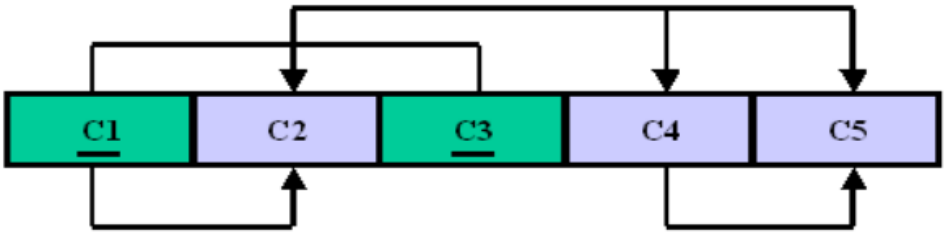
1. Express the following real world facts using functional dependencies:
   (a) A lecturer, identified by the value of the attribute LecturerId, has a name (Name), an office (Office), and a phone extension number (ExtensionNo).
   (b) The number of students (NoOfStud) enrolled in a course, which is identified by the value of the attribute CourseId, depends on the term when the course is offered (Term) and the year (Year).
   (c) Each office (Office) has only one phone extension number (ExtensionNo) and each phone extension number belongs to at most one office.

2. Given the dependency diagram shown in the following Figure, Identify and discuss each of the indicated dependencies.



3 Examine the table shown below.

branchNo	*branchAddress*	*telNos*
B001	8 Jefferson Way, Portland, OR 97201	503-555-3618, 503-555-2727, 503-555-6534
B002	City Center Plaza, Seattle, WA 98122	206-555-6756, 206-555-8836
B003	14 – 8th Avenue, New York, NY 10012	212-371-3000
B004	16 – 14th Avenue, Seattle, WA 98128	206-555-3131, 206-555-4112

(a) Why is this table not in 1NF?
(b) Describe and illustrate the process of normalizing the data shown in this table to third normal form (3NF).
(c) Identify the primary, alternate and foreign keys in your 3NF relations.

4. Examine the table shown below.

staffNo	*branchNo*	*branchAddress*	*name*	*position*	*hoursPerWeek*
S4555	B002	City Center Plaza, Seattle, WA 98122	Ellen Layman	Assistant	16
S4555	B004	16 – 14th Avenue, Seattle, WA 98128	Ellen Layman	Assistant	9
S4612	B002	City Center Plaza, Seattle, WA 98122	Dave Sinclair	Assistant	14
S4612	B004	16 – 14th Avenue, Seattle, WA 98128	Dave Sinclair	Assistant	10

(a) Why is this table not in 2NF?
(b) Describe and illustrate the process of normalizing the data shown in this table to third normal form (3NF).
(c) Identify the primary, (alternate) and foreign keys in your 3NF relations.

5. Examine the table shown below.

branchNo	*branchAddress*	*telNo*	*mgrStaffNo*	*name*
B001	8 Jefferson Way, Portland, OR 97201	503-555-3618	S1500	Tom Daniels
B002	City Center Plaza, Seattle, WA 98122	206-555-6756	S0010	Mary Martinez
B003	14 – 8th Avenue, New York, NY 10012	212-371-3000	S0145	Art Peters
B004	16 – 14th Avenue, Seattle, WA 98128	206-555-3131	S2250	Sally Stern

(a) Why is this table not in 3NF?
(b) Describe and illustrate the process of normalizing the data shown in this table to third normal form (3NF).
(c) Identify the primary, (alternate) and foreign keys in your 3NF relations.

6. Given the following Figure, Identify and discuss each dependencies.

StdSSN	**StdCity**	**StdClass**	**OfferNo**	**OffTerm**	**OffYear**	**EnrGrade**	**CourseNo**	**CrsDesc**
S1	SEATTLE	JUN	O1	FALL	2006	3.5	C1	DB
S1	SEATTLE	JUN	O2	FALL	2006	3.3	C2	VB
S2	BOTHELL	JUN	O3	SPRING	2007	3.1	C3	OO
S2	BOTHELL	JUN	O2	FALL	2006	3.4	C2	VB

1. Identify Anomalies from the relation above
2. Identify all dependencies
3. Normalize the relation up to the 3rd normal form

7.

OrderID	Order Date	Customer ID	Customer Name	Customer Address	ProductID	Product Description	Product Finish	Product StandardPrice	Ordered Quantity
1006	10/24/2010	2	Value Furniture	Plano, TX	7	Dining Table	Natural Ash	800.00	2
1006	10/24/2010	2	Value Furniture	Plano, TX	5	Writer's Desk	Cherry	325.00	2
1006	10/24/2010	2	Value Furniture	Plano, TX	4	Entertainment Center	Natural Maple	650.00	1
1007	10/25/2010	6	Furniture Gallery	Boulder, CO	11	4–Dr Dresser	Oak	500.00	4
1007	10/25/2010	6	Furniture Gallery	Boulder, CO	4	Entertainment Center	Natural Maple	650.00	3

4. Identify Anomalies from the relation above
5. Identify all dependencies
6. Normalize the relation up to the 3rd normal form