

〈3주차 실습〉

ER-Win(1)

Database Programming



ER-Win 실행



Entity 생성



식별/비식별 관계



다대다 관계



Subtypes



Strong Entity Patterns



실습 과제

ERwin Data Modeler

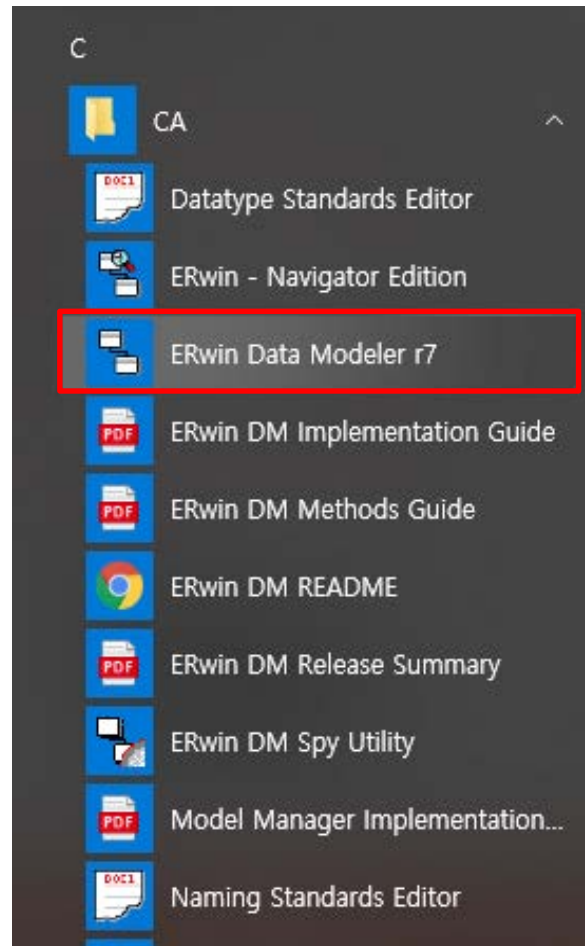
1. 사용하기 쉽고 강력한 기능을 지닌 데이터 모델링 도구로서 데이터베이스를 빠르고 쉽게 설계할 수 있도록 지원

2. GUI 환경의 쉬운 작업으로 인한 개발기간의 단축 데이터베이스 모델링에 대한 개발 방법론이 적용된 프로그래밍 자동화 도구

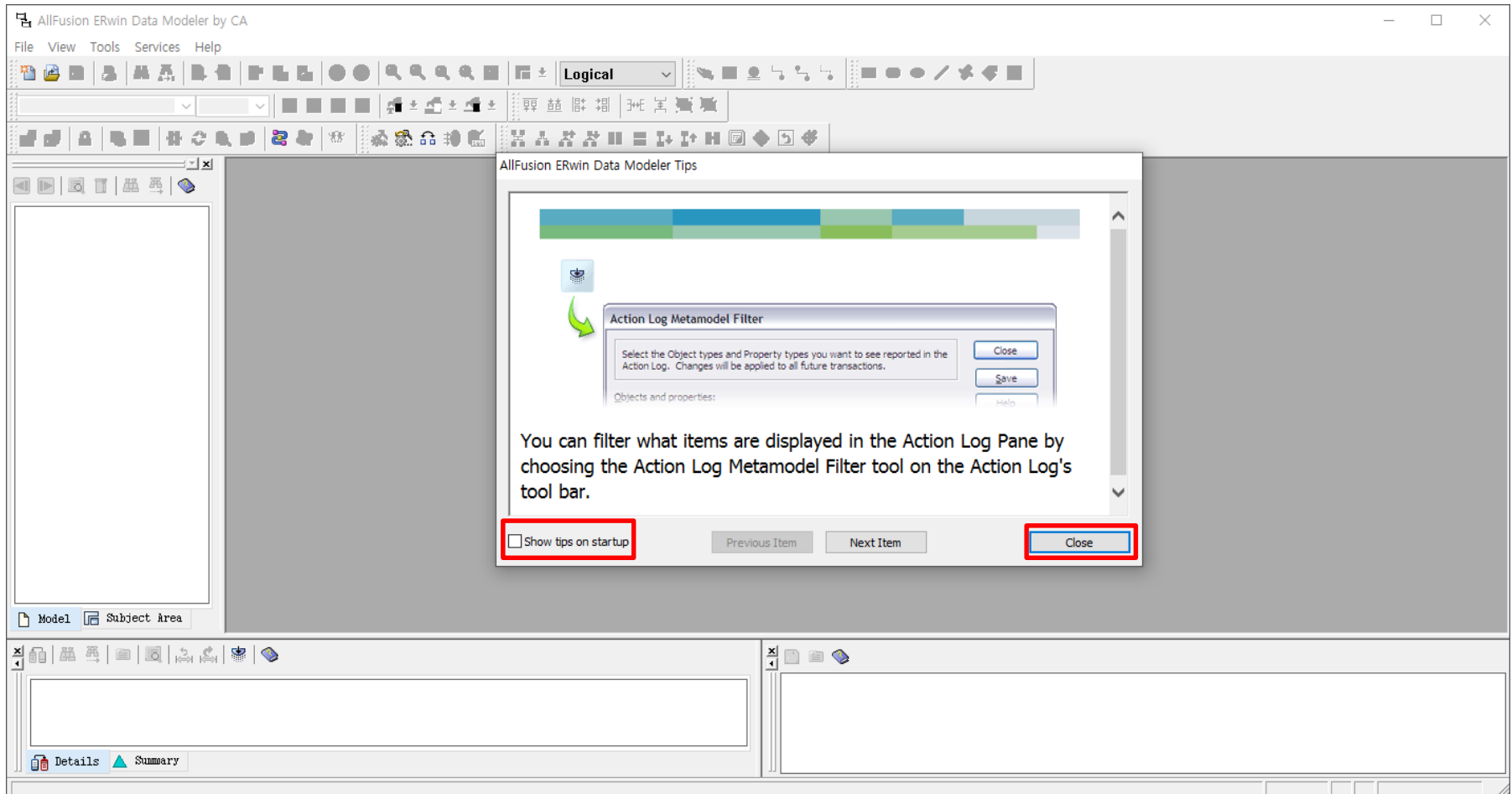
(CASE Tool : Computer Added Software Engineering)

