Alexandria University
Faculty of Engineering
Comp. & Comm. Engineering
CC471: Database Systems
Spring 2021



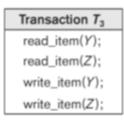
جامعة الاسكندرية كلية الهندسة برنامج هندسة الحاسب والاتصالات مادة نظم قواعد البيانات ربيع ٢٠٢١

Sheet8 Transaction Processing & Concurrency Control

- 1) Which of the following schedules is (conflict) serializable? For each serializable schedule, determine the equivalent serial schedules.
 - a) $r_1(X)$; $r_3(X)$; $w_3(X)$; $w_1(X)$; $r_2(X)$
 - b) $r_3(X)$; $r_2(X)$; $w_3(X)$; $r_1(X)$; $w_1(X)$
- 2) How many serial schedules exist for the three transactions in the Figure below? What are they? What is the total number of possible schedules?

read_item(X);
write_item(X);
read_item(Y);
write_item(Y);

read_item(Z);
read_item(Y);
write_item(Y);
read_item(X);
write_item(X);



- 3) Determine which of the following schedules are recoverable, which are cascadeless, and which are strict.
 - a) S_1 : $r_1(X)$; $w_1(X)$; $r_1(Y)$; $w_1(Y)$; C_1 ; $r_2(X)$; $w_2(X)$; C_2 ;
 - b) S_3 : $r_1(X)$; $w_1(X)$; $r_1(Y)$; $w_1(Y)$; $r_2(X)$; $w_2(X)$; c_1 ; c_2 ;
 - c) S_4 : $r_1(X)$; $w_1(X)$; $r_1(Y)$; $w_1(Y)$; $r_2(X)$; $w_2(X)$; C_2 ; C_1 ;
 - d) S_7 : $r_1(X)$; $w_1(X)$; $r_1(Y)$; $r_2(X)$; $w_1(Y)$; $w_2(X)$; C_2 ; C_1 ;
 - e) S_8 : $r_1(X)$; $w_1(X)$; $r_1(Y)$; $r_2(X)$; $w_2(X)$; $w_1(Y)$; C_1 ; C_2 ;
 - f) S_9 : $r_1(X)$; $w_1(X)$; $r_1(Y)$; $r_2(X)$; $w_2(X)$; $w_1(Y)$; C_2 ; C_1 ;
 - g) S_{21} : $r_1(X)$; $r_2(X)$; $w_1(X)$; $r_1(Y)$; $w_1(Y)$; C_1 ; $w_2(X)$; C_2 ;
 - h) S_{26} : $r_1(X)$; $r_2(X)$; $w_1(X)$; $r_1(Y)$; $w_2(X)$; C_2 ; $w_1(Y)$; C_1 ;
 - i) $S_{27}: r_1(X); r_2(X); w_1(X); w_2(X); r_1(Y); w_1(Y); C_1; C_2;$
 - j) S_{36} : $r_2(X)$; $r_1(X)$; $w_1(X)$; $r_1(Y)$; $w_1(Y)$; $r_1(Y)$; r
- 4) Prove that strict two-phase locking guarantees strict schedules.
- 5) No more questions are provided for concurrency control. It means that most exam questions on this part are review questions (اكتب مذكرات جغرافية عن علل).

How to submit the homework assignments?

- Solve the sheet individually without looking up the solution on the Internet. The sheet is to practice; it is a learning tool not an exam.
- Assignments are to be **handwritten**.
- Papers are to be scanned (I like camscanner app). Put all images in a pdf file (camscanner does that for you)