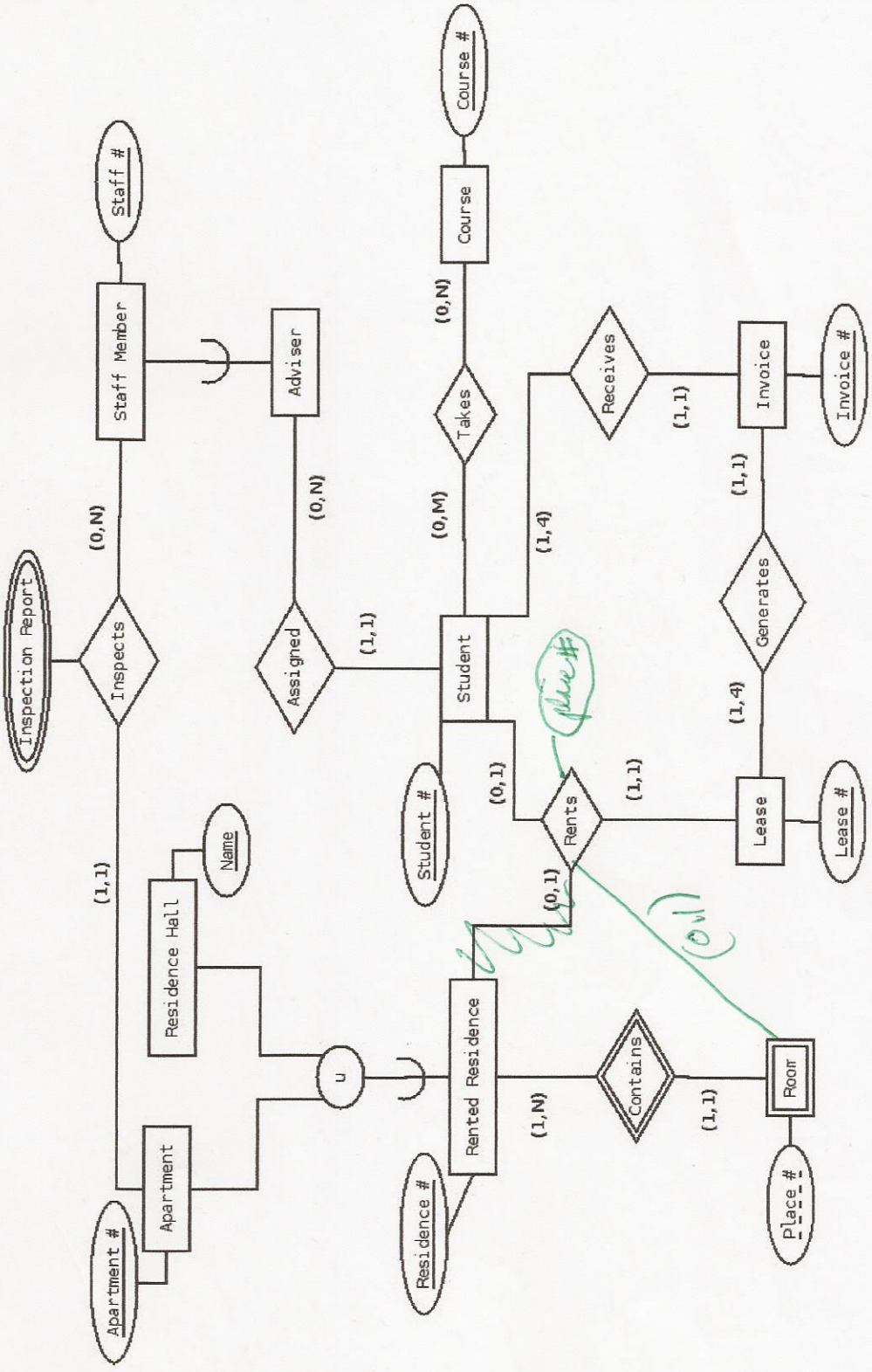
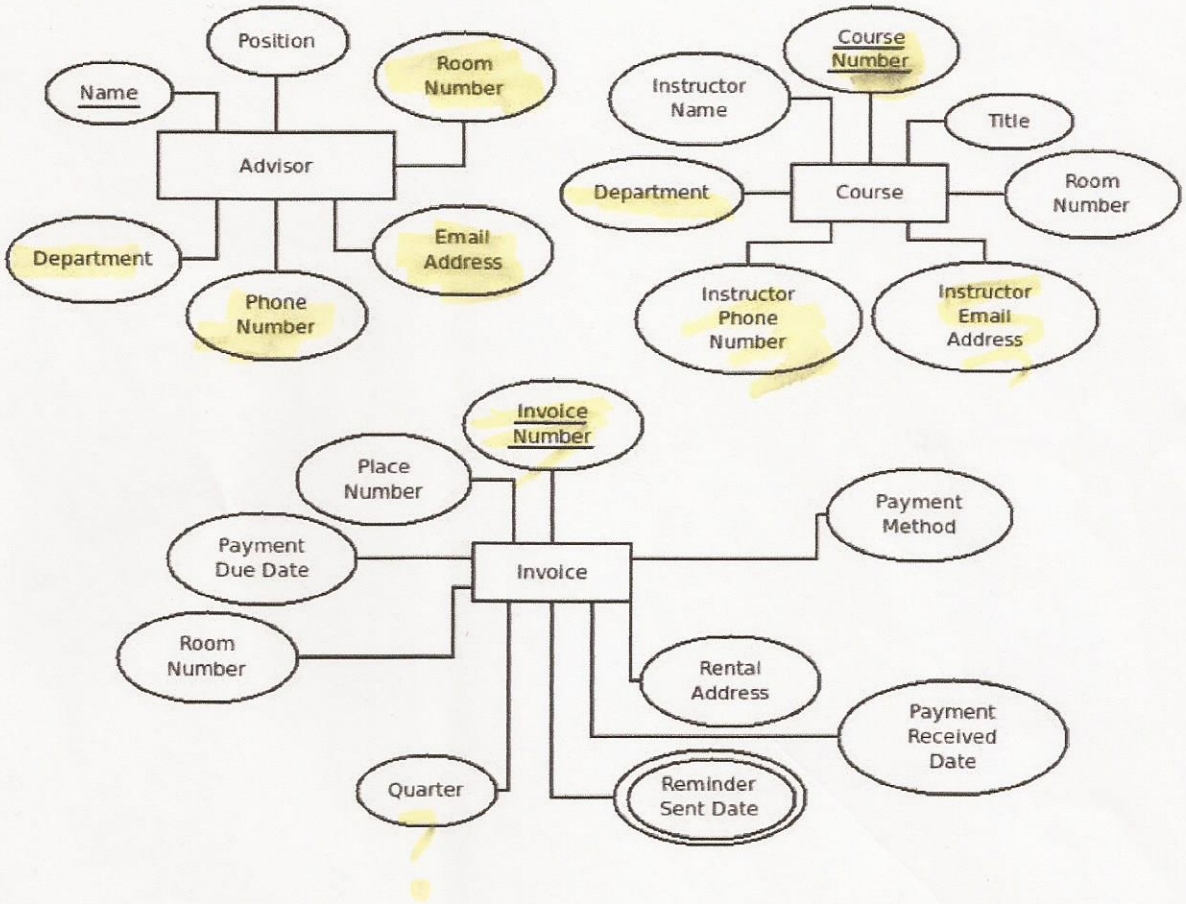
Revised

