|  |  |  |
| --- | --- | --- |
| **CIS 422 DBMS** | **Assignment 05** | **20 Points** |

1. Consider the following table.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| EmpID | Name | DeptName | Salary | CourseTitle | DateCompleted |
| 100 | Margaret | Marketing | 50,000$ | SPSS | 01/19/201X |
| 100 | Margaret | Marketing | 50,000$ | Surveys | 02/15/201X |
| 140 | Alan | Accounting | 70,000$ | Tax Acc | 5/12/201X |
| 110 | Chris | Info Systems | 80,000$ | Python | 03/12/201X |
| 110 | Chris | Info Systems | 80,000$ | Java | 05/22/201X |
| 190 | Lorenzo | Finance | 60,000$ | Economics | 06/10/201X |
| 150 | Susan | Marketing | 46,000$ | SPSS | 01/19/201X |
| 150 | Susan | Marketing | 46,000$ | R | 09/09/201X |

1. Is this a relation? And Why?

Yes, because there are sets of attributes with corresponding values and every row has a unique combo for those attributes and values.

1. What’s the primary key?

PK: {EmpID, CourseTitle}

1. The table is susceptible to update anomalies. Provide examples of insertion, deletion, and modification anomalies.

Insertion example:

When employees are first created they won’t have any lessons completed and would mean that two of the columns would be blank which is “illegal”

Deletion example:

If a record of the table is deleted because of an intentional deletion after someone completes or withdraws from a lesson, the whole record for that employee could be lost like their name department even if they are still a worker in the system.

Modification example:

If an employee changes departments the DeptName could lead to inconsistencies

1. Draw a relational schema for the table and show the functional dependencies.

employee\_courses(EmpID,Name,DeptName,Salary,CourseTitle,DateCompleted)

DeptName -> Salary

EmpID 🡪Name, Salary, DeptName

EmpID,CourseTitle -> DateCompleted

1. Consider the following table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| OID | O\_Date | CID | C\_Name | C\_State | PID | P\_Desc | P\_Price | Qty |
| 1006 | 10/24/09 | 2 | Apex | NC | 7, 5, 4 | Table,  Desk,  Chair | 800,  325,  200 | 1, 1, 5 |
| 1007 | 10/25/09 | 6 | Acme | GA | 11, 4 | Dresser,  Chair | 500,  200 | 4,6 |

Where OID = Order ID, O\_Date= Order Date, CID = Customer ID, C\_Name = Customer Name, C\_State = Customer’s State, PID = project id, P\_Desc =Project Name, P\_Price = Product Price, Qty = Quantity Purchased

Note: 7, 5, 4 means three Product IDs. Similarly, 1, 1, 5 means three Quantities.

Functional Dependencies are:

OID 🡪 O\_Date CID 🡪 C\_Name PID 🡪 P\_Desc

PID 🡪 P\_Price OID 🡪 CID CID 🡪 C\_State

PID, OID 🡪 Qty

1. Put the above table in 1NF

A piece of paper with writing on it

Description automatically generated with medium confidence

1. Put the above table resulted from the previous step into 2NF tables

Diagram

Description automatically generated with low confidence

1. Put the above tables resulted in the previous step in 3NF Tables

Isn’t it already in 3NF?

1. Consider the following table (**Client\_Interview)**.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ClientNo** | **InterviewDate** | **InterviewTime** | **StaffNo** | **RoomNo** |
| CR76 | 13-May-02 | 10.30 | SG5 | G101 |
| CR56 | 13-May-02 | 12.00 | SG5 | G101 |
| CR74 | 13-May-02 | 12.00 | SG37 | G102 |
| CR56 | 1-July-02 | 10.30 | SG5 | G102 |

1. **Determine all the functional dependencies in the table above:**

ClientNo 🡪 InterviewDate, InterviewTime, StaffNo,RoomNo

InterviewDate,InterviewTime 🡪 StaffNo, RoomNo

1. Put the table above in BCNF tables

This would require two tables

TABLE ONE:

client\_interview (ClientNo,InterviewDate,InterviewTime, RoomNo)

TABLE TWO:

interview\_staff (InterviewDate,InterviewTime,StaffNo

Now there are no determinants as candidate key.