**Problem Description:**

Consider the following relation about cricket players during a season. The following table tracks the number of runs scored by the player. An instance of the table as it stands is given. Assume:

1. No two players have the same name.
2. A player can play against another team more than once but not on the same date. Further, a player plays only one game on any date
3. A coach coaches only one team.
4. Two teams can have a game against different opponents on the same date.
5. Every player is given a number and no two players on the same team can have the same number. Two players on different teams can have the same number.

**Player (PlayerName, PlayerState, PlayerNumber, PlayerTeam, TeamCoach, GameAgainst, GameDate, PlayerRuns)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sachin Tendulkar | Maharashtra | 11 | India | Greg Chappel | Pakistan  Pakistan  England | 12/3/03  25/3/03  29/3/03 | 95  22  88 |
| Adam Gilchrist | Western Australia | 34 | Australia | John Buchanan | S. Africa  S. Africa  New Zealand | 10/3/03  11/3/03  12/3/03 | 42  61  62 |

For the following questions, explain your steps clearly.

1. Is the relation in 1NF? Why or why not? If not, reduce the relation to 1NF.
2. Using your knowledge of cricket and from the instance, identify the functional dependencies for this relation.
3. Is the table you created in question 1 also in 2NF? If not decompose the relation into ones that are in 2NF.
4. Is/Are the table(s) you created in question 3 also in 3NF? If not decompose into 3NF.

ER Diagram

**Part 1**

Draw an ER Diagram for a company database with the following specifications.

1. A company is identified by its name (which is unique), address, and the name of the CEO who is an employee.
2. A Company employs many employees. Employees are identified by an ID (unique), name, rank and age. Employees are either part-time or full-time. Full-time employees are eligible for a number of vacation days and a monthly salary. Part-time employees work a certain number of hours a week and earn pay based on an hourly rate – you must keep track of the number of hours worked.
3. A Company can have several divisions. Divisions are identified by a name and a division manager, who is also an employee. A division can be a manufacturing plant or a management facility. The manufacturing plant produces a certain number of parts per day and has a safety officer who is also an employee.
4. Divisions make products. A product is identified by a Product ID (unique), a product classification, and a product name. Many divisions can make the same product.
5. Employees are assigned to divisions. You will need to store the date on which an employee was assigned to a division. An employee can be assigned to only one division at a time.

Reduce the above statements to ER diagram

Creation of Table with constraints

1. Create a table Product as per the following specifications.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Attribute** | **Data Type** | **Size** | **Allow Null** | **Condition** |
| ProductID | Auto Increment |  | No | Primary Key |
| Description | String | 30 | No | UNIQUE , |
| SetQty | Integer |  | No | Either 1, 5 or 10  Default value 1 |
| Rate | e.g. 100.25 | Precision 10 and scale 2 | Yes | Range :  51 – 5000 |

1. Insert 20 records in the above Product table
2. Update all the rates with 10% rate hike.
3. Delete last record by providing the ProductID.
4. Alter the above table and add the following column.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Attribute** | **Data Type** | **Size** | **Allow Null** | **Condition** |
| MarginCode | Char | 1 | Yes | A or B or Null |

1. Update few records to set MarginCode to A and some records MarginCode to B
2. Update all the SetQty to 10 for all Items which have MarginCode A and whose original SetQty is 1.