

CIS6300: HW Assignment 1  
Modeling Databases using E/R Diagrams  
Due: 09/08/2019 [6:30 PM]

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Please go over the Sample ‘**Dinner Program for Members of a Club**’ Entities, ERD and Dependency diagrams provided in **Part A**. Part A is an example for your practice only. Once you are comfortable with the example, please complete requirements for the case listed in the **Part B: Case & Requirements** section. *Part B is what you will work on and turn in.*

## Part A: **Sample**

### **Dinner Program for Members of a Club [Entities and Attributes]**

**Entity:** MEMBER

**Attributes:** MEM\_NUM, MEM\_NAME, MEM\_ADDRESS, MEM\_CITY, MEM\_STATE, MEM\_ZIP

**Primary Key:** MEM\_NUM

**Foreign Key:** None

**Entity:** INVITATION

**Attributes:** INVITE\_NUM, INVITE\_DATE, DIN\_CODE, MEM\_NUM, INVITE\_ACCEPT, INVITE\_ATTEND

**Primary Key:** INVITE\_NUM

**Foreign Keys:** DIN\_CODE, MEM\_NUM

**Entity:** DINNER

**Attributes:** DIN\_CODE, DIN\_DATE, DIN\_DESCRIPTION, ENT\_CODE, DES\_CODE

**Primary Key:** DIN\_CODE

**Foreign Keys:** ENT\_CODE, DES\_CODE

**Entity:** ENTREE

**Attributes:** ENT\_CODE, ENT\_DESCRIPTION

**Primary Key:** ENT\_CODE

**Foreign Key:** None

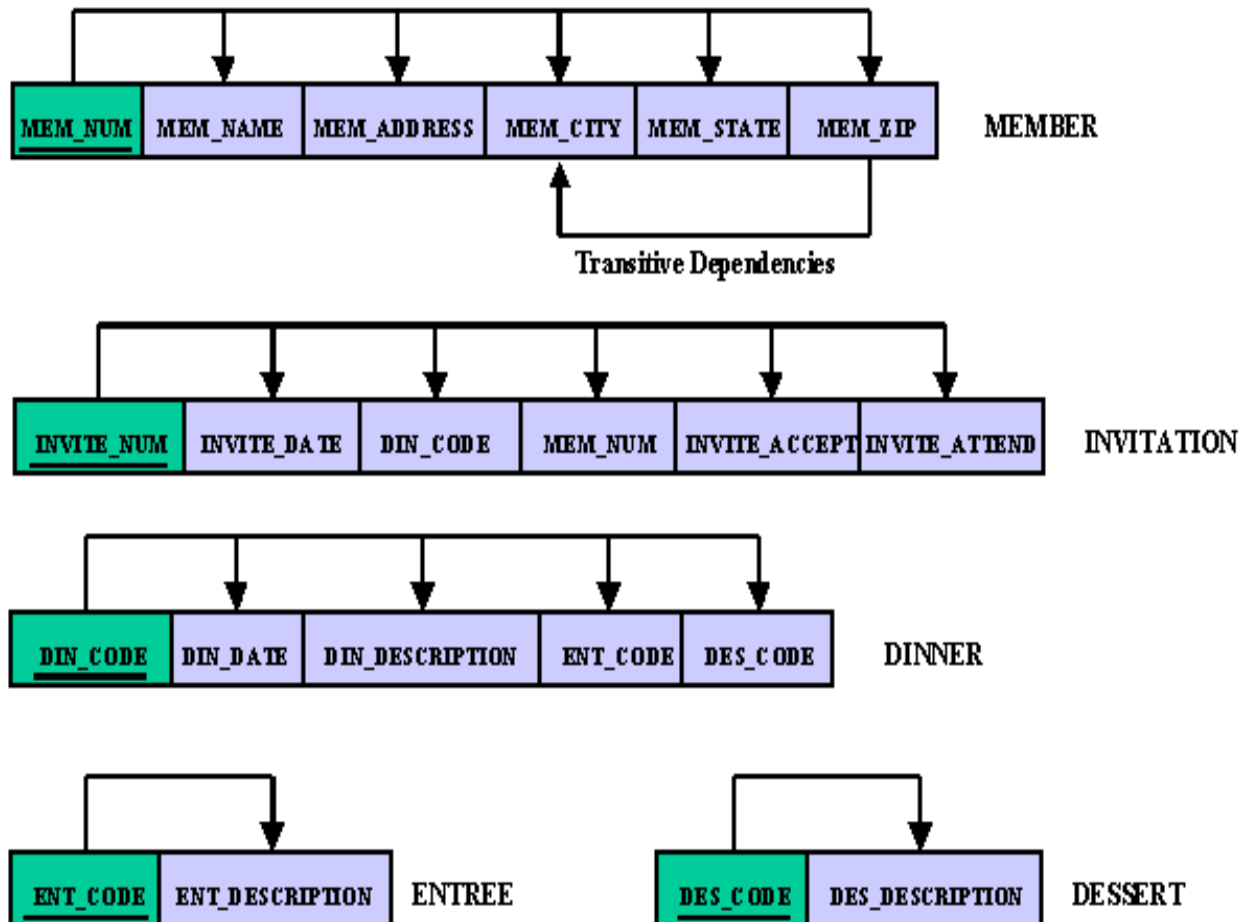
**Entity:** DESSERT

**Attributes:** DES\_CODE, DES\_DESCRIPTION

**Primary Key:** DES\_CODE

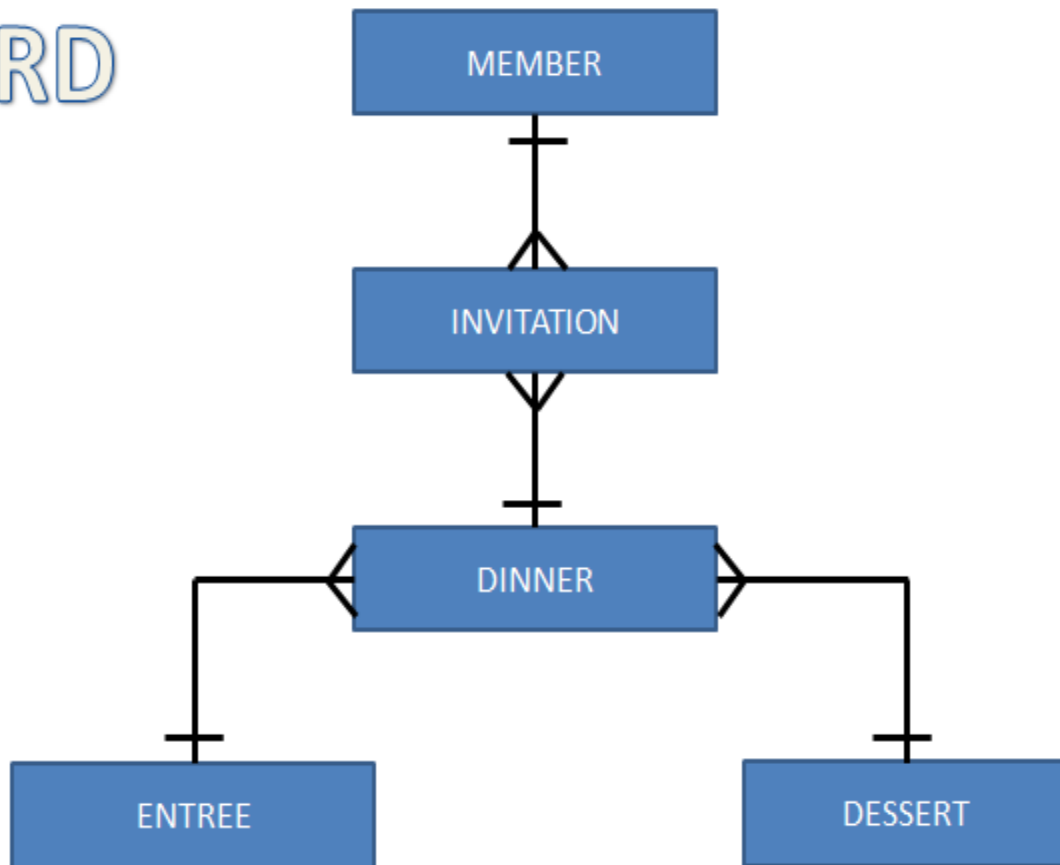
**Foreign Key:** None

## Sample Dependency Diagrams



## Sample ERD

ERD



Please note that Many cardinality in this example could be One-to-Many or optional many depending on the situation.

