf), and upload the pdf file through Moodle (class website).

Submit a print out of this file along with the following signed declaration:

```
==========================================================
 Name: _____
 Panther-ID: x x x -_____
 Course: COP 4722
 Assignment#: 2
 Due: Thu, Oct 2, 2014

 I hereby certify that this work is my own
 and none of it is the work of any other person.


 Signature: _____
==========================================================
```

Last modified: Wednesday, 24 September 2014, 11:05 PM

## ADMINISTRATION

Course administration

My profile settings