Christopher Guay

Regional Labs Case Questions Chapter 2

IST 210

2/15/2020

|  |  |  |
| --- | --- | --- |
| ProjectID | EmployeeName | EmployeeSalary |
| 100-A | Eric Smith | 64,000.00 |
| 100-A | Donna Smith | 70,000.00 |
| 100-B | Donna Smith | 70,000.00 |
| 200-A | Eric Jones | 64,000.00 |
| 200-B | Eric Jones | 64,000.00 |
| 200-C | Eric Parks | 58,000.00 |
| 200-C | Donna Smith | 70,000.00 |
| 200-D | Eric Parks | 58,000.00 |

1. Assuming All functional dependencies are apparent in this data, which ones are true?
   1. (ProjectID, EmployeeName 🡪 EmployeeSalary
   2. EmployeeName 🡪 EmployeeSalary
2. What is the primary key of PROJECT?
   1. (ProjectID, EmployeeName) is the primary composite key defining each and every row without overlapping or redundancy
3. Are all of the nonkey attributes (if any) dependent on the primary key?
   1. No, the only other attribute (EmployeeSalary) is dependent solely on EmployeeName.
4. In what normal form (1NF, 2NF, 3NF is PROJECT?
   1. PROJECT is 1NF, meeting the requirements of a relation as well as having a primary key and no repeated groupings
5. Describe two modifications anomalies that effect PROJECT
   1. An insertion anomaly would happen if a salary for an employee were inserted, such that the project ID would have to be added as well.
   2. An update anomaly would occur if the salary of an employee were changed in one row, which would cause an inconsistency, reparable only by changing the salary in every other row for that employee’s name.
6. Is ProjectID a determinant? If so, based on which functional dependency?
   1. No, because multiple project IDs exist for the same EmployeeName and EmployeeSalary
7. Is EmployeeName a determinant? If so, based on which functional dependencies in part (A)?
   1. Yes, EmployeeName is a determinant for Employee Salary
8. Is (ProjectID, EmployeeName) a determinant? If so, based on which function dependencies in (A)?
   1. Yes, it is based on the functional dependency (ProjectID, EmployeeName) 🡪 EmployeeSalary
9. Is EmployeeSalary a determinant? If so, based on which functional dependencies in (A)?
   1. No, it is not
10. Does this relation contain a transitive dependency? If so, what is it?
    1. No, there are no transitive dependencies.
11. Redesign the relation to eliminate modification anomalies

ProjectPosition:

|  |  |
| --- | --- |
| ProjectID | EmployeeName |
| 100-A | Eric Smith |
| 100-A | Donna Smith |
| 100-B | Donna Smith |
| 200-A | Eric Jones |
| 200-B | Eric Jones |
| 200-C | Eric Parks |
| 200-C | Donna Smith |
| 200-D | Eric Parks |

ActualSalary:

|  |  |
| --- | --- |
| EmployeeName | EmployeeSalary |
| Eric Smith | 64,000.00 |
| Donna Smith | 70,000.00 |
| Eric Jones | 64,000.00 |
| Eric Parks | 58,000.00 |

Splitting the relation up into two smaller relations eliminates the modifications anomalies mentioned in part (E). ProjectPosition(ProjectID, EmployeeName) eliminates the insertion anomaly where the addition of another salary requires the input of another project ID. ActualSalary(EmployeeName, EmployeeSalary) eliminates the modification anomaly of changing the salary of an employee in one row, necessitating the change of that salary in another row also dedicated to that employee.