Conceptual Model: Part A2 - Relationships/Entities using Structural Constraints



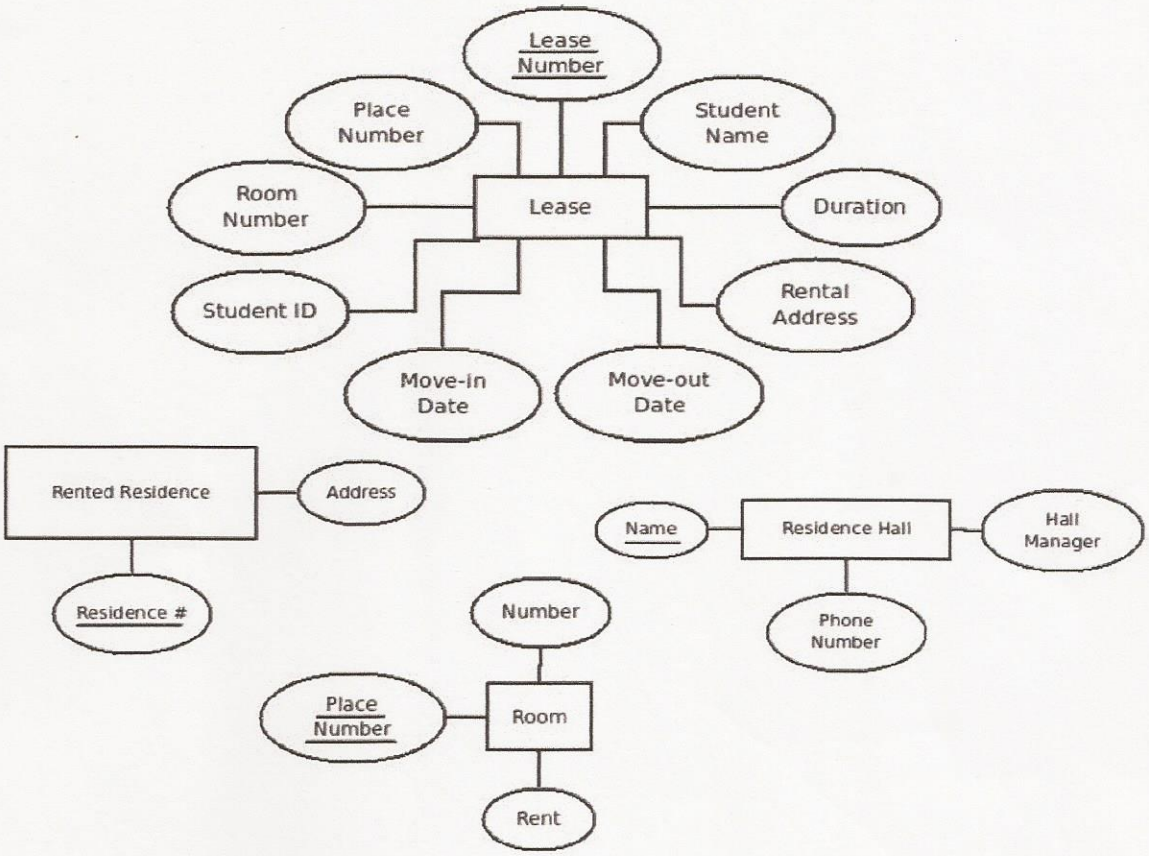
Revised

Conceptual Model: Part B - Entities/Attributes



