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CIS 245 ONL01

13 November 2022

Lab #8

Do the "Garden Glory Project Questions" #A to #H on pages 452-453 at the end of **Chapter 6**.

(Place your answers (no SQL this week) in a Word document and submit here for credit.)

The following Garden Glory database design is used in Chapter 3:

OWNER (OwnerlD, OwnerName, OwnerEmailAddress, OwnerType)

OWNED\_PROPERTY (PropertyID, PropertyName, Street, City, State, ZIP, OwnerID)

GG\_SERVICE (ServicelP. ServiceDescription, CostPerHour)

EMPLOYEE (EmploveeID, LastName, FirstName, CellPhone, ExperienceLevel)

PROPERTY \_SERVICE (PropertvServicelD, PropertyID, ServiceID, ServiceDate, EmployeeID, HoursWorked)

The referential integrity constraints are:

OwnerID in OWNED\_PROPERTY must exist in OwnerlD in OWNER

PropertylD in PROPERTY\_SERVICE must exist in PropertylD in OWNED\_PROPERTY

ServiceID in PROPERTY\_SERVICE must exist in ServicelD in GG\_SERVJCE

EmployeelD in PROPERTY \_SERVICE must exist in EmployeeID in EMPLOYEE

Garden Glory has modified the EMPLOYEE table by adding. a TotalHoursWorked column:

EMPLOYEE (EmployeelD, LastName, FirstName, CellPhone, ExperienceLevel, TotalHoursWorked)

The office personnel at Garden Glory use a database application to record services and related data changes in this database. For a new service, the service recording application reads a row from the OWNED\_PROPERTY table to get the PropertyID. It then creates a new row in GG\_SERVICE and updates TotalHoursWorked in EMPLOYEE by adding the HoursWorked value in the new PROPERTY \_SERVICE record to TotalHoursWorked. This operation is referred to as a Service Update Transaction.

1. Explain why it is important for the changes made by the Service Update Transaction to be atomic.

It is important for the changes made by the Service Update Transaction to be atomic because

1. Describe a scenario in which an update of TotalHoursWorked could be lost during a Service Update Transaction.
2. Assume that many Service Update Transactions and many Service Update for New Employee Transactions are processed concurrently. Describe a scenario for a nonrepeatable read and a Scenario for a phantom read.
3. Explain how locking could be used to prevent the lost update in your answer to part B.
4. Is it possible for deadlock to occur between two Service Update Transactions? Why or why not? Is it possible for deadlock to occur between a Service Update Transaction and a Service Update for New Employee Transaction? Why or why not?
5. Do you think optimistic or pessimistic locking would be better for the Service Update Transactions?
6. Suppose Garden Glory identifies three groups of users: managers, administrative personnel, and system administrators. Suppose further that the only job of administrative personnel is to make Service Update Transactions. Managers can make Service Update Transactions and Service Updates for New Employee Transactions. System administrations have unrestricted access to the tables. Describe processing rights that you think would be appropriate for this situation. Use Figure 6-19 as an example. What problems might this security system have?
7. Garden Glory has developed the following procedure for backup and recovery. The company backs up the database from the server to a second computer on its network each night. Once a month, it copies the database to a CD and stores it at a manager's house. It keeps paper records of all services provided for an entire year. If it ever loses its database, it plans to restore it from a backup and reprocess all service requests. Do you think this backup and recovery program is sufficient for Garden Glory? What problems might occur? What alternatives exist? Describe any changes you think the company should make to this system.