

Slide Set 3: Entity Relationship Model

Entity Relationship Model

- ❖ A detailed, logical representation of the entities, associations, and data elements for an organization or business area.
- ❖ Graphical model of the people, places, objects, things, events, or concepts, their characteristics and relationships, for an organization or business area.
- ❖ A graphical *interpretation* of reality
- ❖ Repeated until the end users and designers agree that the Entity Relationship Model is a fair representation of the organization's activities and functions.

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Why do Conceptual Modeling?

- ❖ Independent of technology
- ❖ Understandable representation of organizational data
- ❖ Strong foundation for the development process
- ❖ Helps to elicit business rules
- ❖ Communication *tool* between designers and clients/end users
- ❖ Easier to **FIX ERRORS** early in DB development process (during modeling) rather than later (during physical implementation)

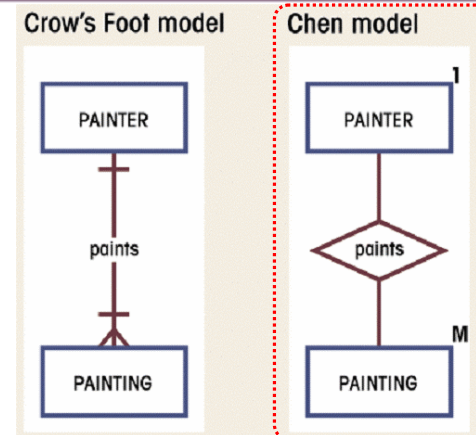
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Entity Relationship Diagram (ERD)

- ❖ 2D Graphical Entity Relationship Model.
- ❖ Rectangles are used to represent entities.
- ❖ Entity names are nouns and capitalized.
- ❖ Diamonds are used to represent the relationship(s) between the entities and usually expressed with a verb.
- ❖ The number 1 is used to represent the "1" side of the relationship.
- ❖ The letter M or N is used to represent the "many" sides of the relationship.

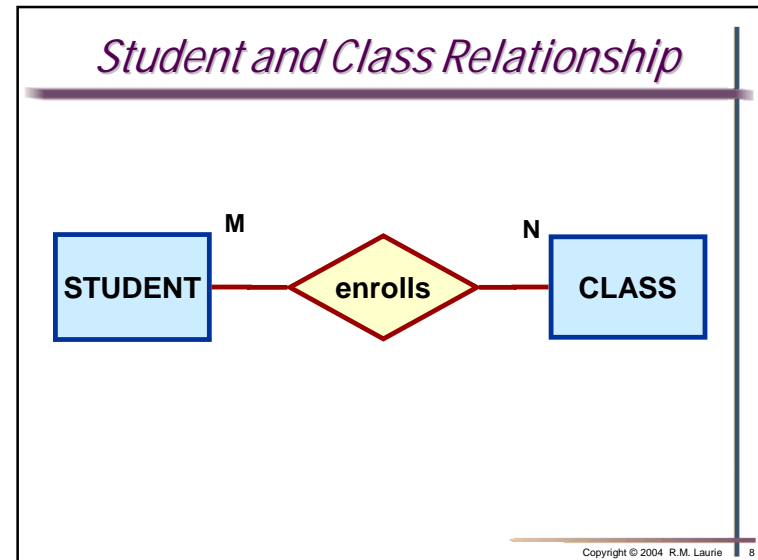
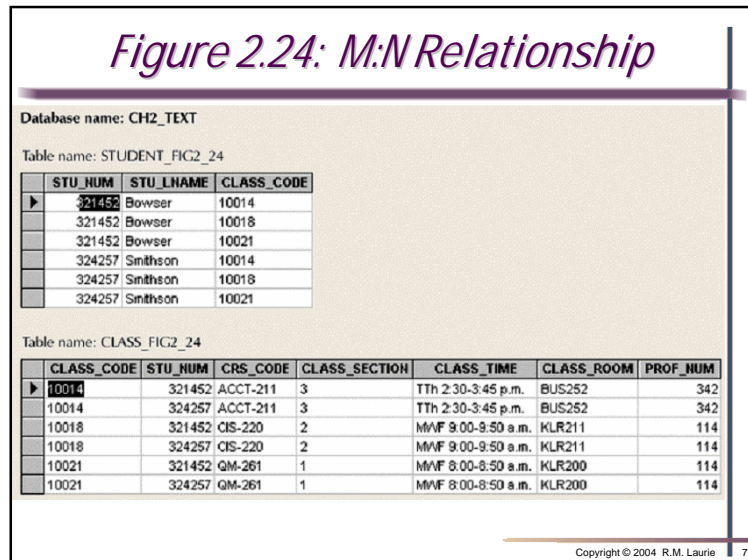
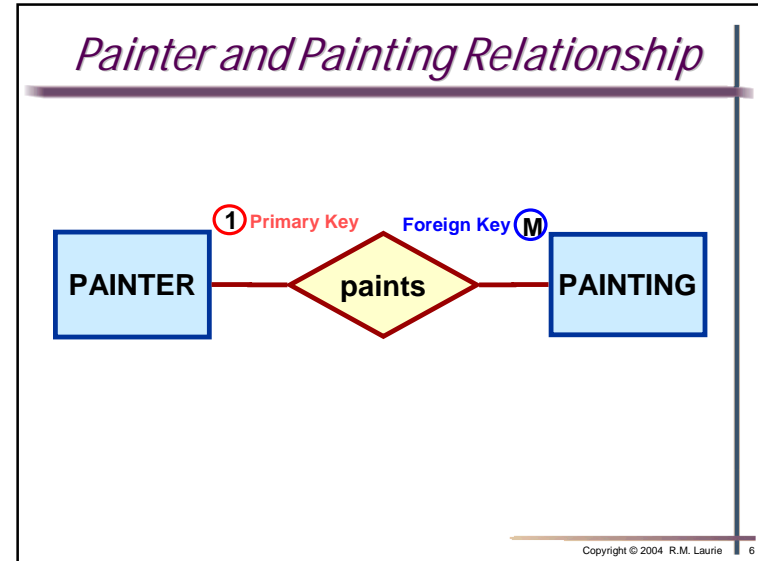
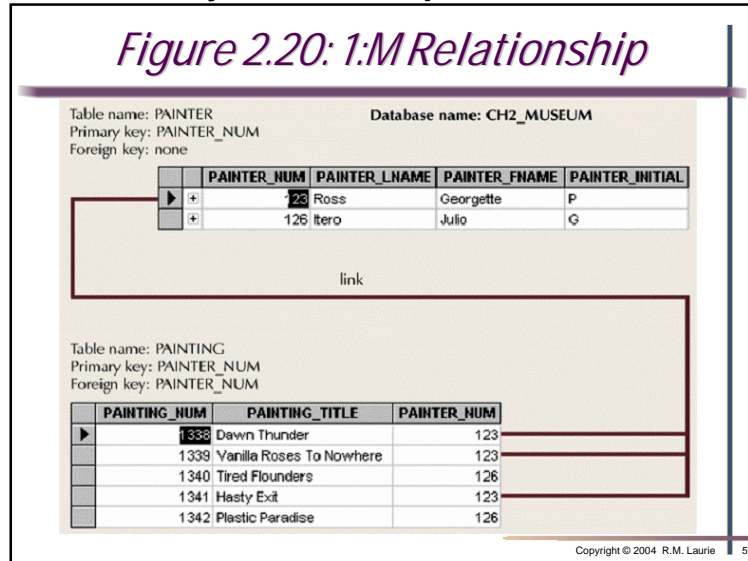
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Figure 2.18: 1:M Relationship