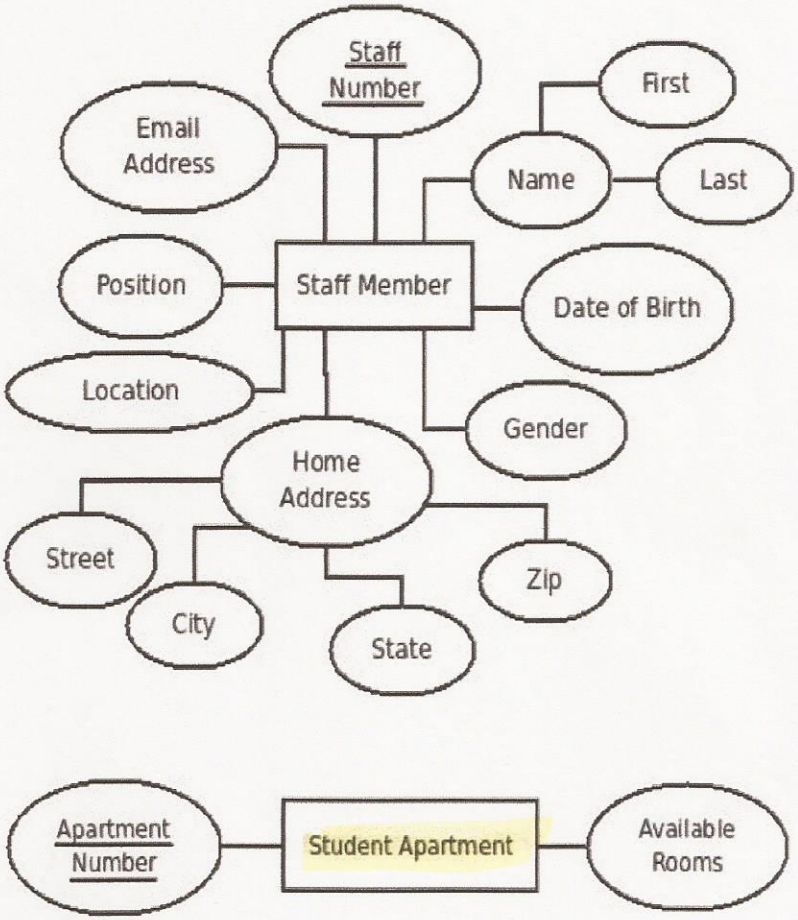
Revised

Conceptual Model: Part B - Entities/Attributes continued



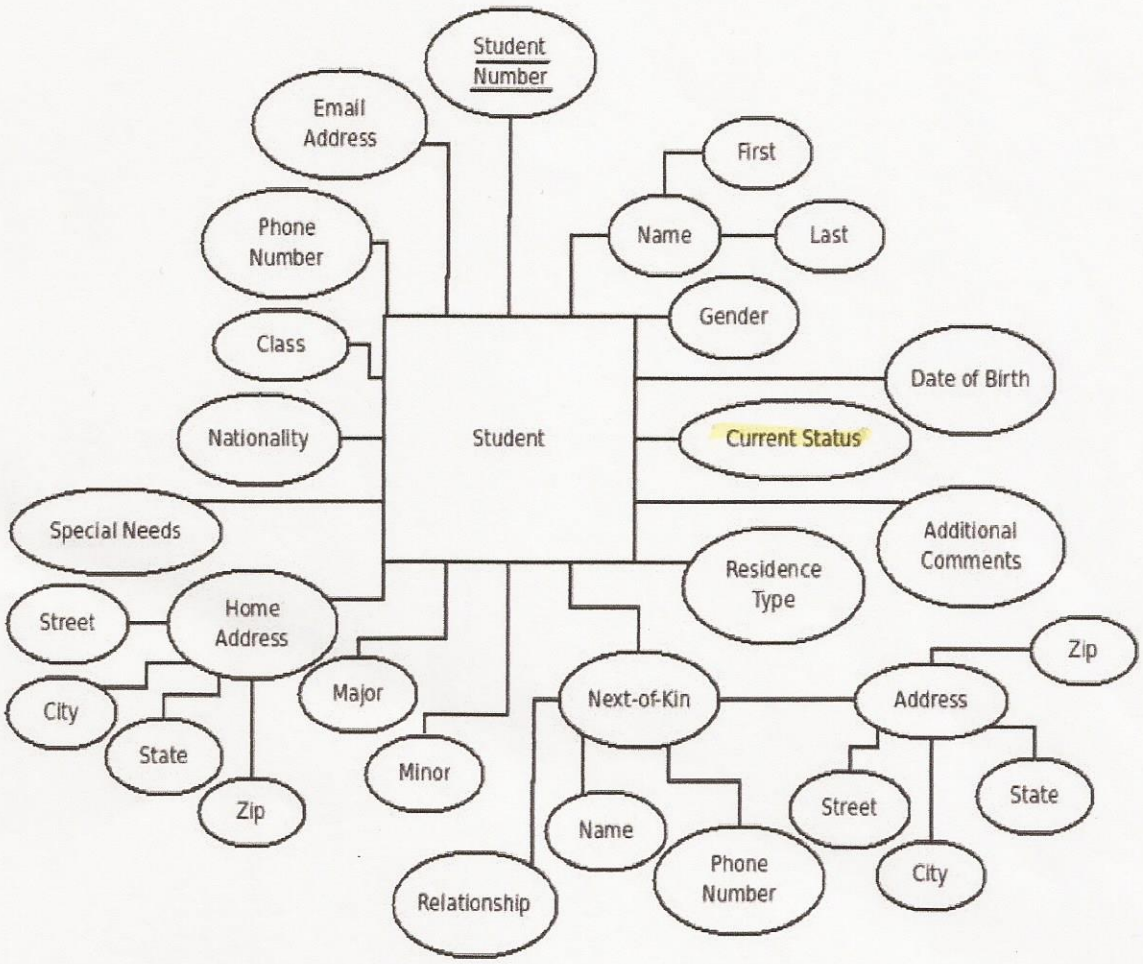
Revised

