Readings:

* ACID Property: <https://en.wikipedia.org/wiki/ACID_(computer_science)>
* Concurrency control <https://en.wikipedia.org/wiki/Concurrency_control>
* chapter 13: “Concurrency Control” (Petkovic)

Use the sample database created in previous lecture to answer the following three questions.



1. Create a stored procedure GetEmployeeInfo which takes @dept\_no as an input parameter, and outputs a result set which includes the following fields: emp\_no, employee full name, department name. Provide a screenshot of output results using ‘d1’ as input parameter.
2. Create a stored procedure IncreaseBudgetAmount which takes @project\_no and @new\_budget as input parameters and returns @message as an output parameter. The stored procedure must perform the following business rules:
   1. If @project\_no is not found, it returns the message “Invalid Project Number”
   2. If @new\_ budget is greater than the current budget amount, it must update the project budget and return the message “budget amount increased”
   3. If @new\_ budget is less than or equal to the current budget, it does nothing and return the message “New budget must be greater than the current budget”

Provide sample execution commands for all three business cases, along with a screen shot of results for each.

1. Create a User Defined Function GetBudgetAmount which takes @project\_name and returns the budget for a given project. If it cannot find the record it returns NULL. Show a SQL example of a function being used to the budget for “CRM system”
2. What is the name of a single logical operation on the data to satisfy ACID property?
3. Which ACID property does the following DDLs satisfy?
   1. CREATE TABLE Customer (CustomerID int PRIMARY KEY, CustomerName varchar(100) NOT NULL)
4. Which ACID property ensures the integrity of data reads?
5. Failure to write data to non-volatile memory violates which property?
   1. Atomicity
   2. Consistency
   3. Isolation
   4. Durability
6. State the reasons why concurrency control needed?
7. What is the difference between a local transaction and a distributed transaction?
8. When should you use the SAVE TRANSACTION statement?
9. Discuss the difference between row-level and page-level locking.
10. Can a user explicitly influence the locking behavior of the system?