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M:N Relationships

- ❖ **The Curse of M:N Relationships**
 - ◆ Entity Integrity does not exist
 - ◆ No Primary Key Field
 - ◆ Therefore, no Referential Integrity
 - ◆ Many redundancies lead to anomalies
- ❖ **The Solution**
 - ◆ Create a Composite Entity
 - ◆ Also Known As:
 - ◆ Bridge Entity
 - ◆ Associative Entity
 - ◆ Gerund
 - ◆ Composite Entity is placed between M:N entities and decomposed into two 1:M relationships

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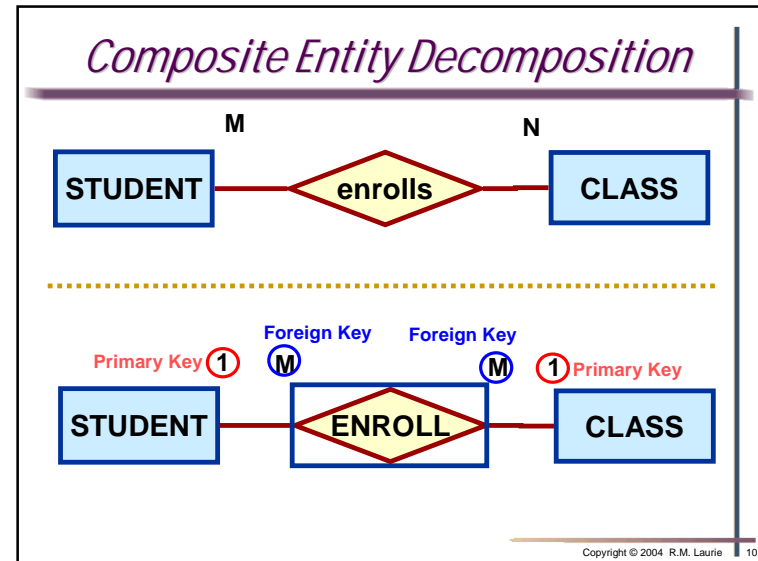


Figure 2.25: M:N Decomposition

Table name: STUDENT_FIG2_25
Primary key: STU_NUM
Foreign key: none

STU_NUM	STU_LNAME
321452	Bowser
324257	Smithson

Table name: ENROLL_FIG2_25
Primary key: CLASS_CODE+STU_NUM
Foreign key: CLASS_CODE, STU_NUM

CLASS_CODE	STU_NUM	ENROLL_GRADE
10014	321452	C
10014	324257	B
10018	321452	A
10018	324257	B
10021	321452	C
10021	324257	C

Table name: CLASS_FIG2_25
Primary key: CLASS_CODE
Foreign key: CRS_CODE

CLASS_CODE	CRS_CODE	CLASS_SECTION	CLASS_TIME	CLASS_ROOM	PROF_NUM
10014	ACCT-211	3	TTh 2:30-3:45 p.m.	BUS252	342
10018	CIS-220	2	MWF 9:00-9:50 a.m.	KLR211	114
10021	QM-261	1	MWF 8:00-8:50 a.m.	KLR200	114