Conceptual Model: Part B - Entities/Attributes continued

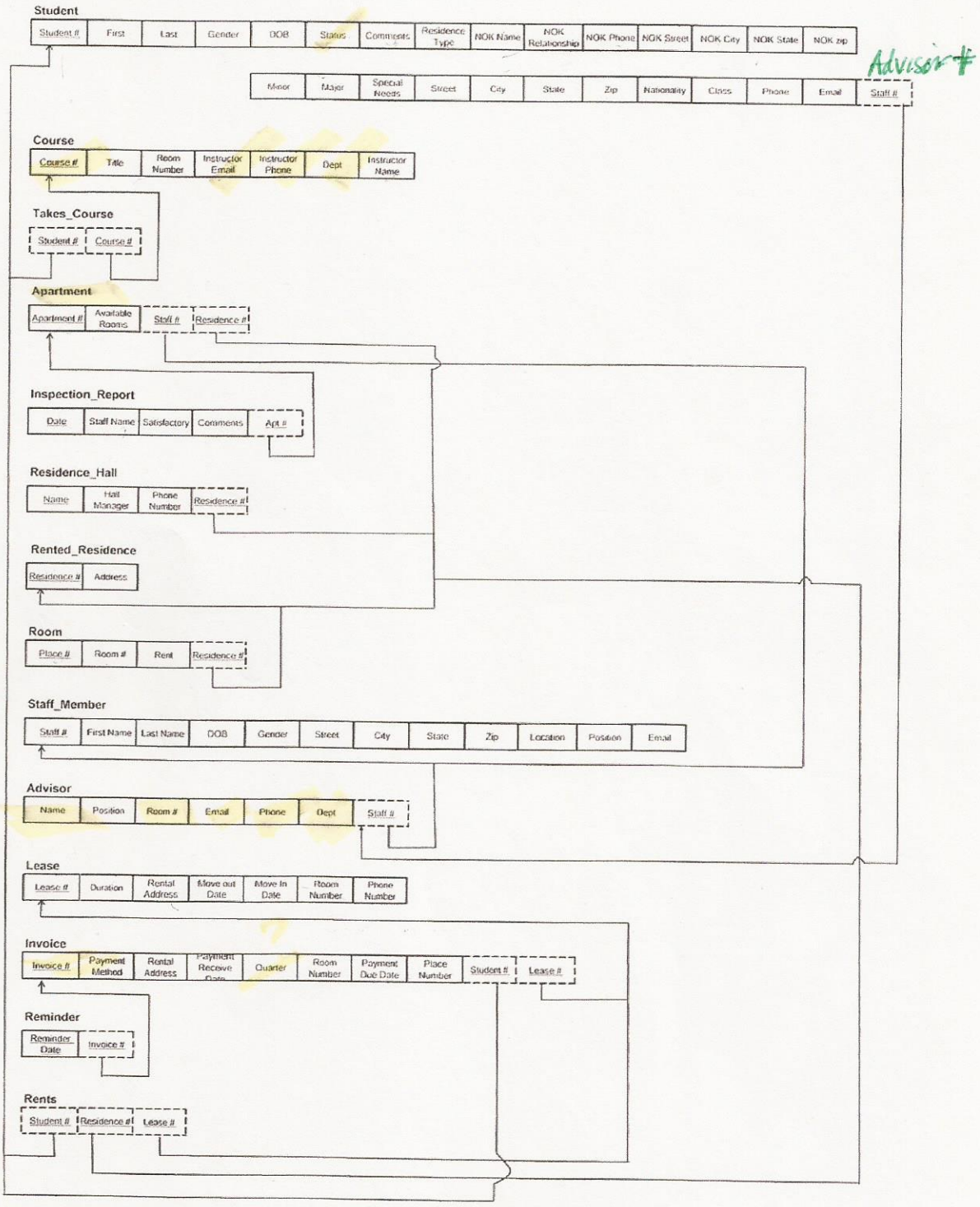


Revised

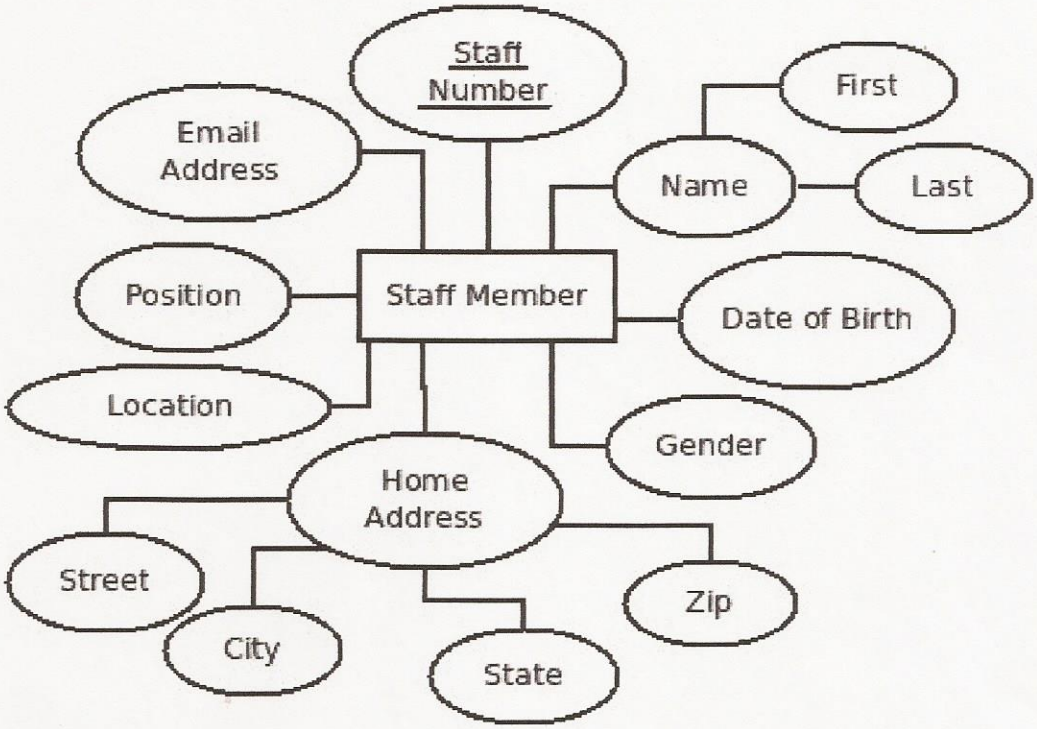
Conceptual Model: Part B - Entities/Attributes continued



