1) Your task in this exercise is to move the un-normalized table to 3NF. To do this, use the dependency diagram.

Unnormalized Table

Dept #	Dept Name	Location	Mgr Name	Mgr ID No.	Tel Extn.	Cust #	Cust Name	Date of Complaint	Nature of Complaint
11232	Soap Division	Cincinnati	Mary Samuel	S11	7711	P10451	Robert Drumtree	12/01/1998	Poor Service
						P10480	Steven Parks	14/01/1998	Discourteous Attendant

1 NF :- \\

1) Dept

(**Dept#** , Dept-Name , Location , Mgr-Name , Mgr-ID , Telephone)

2) Customer

(**Dept #** , **Cust #** , Cust-Name , Date of Complaint , Nature of Complaint)

2 NF :- \\

1) Dept

(**Dept#** , Dept-Name , Location , Mgr-Name , Mgr-ID , Telephone)

2) Customer Complaint

(**Dept #** , **Cust #** , Date of Complaint , Nature of Complaint)

3) Customer

(**Cust #** , Cust-Name)

3 NF :- \\

1) Dept

(**Dept#** , Dept-Name , Location , Mgr-ID , Telephone)

2) Managers

(**Mngr-ID** , Mngr-Name)

2) Customer Complaint

(**Dept #** , **Cust #** , Date of Complaint , Nature of Complaint)

3) Customer

(**Cust #** , Cust-Name)

The table below depicts the requirements for a business consultancy working on local and international projects.

Emp-No	Emp-Name	Dept	Dept Manager	Proj-id	Proj-Start-Date	Location	Weeks-on-Project
005	Smith	Marketing	Jones	A B C	12-1993 06-1994 09-1994	Poole Plymouth Portsmouth	11 15 6
007	Bond	Accounts	Bloggs	B D	06-1994 06-1994	Plymouth Berlin	3 9
009	King	Info Systems	Hurne	C	09-1994	Portsmouth	10
010	Holt	Accounts	Bloggs	A B D	12-1993 06-1994 06-1994	Poole Belfast Hamburg	21 10 12

Emp.no is the primary key. Employees work on a number of projects concurrently. *Weeks-on-project* represents the number of weeks that an employee has spent on a particular. The employee number, *emp-no*, and the project identifier, *project-id*, are unique identifiers. The department manager, *manager*, is the name of the current manager, i.e., there can be only one manager per department. A project can take place in several locations (i.e Employees can work on a project from their location). You are required to show the first, second and third normal forms.

1 NF :- \\

1) Employee
        (Emp-No , Emp-Name , Department , Dpt Mngr)

2) Projects
        (Emp-No , Project-ID , Project-StartDate , Location , Weeks On Project)

2 NF :- \\

1) Employee
        (Emp-No , Emp-Name , Department , Dpt Mngr)

2) Emp of Projects
        (Emp-No , Project-ID , Location , Weeks On Project)

3) Project Start
        (Project-ID , Project-StartDate)

3 NF :- \\

1) Employee
        (Emp-No , Emp-Name , Department)

2) Manager
        (Department , Dpt Mngr)

3) Emp of Projects
        (Emp-No , Project-ID , Location , Weeks On Project)

4) Project Start
        (Project-ID , Project-StartDate)

3- Normalization:

The following table represents the database of a system that stores data about all Car Companies in Egypt. **Model ID is the identifier for each model <u>with a specific color</u>**. *Selling Price* is the price of that model in the specified Company. *Available Quantity* is the quantity of the model in this Company. *Dealer* is the distributer (موزع) of the specified model regardless of the Company. **Company *ID* is the current Primary Key** of the table.

You are required to show the first, second and third normal forms.

Company ID	Company Name	Company Address	Model ID	Model Name	Model Colour	Selling Price	Available Quantity	Dealer	Dealer Address
111	X	Haram,Giza	10	Accent	Silver	85000	3	Hyundai	Doki,Giza
			11	Accent	Black	88000	5	Hyundai	Doki,Giza
			20	Corolla	Black	134000	10	Toyota	Tahrir,Cairo
			30	Yaris	Grey	98000	8	Toyota	Tahrir,Cairo
222	Y	Heliopolis,Cairo	10	Accent	Silver	82000	11	Hyundai	Doki,Giza
			31	Yaris	Silver	97000	5	Toyota	Tahrir,Cairo
333	Z	Doki,Giza	20	Corolla	Black	133000	6	Toyota	Tahrir,Cairo
			21	Corolla	Silver	129000	5	Toyota	Tahrir,Cairo
			40	Cerato	Red	95000	4	Kia	Zamalek,Giza
			41	Cerato	Grey	95000	8	Kia	Zamalek,Giza
			50	Picanto	Light Blue	65000	10	Kia	Zamalek,Giza

1 NF :- \\

1) Company
   (<u>Company-ID</u>, Company-Name , Address)

2) Company Models
   (<u>Company-ID, Model-ID</u> , Model-Name , Color , Selling Price , Quantity , Dealer , Dealer Address)

2 NF :- \\

1) Company
   (<u>Company-ID</u> , Company-Name , Address)

2) Company Models
   (<u>Company-ID, Model-ID</u> , Selling Price , Quantity)

3) Models
   (<u>Model-ID</u> , Model-Name , Color , Dealer , Dealer Address)

3 NF :- \\

1) Company
   (<u>Company-ID</u> , Company-Name , Address)

2) Company Models
   (<u>Company-ID, Model-ID</u> , Selling Price , Quantity)

3) Models
   (<u>Model-ID</u> , Color , Model-Name , Dealer)

4) Dealer
   (<u>Dealer</u>, Dealer Address)