3. 유지보수/운영 환경에서 ERD와 DBMS 스키마 정보의 지속적인 관리

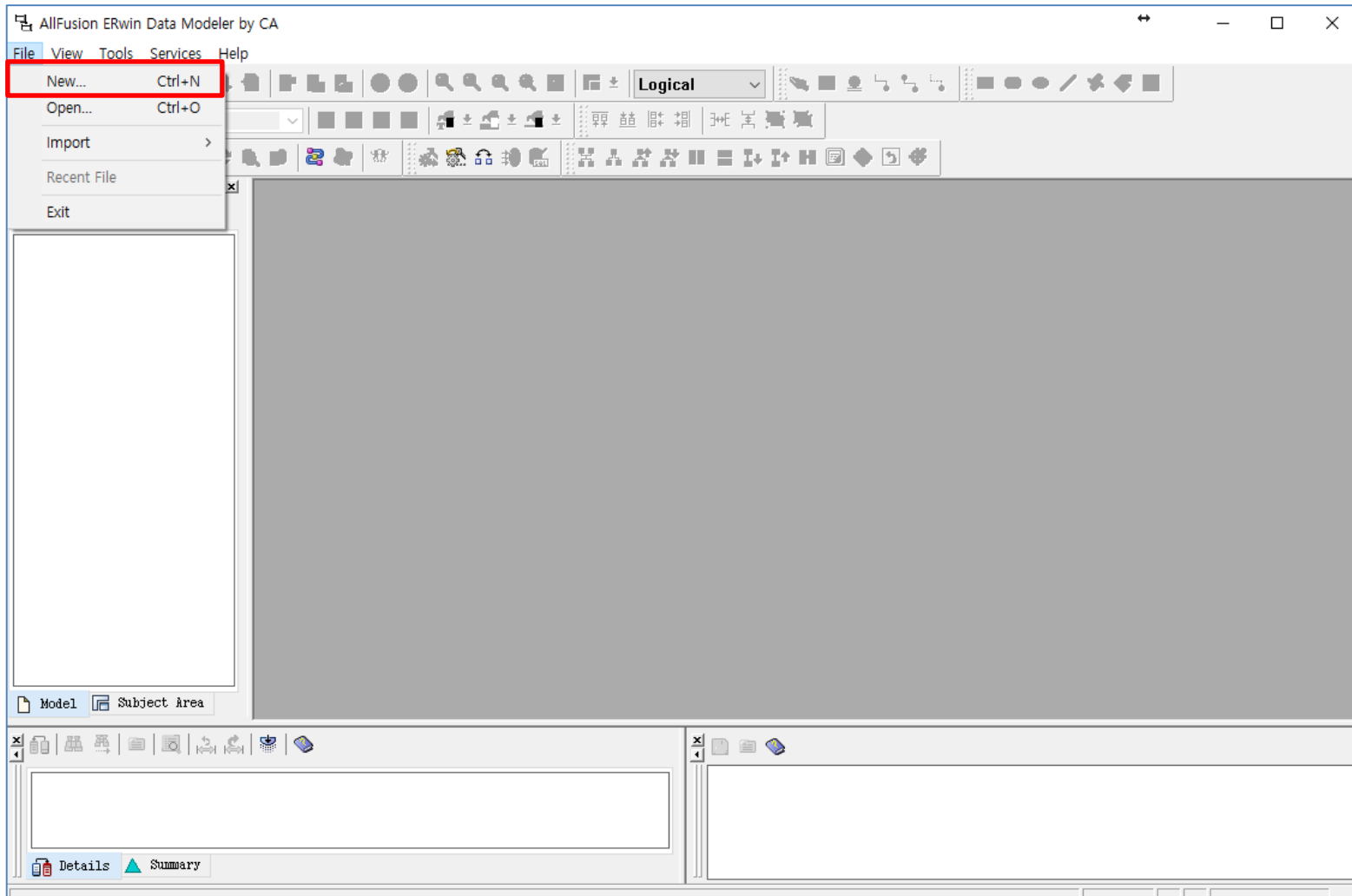
- 시작 → CA → Erwin