Relational Model Schema



1a. Strong Entity with a Composite Attribute



Entity Diagram for Staff Member

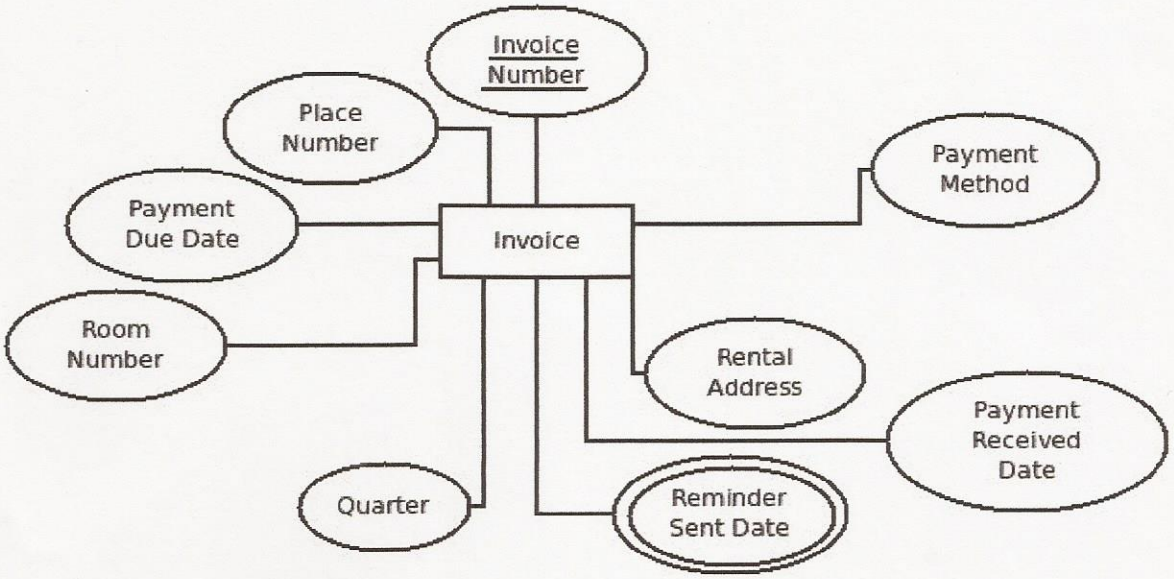
Staff_Member

Staff #	First Name	Last Name	DOB	Gender	Street	City	State	Zip	Location	Position	Email

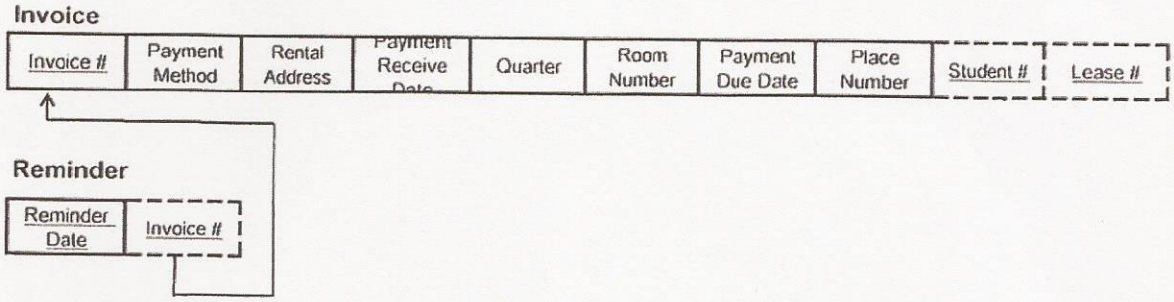
Relational Diagram for Staff Member

Explanation: In the case of Staff Member's composite attribute 'Home Address', the parent attribute was omitted. All that was needed to be done was to place all the leaf attributes that were connected to the composite in the relation. In this case, Street, City, State, & Zip were placed directly into the relation.

1b. Strong Entity with a Multi-valued Attribute



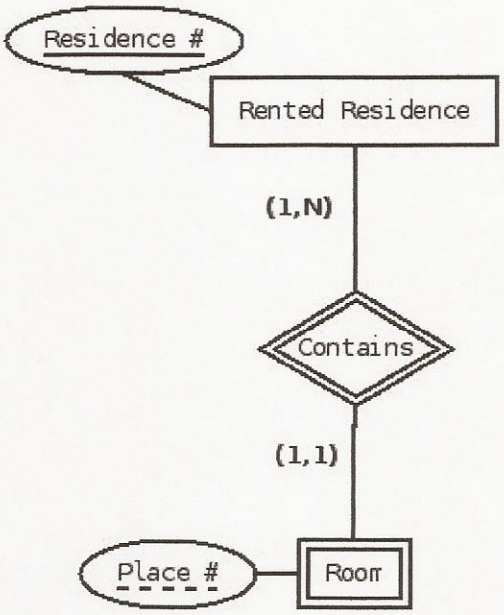
Entity Diagram for Invoice



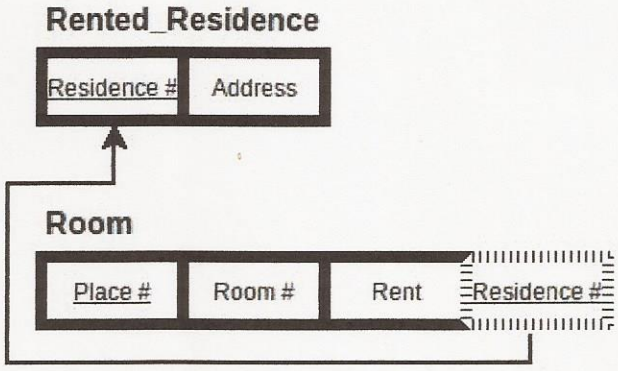
Relational Diagram for Invoice

Explanation: To convert the Invoice entity into an equivalent relational model it was necessary to employ both the 1st and 6th step mentioned in Chapter 9 of the text. The primary key for Invoice, 'Invoice #' along with all the singular attributes are included in the Invoice table. Appended to the end of the Invoice relation is the foreign key 'Lease #' which links Invoice to the Lease entity via the Generates relationship. In order to properly convert Invoice's multi-valued attribute 'Reminder Sent Date', a new relation, called Reminder, was formed which includes the attribute itself along with Invoice's primary key 'Invoice #' as a foreign key.

