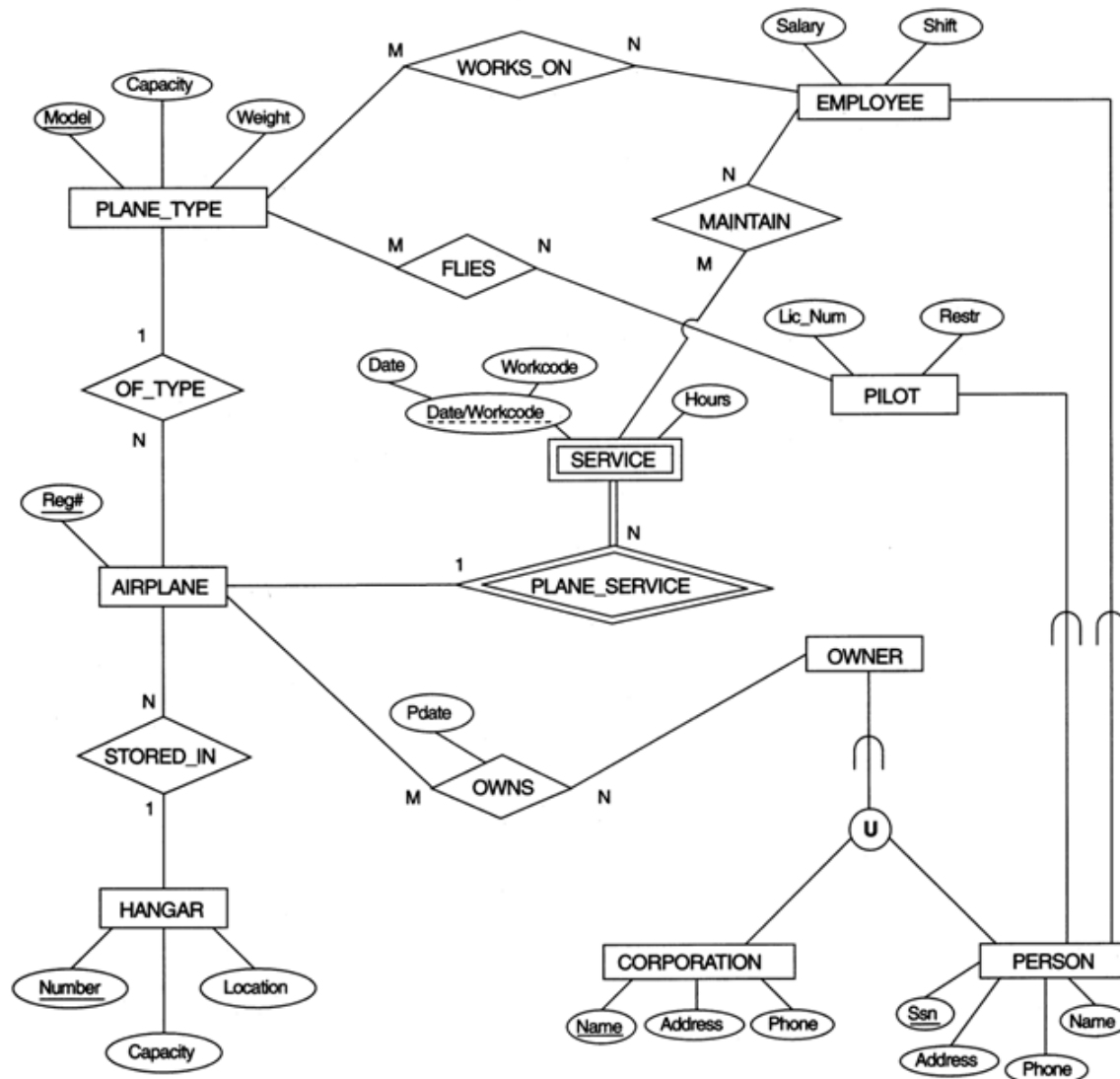


**Assignment-4**

1. **Design** a relational database for the following Airport E-R diagram and **write** an SQL script (airport.sql) with all constraints similar to companyscript.sql. [25]



2. Consider the universal table  $T = \{A, B, C, D, E, F, G, H, I, J\}$  with the following set of functional dependencies:

$\{A, B\} \rightarrow \{C\}$   
 $\{B, D\} \rightarrow \{E, F\}$   
 $\{A, D\} \rightarrow \{G, H\}$   
 $\{A\} \rightarrow \{I\}$   
 $\{H\} \rightarrow \{J\}$

What is the primary key for T? [5]

Decompose T into 2NF tables. [10]

Decompose T into 3NF tables. [10]

3. Consider the following table:

CAR\_SALE(Car#, DateSold, Salesperson#, CommissionPercent, DiscountAmt)

Assume that a car may be sold by multiple salespersons,  
and hence  $\{Car\#, Salesperson\# \}$  is the primary key.

Additional functional dependencies are

$\{DateSold\} \rightarrow \{DiscountAmt\}$   
 $\{Salesperson\# \} \rightarrow \{CommissionPercent\}$

a) Based on the primary key, is this table in 1NF, 2NF, or 3NF? Why? [10]

b) How would you successively normalize it completely? [15]

4. Consider the following table for published books:

BOOK(BookTitle, AuthorName, BookType, ListPrice, AuthorAffil, Publisher)

AuthorAffil refers to the affiliation of author. Suppose the following functional dependencies exist:

$\{BookTitle\} \rightarrow \{Publisher, BookType\}$   
 $\{BookType\} \rightarrow \{ListPrice\}$   
 $\{AuthorName\} \rightarrow \{AuthorAffil\}$

a) What normal form is the table in? Explain your answer. [10]

b) Apply normalization until you cannot decompose the tables further. State the reasons behind each decomposition. [15]

Submission:

1. Store the answer for all questions in a file asg4.doc  
Convert the Word file into a pdf file  
(see <http://www.cutepdf.com/products/cutepdf/writer.asp> )  
and upload the pdf file through the course website.
2. Submit a print out of the pdf file  
along with the following originality declaration and signature.

=====

Name: \_\_\_\_\_

Panther-ID: x x x -\_\_\_\_\_ (Last 4 digits)

Course: COP 4710

Assignment#: 4









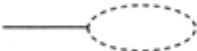


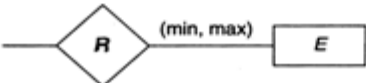
Due: Wed, Jun 11, 2014

I hereby certify that this work is my own and none of  
it is the work of any other person.

Signature: \_\_\_\_\_

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## Notation for the ER diagram

Symbol	Meaning
	ENTITY
	WEAK ENTITY
	RELATIONSHIP
	IDENTIFYING RELATIONSHIP
	ATTRIBUTE
	KEY ATTRIBUTE
	MULTIVALUED ATTRIBUTE
	COMPOSITE ATTRIBUTE
	DERIVED ATTRIBUTE
	TOTAL PARTICIPATION OF $E_2$ IN $R$
	CARDINALITY RATIO 1: $N$ FOR $E_1:E_2$ IN $R$
	STRUCTURAL CONSTRAINT (min, max) ON PARTICIPATION OF $E$ IN $R$