**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.

No,Because it is having Multivalued data.

1NF: Dividing the tables into sub tables based on repeated groups of data.

Table 1:PlayerDatails

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PlayerName** | **PlayerState** | **PlayerNumber** | **PlayerTeam** | **TeamCoach** |
| Sachin Tendulkar | Maharashtra | 11 | India | Greg Chappel |
| Adam Gilchrist | Western Australia | 34 | Australia | John Buchanan |

Table 2:MatchDatails

|  |  |  |
| --- | --- | --- |
| **GameAgainst** | **GameDate** | **PlayerRuns** |
| Pakistan | 12/3/03 | 95 |
| Pakistan | 25/3/03 | 22 |
| England | 29/3/03 | 88 |
| S. Africa | 10/3/03 | 42 |
| S. Africa | 11/3/03 | 61 |
| New Zealand | 12/3/03 | 62 |

1. Using your knowledge of cricket and from the instance, identify the functional dependencies for this relation.

PlayerName ----🡪PlayerState

PlayerName---🡪PlayerNumber

PlayerTeam---🡪Team Coach

1. Is the table you created in question 1 also in 2NF? If not decompose the relation into ones that are in 2NF.

No,Because it doen’t have Primary key Column for Player Name because it is Unique.

2NF:Defining Primary Key for eliminating the Duplicates and divide max sub tables.

Player Details:

|  |  |  |
| --- | --- | --- |
| **PlayerName(PK)** | **PlayerState** | **PlayerNumber** |
| Sachin Tendulkar | Maharashtra | 11 |
| Adam Gilchrist | Western Australia | 34 |

TeamInfo:

|  |  |
| --- | --- |
| **PlayerTeam(PK)** | **TeamCoach** |
| India | Greg Chappel |
| Australia | John Buchanan |

MatchDatails

|  |  |  |
| --- | --- | --- |
| **GameAgainst** | **GameDate** | **PlayerRuns** |
| Pakistan | 12/3/03 | 95 |
| Pakistan | 25/3/03 | 22 |
| England | 29/3/03 | 88 |
| S. Africa | 10/3/03 | 42 |
| S. Africa | 11/3/03 | 61 |
| New Zealand | 12/3/03 | 62 |

1. Is/Are the table(s) you created in question 3 also in 3NF? If not decompose into 3NF.

No,Because Two tables have no relation

3NF:Implementing the relationship between two tables by using FK.

PlayerDatails

|  |  |  |  |
| --- | --- | --- | --- |
| **PlayerName(PK)** | **PlayerState** | **PlayerNumber** | **PlayerTeam(FK)** |
| Sachin Tendulkar | Maharashtra | 11 | India |
| Adam Gilchrist | Western Australia | 34 | Australia |

TeamInfo

|  |  |
| --- | --- |
| **PlayerTeam(PK)** | **TeamCoach** |
| India | Greg Chappel |
| Australia | John Buchanan |

Match deails

|  |  |  |  |
| --- | --- | --- | --- |
| **PlayerName(FK)** | **GameAgainst** | **GameDate** | **PlayerRuns** |
| Sachin Tendulkar | Pakistan | 12/3/03 | 95 |
| Sachin Tendulkar | Pakistan | 25/3/03 | 22 |
| Sachin Tendulkar | England | 29/3/03 | 88 |
| Adam Gilchrist | S. Africa | 10/3/03 | 42 |
| Adam Gilchrist | S. Africa | 11/3/03 | 61 |
| Adam Gilchrist | New Zealand | 12/3/03 | 62 |

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

Products

mks

Safty Offcr

Manufacturing pla

opts

Divisions

Assigns

Has

Div mngr

Tm

Employes

has

Compny

CEO

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 |

--Table Creation

create table Product(

Productid int not null primary key identity(1,1),

Description varchar(30) not null unique,

setqty int not null check (setqty=1 or setqty=5 or setqty=10) default 1,

rate decimal(10,2)

check (rate >=51 and rate<=5000))

1. Insert 20 records in the above Product table

insert into product values('refrigirator',5,1675)

insert into product values('electric fan',10,2000)

insert into product values('Car',1,3000)

insert into product values('washing machine',1,2789)

insert into product values('Heater',5,2000)

insert into product values('television',10,1000.67)

insert into product values('cooler',10,2000.67)

insert into product values('water heater',5,2000)

insert into product values('vaccum cleaner',1,3000)

insert into product values('mixer',10,2000)

insert into product values('laptop',1,3000)

insert into product values('blender',5,2000)

insert into product values('Cycle',5,2000)

insert into product values('Mobile',1,1000)

insert into product values('lamp',5,1000)

insert into product values('coffe maker',5,2000)

insert into product values('Watch',10,3000)

insert into product values('water puirifier',1,2000)

insert into product values('Pepe Jeans',10,3000)

insert into product values('sperkers',1,3000)

3.Update all the rates with 10% rate hike.

update product set rate=rate\*0.1 from product

4.Delete last record by providing the ProductID.

delete from product where productid=20

5.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 |

alter table Product add MarginCode char(1)

CHECK (MarginCode='A' OR MarginCode='B' default null)

6.Update few records to set MarginCode to A and some records MarginCode to B

update product

set MarginCode='A'

where productid<7

update product

set MarginCode='B'

where productid>11

7.Update all the SetQty to 10 for all Items which have MarginCode A and whose original SetQty is 1.

update product set setqty=10 where MarginCode='A' and SetQty=1