1d. Weak Entity



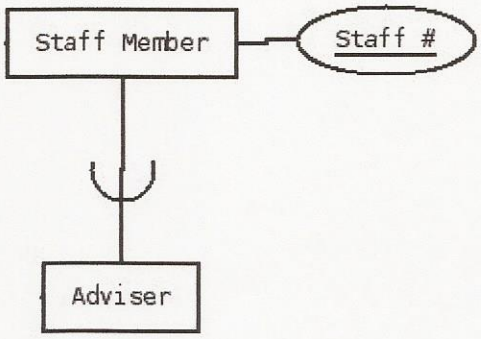
Entity-Relationship Diagrams for Room and Rented Residence



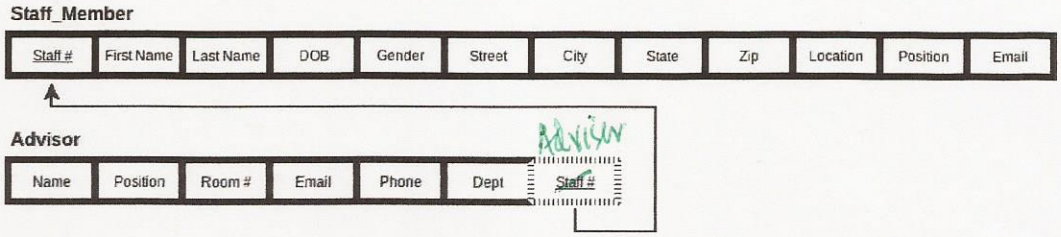
Relational Diagrams for Room and Rented Residence

Explanation: Converting the Room entity into a table is straightforward, as it only has three attributes, namely Place Number, Number (of the room) and Rent. Also included in the relation for Room is Residence #, the foreign key linking Room to the Rented Residence entity via the identifying-relationship Contains.

1e. Specialization/Generalization/Aggregation



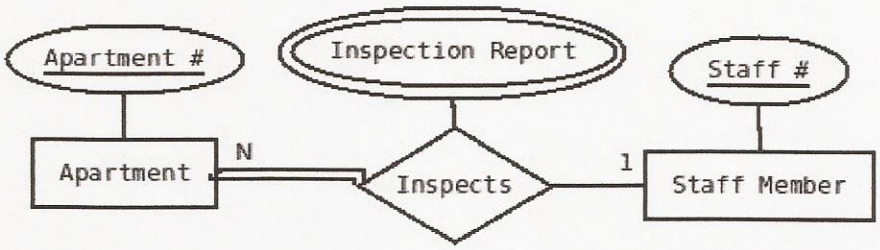
Entity-Relationship Diagram for Staff Member and Advisor



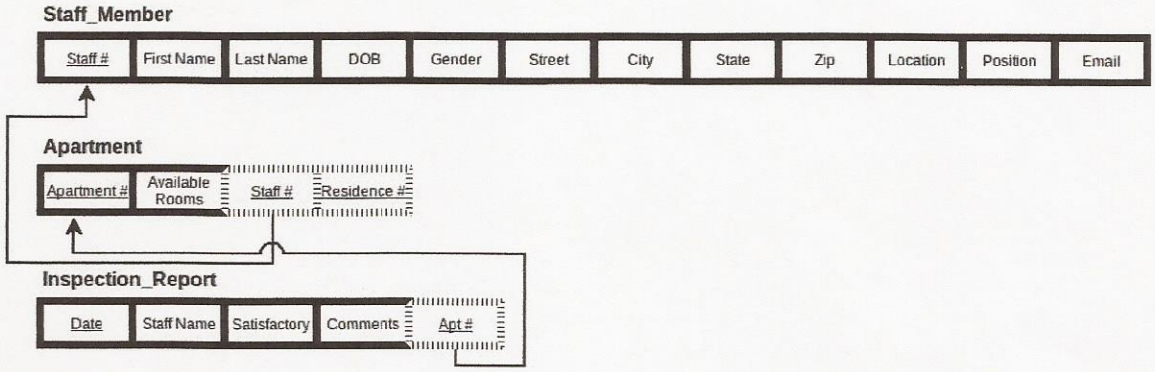
Relational Diagram for Staff Member and Advisor

Explanation: To convert the the specialization/generalization relationship that exists between Staff Member and Adviser, the Staff_Member relation and all its attributes was added, along with the Adviser relation and all it's attributes. Using option 8A from Chapter 9 of the textbook to make the conversion, the primary key from Staff_Member, Staff #, was added as a foreign key to Adviser. By add this is a foreign key, the relational schema now matches the entity relationship above.

1f. 1-M Relationship



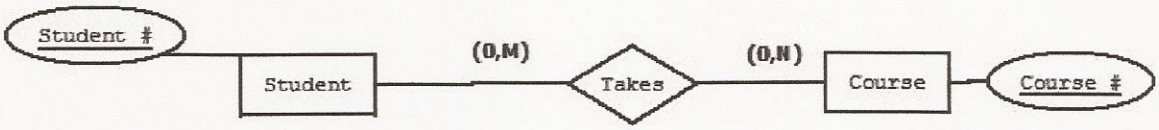
Entity-Relationship Diagram for Staff_Member, Apartment and Inspection_Report



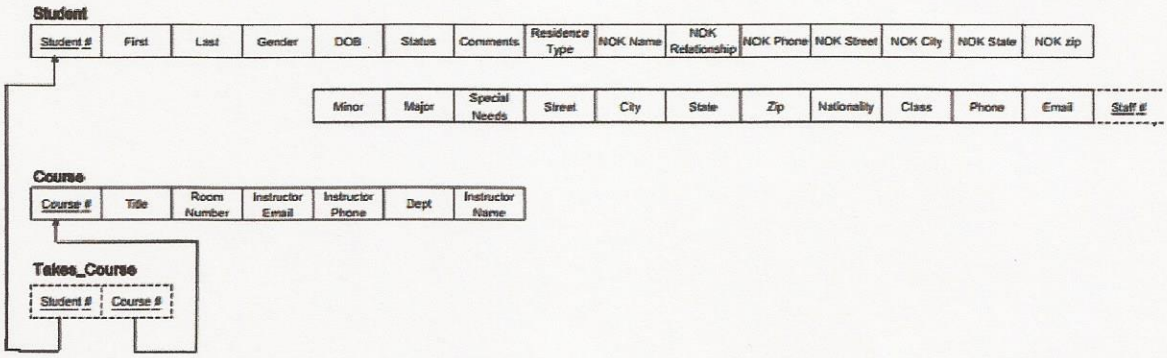
Relation Diagram for Staff_Member, Apartment and Inspection_Report

