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CIS 245 ONL01

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Lab #2

This is a 2-part LAB:

PART 1: After reading the chapters and checking out the "normalization" videos, explain to me with examples what is 1st normal form, 2nd normal form and 3rd normal form (you can demonstrate it by giving me examples of what "violates" 1st normal form... if that is easier).

PART 2: Do the "Case Question" for "Regional Labs - #A - #K at end of Chapter 2 on p. 128.

Submit your answers in a Word document here on Blackboard for credit.

NOTE: No SQL programming should be done for these exercises.

Part 1:

1st normal form has two rules. These two rules are no repeating groups, and every row should be unique. Each cell should be single valued, entries in a column are same type, and rows are uniquely identified. For example, each row should have a unique id, or add more columns to make each row unique. The order of rows and columns are irrelevant in 1st normal form.

2nd normal form must be in 1st normal form. Also, there should be no partial key dependencies and all attributes must be dependent on the key. Every non-prime attribute is dependent exclusively on the primary key.

3rd normal form must be in 1st and 2nd normal form. Attributes must be dependent solely on the key and all fields(columns) can be determined only by the key in the table and no other column. Attributes are determined only by the primary key.

Part 2:

Case Question - Regional Labs

Graphical user interface, text, application

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1. Assuming that all functional dependencies are apparent in this data, which of the fol-lowing are true?

ProjectID -> EmployeeName False

ProjectID -> EmployeeSalary False

(ProjectID, EmployeeName) -> EmployeeSalary False

EmployeeName -> EmployeeSalary True  
EmployeeSalary -> ProjectID False

EmployeeSalary -> (ProjectID, EmployeeName) False

1. What is the primary key of PROJECT?

The Primary key of PROJECT is ProjectID.

1. Are all the non-key attributes (if any) dependent on the primary key?

No, the non-key EmployeeSalary is dependant on EmployeeName only.

1. In what normal form is PROJECT?

PROJECT is in 1st normal form because there are no multi valued attributes and each row is unique.

1. Describe two modification anomalies that affect PROJECT

The first anomaly would be an insertion anomaly. You are unable to add an employee name until they are part of a project, and you are also unable to add a project id until an employee has been assigned to the project. The second anomaly would be a deletion anomaly. Similar to the insertion anomaly, if you remove an employee from a project

1. Is ProjectID a determinant? If so, based on which functional dependencies in Part A?

No

1. Is EmployeeName a determinant? If so, based on which functional dependencies in Part A?

Yes, EmployeeName -> EmployeeSalary

1. Is (ProjectID, EmployeeName) a determinant? If so, based on which functional dependencies in Part A?

No, because in this case EmployeeSalary is the same for each individual employee no matter the project.

1. Is EmployeeSalary a determinant? If so, based on which functional dependencies in Part A?

No

1. Does this relation contain a transitive dependency? If so, what is it?

Yes, EmployeeName -> EmployeeSalary is a transitive dependency.

1. Redesign the relation to eliminate modification anomalies.

PROJECT (ProjectID, EmployeeName)

EMPLOYEE (EmployeeName, EmployeeSalary)

Table

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