Data Modeler r7



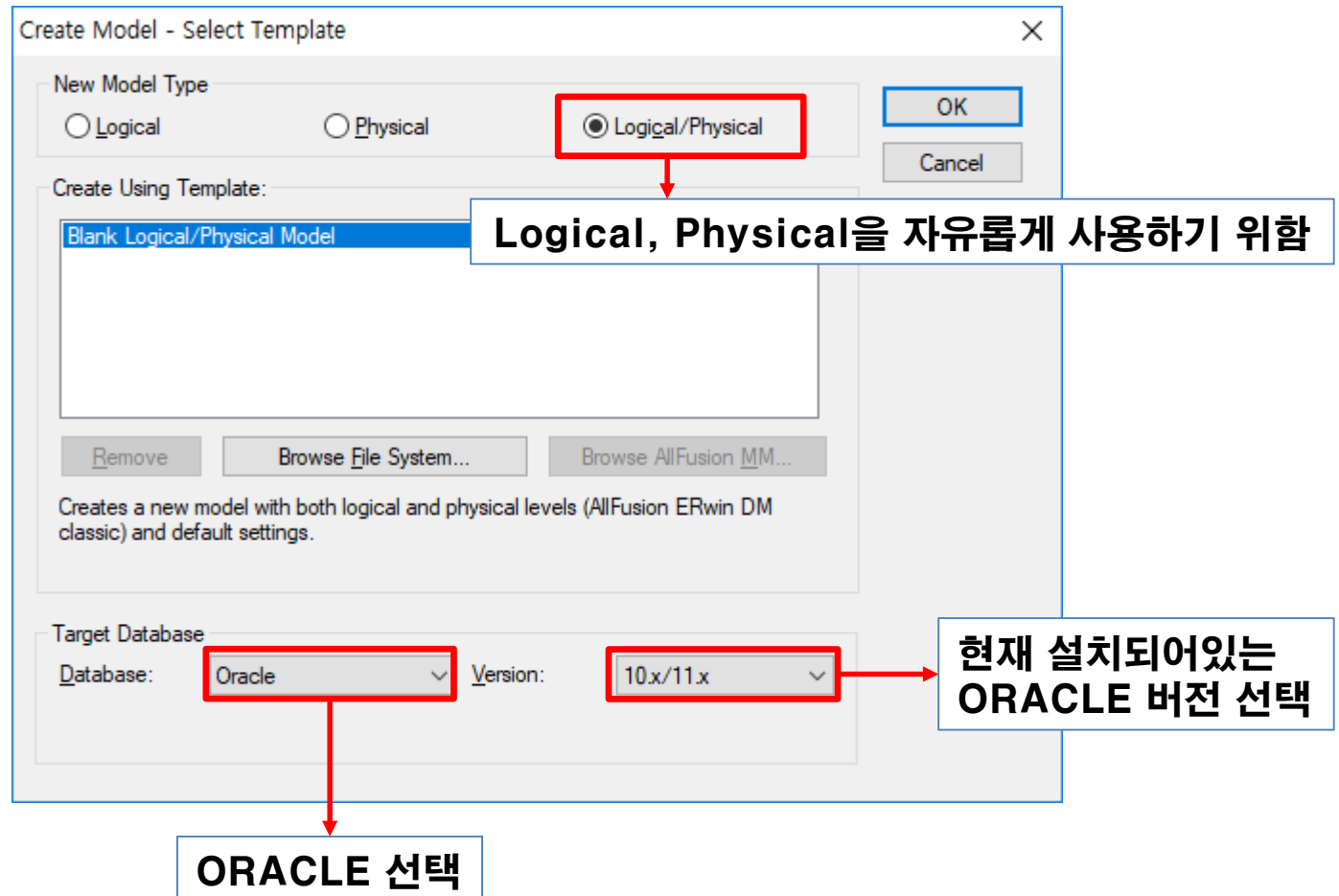
- Show tips on startup 체크 해제 → Close 클릭