Entities: Staff Member, Apartment
Relationship Attributes: {Inspection Report (Date, Staff Name, Satisfactory, Comments)}
Cardinality Explanation: A staff member may inspect many apartments and each apartment inspection is done by one staff member.
Participation: Apartment has total participation in the relationship, because all apartments must be inspected. Staff Member has partial participation, because not all staff members carry out inspections.
Conversion Explanation: Because Apartment has total participation in the Inspects relationship (which is 1-M), the primary key of Staff Member is added to the Apartment relation as a foreign key. 'Inspection Report', the composite, multi-valued attribute of the Inspects relationship becomes the 'Inspection_Report' relation with all of the composite attributes and the primary key of Apartment, 'Apartment #' as a foreign key.

1h. M-N Relationship



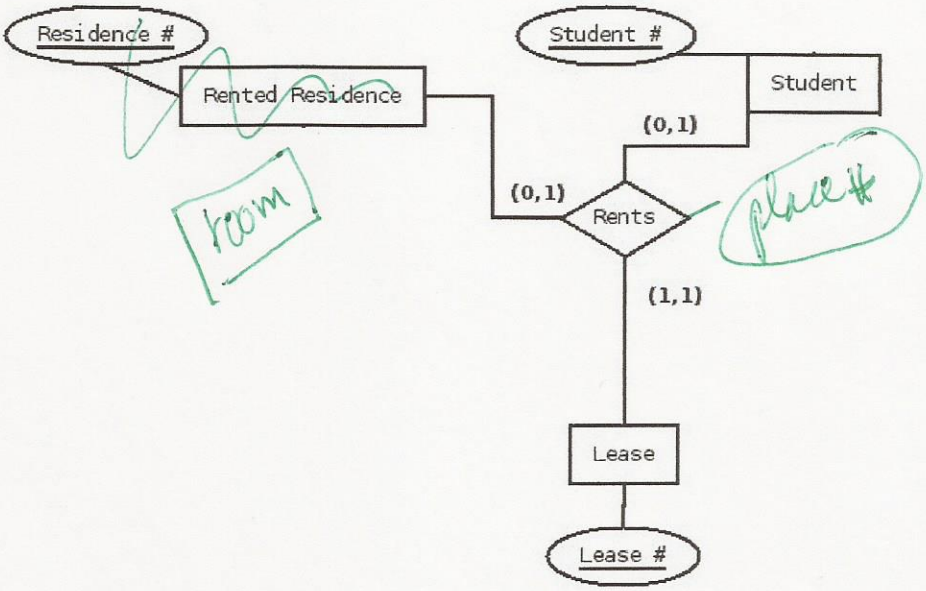
Entity-Relationship Diagram for Student and Course



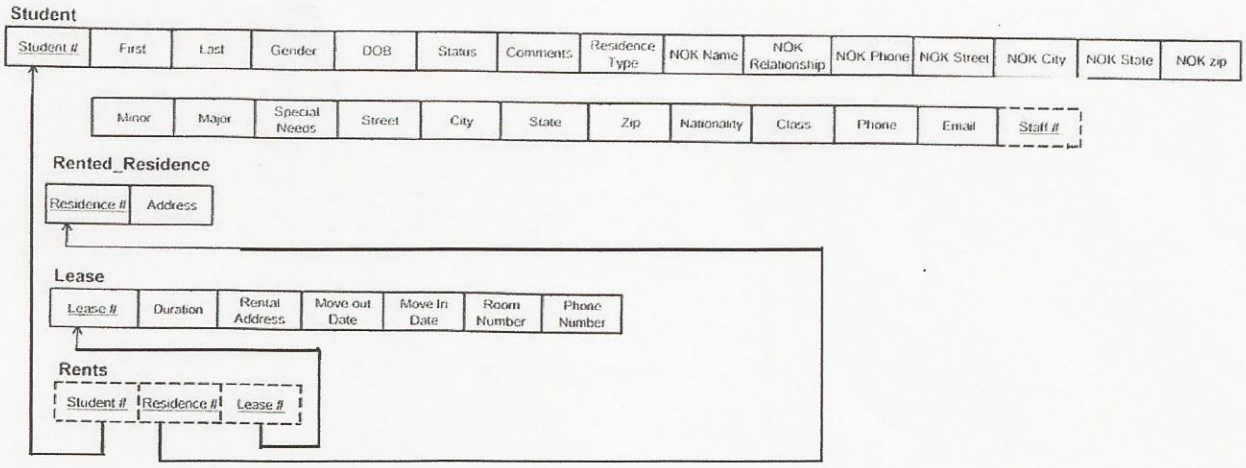
Relation Diagram for Student, Course, and Takes_Course

Entities: Student, Course
Relationship Attributes: None
Cardinality Explanation: Looking at the Entity Relationship diagram, it shows that a student can enroll in 0 to many different courses, while a course can have 0 to many students as well.
Participation: Both sides have partial participation
Conversion Explanation: In order to convert the Entity Relationship diagram to the relational diagram, you first start out with step 1 from Chapter 9 of the textbook and add as a relation each entity involved in the many to many relationship. In this case, it is the Student and Course entities. Included in each relation is all the attributes associated with each entity. Next to show the many to many relationship between the two entities, we need a new relation that we called Takes_Course. This relation only has two attributes. First is the primary key of the Student relation, and second is the primary key from the Course relation. Both of these primary keys are added as foreign keys in the Takes_Course relation we created.

1i. Ternary Relationship



Entity-Relationship Diagram for Student, Rented Residence, & Lease



Relation Diagram for Student, Rented Residence, Lease, Rents

Entities: Student, Rented Residence, Lease
Relationship Attributes: None
Cardinality Explanation: Looking at the Entity Relationship diagram, it shows a ternary relationship between the entities. The structural constraints show that a student and rented residence can exist without this relationship, but a lease, since it's min is 1, has to be involved with one rents relationship to exist. It also shows that the rents relationship will contain only one of each of the entities, Student, Rented Residence, Lease. These three entities together form the ternary relationship.