## Sample Data Dictionary Entries for Two Entities

### Entity: MEMBER

ATTRIBUTE	DESCRIPTION	DATA TYPE	DATA FORMAT	SAMPLE VALUE	PRIMARY KEY?	FOREIGN KEY?	DERIVED ATTRIBUTE?
MEM_NUM	Member Number	Numeric	Autonumber	10010	Yes	No	No
MEM_NAME	Member Name	Character	Text	John Doe	No	No	No
MEM_ADDRESS	Member Address	Character	Text	123 Nowhere Ave,	No	No	No
MEM_CITY	Member City	Character	Text	Kalamazoo	No	No	No
MEM_STATE	Member State	Character	Text	Michigan	No	No	No
MEM_ZIP	Member Zip Code	Numeric	Integer	44999	No	No	No

### Entity: INVITATION

ATTRIBUTE	DESCRIPTION	DATA TYPE	DATA FORMAT	SAMPLE VALUE	PRIMARY KEY?	FOREIGN KEY?	DERIVED ATTRIBUTE?
INVITE_NUM	Invitation Number	Numeric	Autonumber	20112390	Yes	No	No
INVITE_DATE	Invitation Date	Date	mm-dd-yyyy	09-15-2011	No	No	No
DIN_CODE	Dinner Code	Character	Text	D3-2011	No	No	No
MEM_NUM	Member Number	Numeric	Long Integer	10010	No	Yes (MEMBER)	No
INVITE_ACCEPT	Invitation Accepted or Not	Yes/No	Y/N	Y	No	No	No
INVITE_ATTEND	How Many Attendees?	Numeric	Integer	3	No	No	No

## **Part B: Case & Requirements**

You will need to complete the following case. For the following case, please identify relevant Entities. For each entity, please identify Attributes, Primary Key (simple or composite), and Foreign Key(s). Go over Dependency and Normalization materials before developing the final ERD. You need to develop:

1. Dependency Diagrams
2. E/R diagram, and
3. Data Dictionary

You may use Microsoft Visio, Word, Access or any other suitable software. However, your final report should be a word document.

### **Case: University Classes**

This scenario models the courses, students, professors, departments, and the like at a single university in a single semester. Each student enrolls in a certain number of courses in the semester. At most one professor teaches each course. Each student receives a grade in each course he/she is enrolled in. In turn, each student evaluates the professor teaching the course. Each student has a name, a SID, and an address. A professor has a PID, a name and belongs to a department. The age of a professor can be one of young, going strong, old, very old, and still alive. Each course has a name, a number, an offering department, a classroom, a maximum enrollment, and an actual enrollment. The actual enrollment must be at most the maximum enrollment. (This university has not invented the concept of CRNs.) A student can TA a course but not a course he/she is enrolled in. Each department has a unique name. Each department has at most one chairperson who is its head (there are times when a department may not have a chairperson). Each chairperson can be the head of at most one department. Professors advise students on what courses to enroll in. Each student can have at most one advisor and must have at least one advisor. A course can have multiple pre-requisites. A course can be a pre-requisites for multiple courses. A course cannot be a pre-requisite for itself! A student enrolled in a course must have enrolled in all its pre-requisites.

At this university, more than one professor can teach a course. Students continue to get a single grade for each course. However, each student must provide an evaluation to each professor teaching a course the student is enrolled in.

## University Employees

All employees have a unique ID. In addition to professors, universities also employ staff. The university pays all its employees a salary. Professors join as one of the three appointee types: 9-month appointees, calendar year appointees, or research professor appointees. Each 9-month appointee and research professor has a grant that pays part of the employee's salary. Calendar year and 9-month professors teach classes while research professors do not.

## University Students

Students enrolled in a university can be either undergraduates or graduates. Graduate students can be enrolled either in a Master's program or a Ph.D. program. Each graduate student must submit a thesis. The thesis can be uniquely identified by its Thesis ID, Each thesis must also have a title. Each student can be a TA for at most one course. Furthermore, a course can have at most one graduate student as a TA (it may have multiple undergraduate TAs).

## Sources:

<http://www.eholyyquran.com/CompEdu/CHAPTER%204.htm>

<http://courses.cs.vt.edu/~cs4604/Fall10/lectures/handouts/handout2.pdf>

*Turn in a copy of the word document on **eLearning** on or before*

*09/08/2019, 6:30 PM. The document must include the following:*

- A cover page with the Course ID, assignment number, student name and submission date.