

Module: Information Systems, 2nd Year Bachelor's Degree in computer science

Solution for Tutorial 5

Exercise 1

For "Client," the client number "Client ID" uniquely identifies each client.

For "Company," the company name uniquely identifies each company.

For "Depot," none of the properties uniquely identifies each depot. Therefore, we need to add a "Depot ID," which will fulfill this role.

Functional Dependencies

Client ID → Name

Company Name → Activity, Capital

Depot ID → Depot Name, Address, Area

Invoice ID → Client ID, Date

Product ID → Description, Unit Sale Price

Invoice ID, Product ID → Quantity

Interpretation of Business Rules

Rule 1: There is no functional dependency between Company Name and Depot ID.

Company Name $\not\rightarrow$ Depot ID

Rule 2: There is no functional dependency between Depot ID and Product ID.

Depot ID $\not\rightarrow$ Product ID

Rule 3: There is no functional dependency between Product ID and Depot ID.

Product ID $\not\rightarrow$ Depot ID

Exercise 2

Business Rules

- A Department is managed by a Director.

- A Teacher can teach multiple Modules.
- A Teacher only teaches within their Department.
- A Module can be taught by multiple Teachers.
- Each Teacher must belong to a Team.
- A Team can handle at least one Project.

2. Data Dictionary (DD)

We will only provide the first two columns of the DD.

Symbol	Meaning
Dpt_ID	Department Number
Dpt_Name	Department Name
Teach_Num	Number of Teachers
Dir_Name	Director Name
Teach_ID	Teacher Number
Teach_LName	Teacher Last Name
Teach_FName	Teacher First Name
Teach_Rank	Teacher Rank
Mod_Cod	Module Code
Mod_Des	Module Description
Team_ID	Team Number
Team_Theme	Team Theme
Prj_ID	Project Number
Prj_Des	Project Description

3. Functional Dependency Graph (FDG)

Rule 1: Dpt_Num \rightarrow Dir_Name

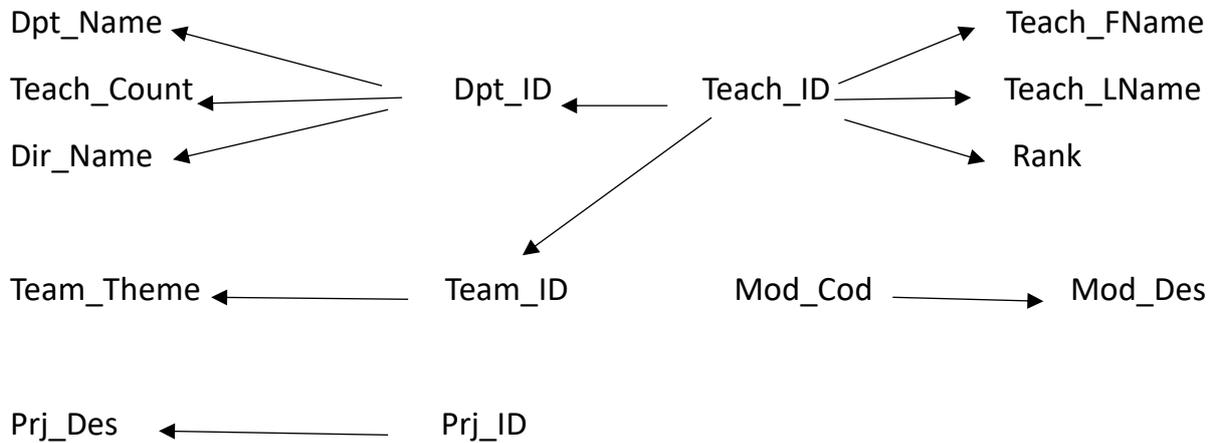
Rule 2: Teach_ID $\times\rightarrow$ Mod_Cod

