9/8/2022

**Normalization**

* A set of rules applied to the attributes to create a Relational Database Design
* Each Rule is called a Normal Form
* We don’t Normalize to the entire application at once
  + We do one view at a time

Example: Employee Workload

The employee workload is a display, which lets a manager determine the department an employee is assigned to within the company and the projects the employee is currently working on. This information helps the manager assign employees to new projects that are taken on by the company. A sample employee workload screen layout is shown below:

Employee Workload

Employee Id: 1111111 Name: John Doe

Works For Department Number: 1 Name: Information Systems

Currently Assigned to:

Project

Number Name Weekly Hours

IS-101 2000 Bug 20

PR-222 Inventory Control 5

Business rules:

1. An employee works for a single department in the company.
2. A department can have many employees working for it simultaneously.
3. An employee can be assigned to a maximum of 4 projects simultaneously.
4. A project can have many employees working on it simultaneously.
5. Employee Id, Department Number and Project Number uniquely identify employees, departments and projects respectively.

**1. Initial Table**

EmployeeID{PK}, EmployeeName, DeptNumber, DeptName, (ProjectNumber, ProjectName, WeeklyHours)

**2. 1NF – All Atomic and no repeating groups**

EmployeeID{PK}, EmployeeFirstName, EmployeeLastName, DeptNumber, DeptName

ProjectName, WeeklyHours, EmployeeID{FK}{PK} and ProjectNumber{PK} <- composite keys

**3. 2NF** – **No Partial Dependencies**

EmployeeID{PK}, EmployeeFirstName, EmployeeLastName, DeptNumber, DeptName

WeeklyHours, EmployeeID{FK}{PK} and ProjectNumber{PK}{FK} <- composite keys

ProjectName, ProjectNumber{PK}

**4. 3NF – No Transitive Dependencies**

EmployeeID{PK}, EmployeeFirstName, EmployeeLastName, DeptNumber{FK}

WeeklyHours, EmployeeID{FK}{PK} and ProjectNumber{PK}{FK} <- composite keys

ProjectName, ProjectNumber{PK}

DeptNumber{PK}, DeptName

Diagram, schematic

Description automatically generated