1i. Ternary Relationship Continued

Participation: Student and Rented Residence have partial participation in the relationship, while Lease has total participation.

Conversion Explanation: In order to convert this ternary ER diagram into a relational schema, a new relation must be created. This relation, that is called Rents, ties the other three relations together. The primary keys of Student, Rented Residence, and Lease are included in this Rents relation as foreign keys. Since there are no attributes for the Rents relationship, the three foreign keys is all you need.

California State University, San Bernardino
School of Computer Science & Engineering
CSE 572 – Database Systems Fall 2013

Rating Sheet : Project Part IIA – Relational Data Model (CRO)
for TEAM: King James & Knights of the Data Table

Carbajal: 42/50 **Small: 42.6/50** **Takahashi: 42/50** **Urbach: 43/50**

Presentation ..... Subtotal: 5 /5

Format & Completeness ..... 5 / 5

__ Dividers with Tags
__ Page Numbers
__ Order of Sections
- __ Divider Page: PART IIA: Logical Model – Relational Model tab label
- __ COVER Page (See p4 for format and no footer)
- __ Revised ERD/EERD: Part I-A2 (Entities with PK & Relationships Only – Structural Constraint) If no revisions, provide a copy of ERD/EERD: Part A2
- __ Revised ERD/EERD: Part I-B (Entities with Attributes Only) If no revisions, provide a copy of ERD/EERD: Part I-B
- __ Relational Model Schema
  Present only the relations and attributes. PK must be underlined. **Attributes added because of relationships must be indicated by dashed boxes.** Foreign key constraint arrows must be included in the relational model schema.
- __ Conversion Description (one page per item)
  - ___ a. one strong entity that has a composite attribute
  - ___ b. one strong entity that has a multivalued attribute
  - ___ c. one strong entity with a derived attribute
  - ___ d. one weak entity
  - ___ e. one specialization/generalization/aggregation (if any)
  - ___ f. one 1-M relationship
  - ___ g. one 1-1 relationship
  - ___ h. one M-N relationship
  - ___ i. one ternary relationship or n-ary relationship (if any)

__ Comments
- __ A. Difficulties and Resolution (summarized by team leader)
- __ B. Likes/Dislikes (each member and team leader)
- ___ C. Most Challenging (each member and team leader)
- ___ D. Suggestions on how to improve this part of project specs (each member and team leader)
- __ E. Changes to Communication Methods? If yes, why?

__ *Spelling*
X *Grammar* see p.11

Content .....**Subtotal : 29 / 35**

Use one page per item and on each page, include the ER/EER construct from the Conceptual Model that pertains to the item you have chosen and followed by the equivalent relational diagram and explanation of how the conversion was done.

4 Conversion of Entities (5 pts)

____ *Strong Entity*

____ *Weak Entity*

___ Title header
___ ER/EER Construct
___ Conversion Procedure to RM

____ *Primary Key for Strong Entity*

X *Partial Key for Weak Entity* Partial key for ROOM should be Room# and not Place#.

NOTE: Proj Desc says that place number uniquely identifies each room in all student apartments and is used when renting a room to a student.. The place number uniquely identifies each room in allhalls and is used when renting a room to a student.

5 Conversion of *Attributes* (5 pts)

___ Composite
___ Title header
___ ER/EER Construct
___ Conversion Procedure to RM

___ Multivalued
___ Title header
___ ER/EER Construct
___ Conversion Procedure to RM

___ Derived
___ Title header
___ ER/EER Construct
___ Conversion Procedure to RM

12 Conversion of *Relationships* (15 pts)

*** 1 – title header**
*** 2 - list the entities that participate in the relationship**
*** 3 - list the attributes of the relationship, if any**
*** 4 - express in English what the cardinality means using the business rules that pertain to the entities that participate in the relationship (i.e. semantics)**
*** 5 - identify which entity that participates in the relationship has a total or partial participation in the relationship**
*** 6 - explain how the relationship in the ERD/EERD is converted or translated into the relational model.**

____ 1-1
X 1-M In the ER Model, the attribute Staff_Name should not be an attribute of Inspection Report since Staff Member is connected to Inspects!
____ M-N
X Ternary or n-ary see my notes on page 15
____ Foreign Key

3 Generalization/Specialization/Aggregation (5 pts)

___ Title header
___ ER/EER Construct
___ Conversion Procedure to RM
X name all options considered in the conversion; and indicate what option was chosen and why this is option is chosen. Failed to give all the options possible and indicate why option 8A was chosen!

5 Comments (5 pts)

___ Difficulties (Summarized by Team Leader)
___ Likes/Dislikes (Each Member and Leader, alphabetical)
___ Most Challenging (Each Member and Leader, alphabetical)
___ How to Improve this Part (Each Member and Leader, alphabetical)
___ Changes to Communication Tools (Each Member and Leader, alphabetical) If yes, why?

TEAM Grade ..... **34** / 40

Team Evaluation..... /10

Criterion	Carbajal	Small	Takahashi	Urbach
On time email submission (1)	1	1	1	1
Correct format (1)	1	1	1	1
Quality of Evaluation (4)	3	3	3	3
Avg rating by team members (4)	(7+16+15) /3 = 13 → 3	(19+18+19) /3 = 18 → 3.6	(10+14+13) /3 = 12 → 3	(16+16+16) /3 = 16 → 4
Individual Rating	8	8.6	8	9

Comments:

Strengths:

- Excellent team dynamics
- Very good understanding of conceptual model, relational model
-

Areas for Improvement:

- ***Inconsistent: The attribute names used in the relational model schema do not match exactly the attribute names used in the conceptual model for the entities! Some of the entity names do not match the relation names... see highlighted sections on pages2,4-6.***
  PROOF READ! PROOF READ! PROOF READ!