Rule 3: Teach_ID \rightarrow Dpt_ID

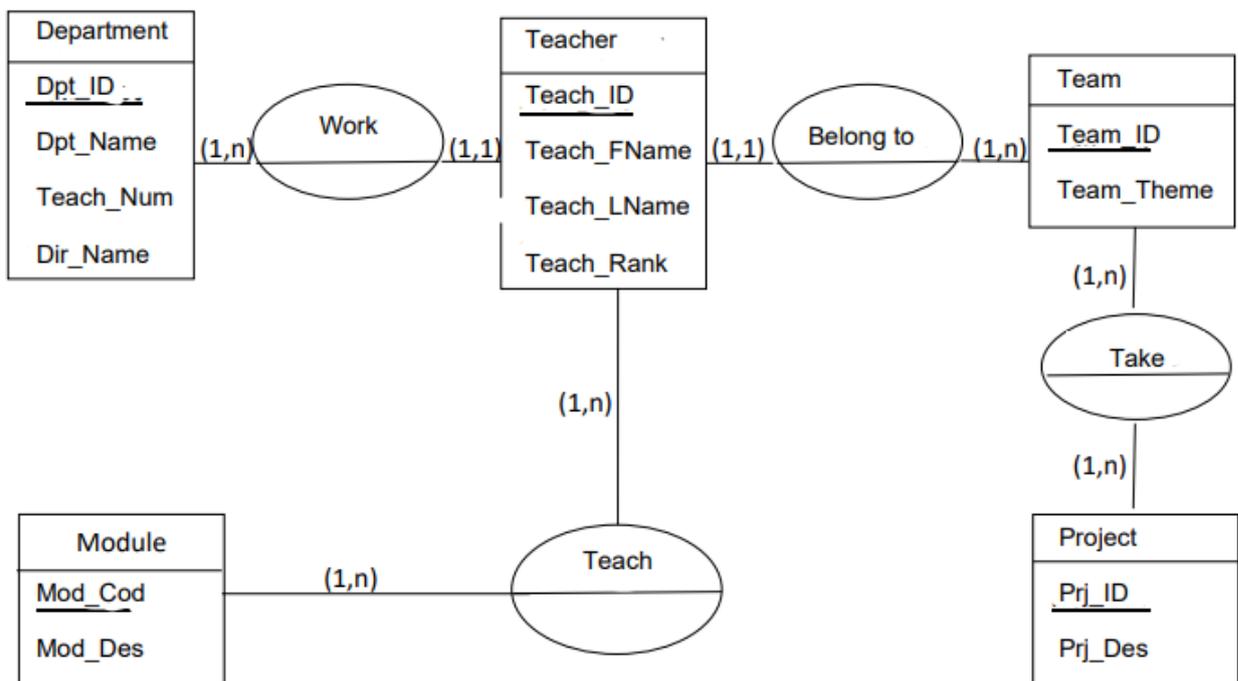
Rule 4: Mod_Cod $\times\rightarrow$ Teach_ID

Rule 5: Teach_ID → Team_ID

Rule 6: Team_ID ↛ Prj_ID



4. Conceptual Data Model (CDM)



Note: It is assumed that a project can be handled by one or more teams.

Exercise 3

1. Business Rules

- A product can be in stock in several stores.
- An order is placed with suppliers.

- A product is sold by several suppliers.

2. Data Dictionary (DD)

Only the first two columns of the DD will be used:

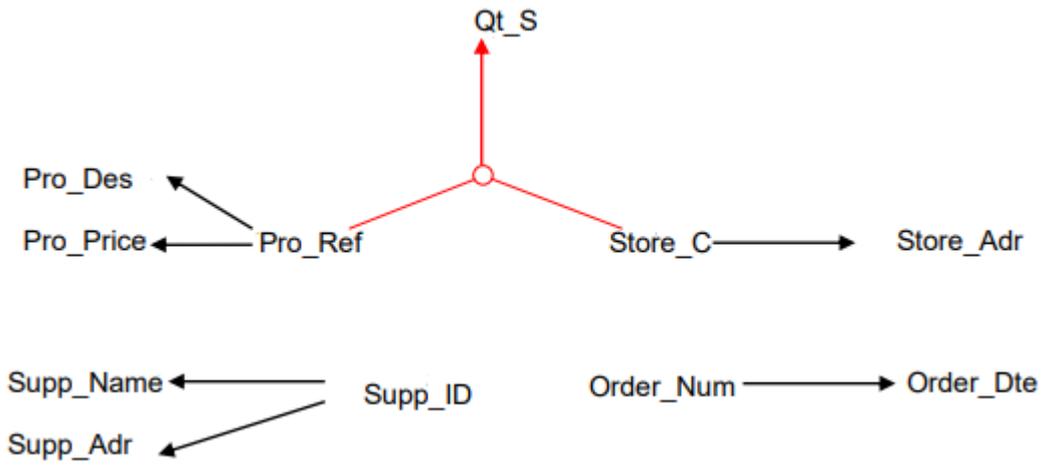
Symbols	Meaning
Pro_Ref	Product Reference
Pro_Des	Product Description
Pro_Price	Product Unit Price
Qt_S	Quantity in Stock
Store_C	Internal Store Code
Store_Adr	Store Address
Order_Num	Order Number
Order_Dte	Order Date
Supp_ID	Supplier Number
Supp_Name	Supplier Name
Supp_Adr	Supplier Address

3. Functional Dependency Graph (FDG)

Rule 1: Pr_Ref \twoheadrightarrow Store_C

Rule 2: Order_Num \twoheadrightarrow Supp_ID

Rule 3: Pr_Ref \twoheadrightarrow Supp_ID



4. Conceptual Data Model (CDM)