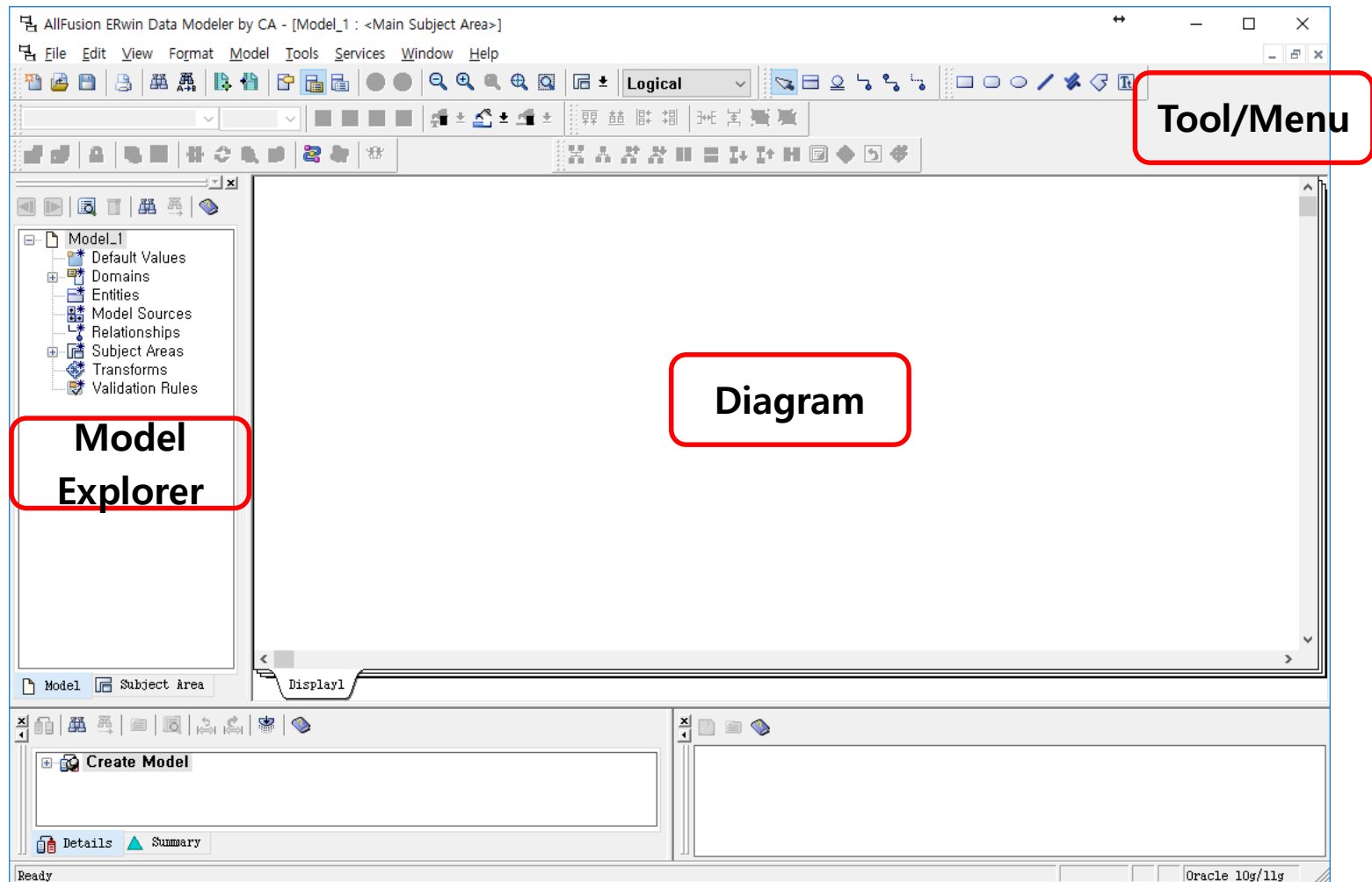
- 왼쪽 상단의 메뉴에서 File 클릭 후 New 클릭



- 아래 그림을 참고하여 설정한 뒤 OK 버튼 클릭

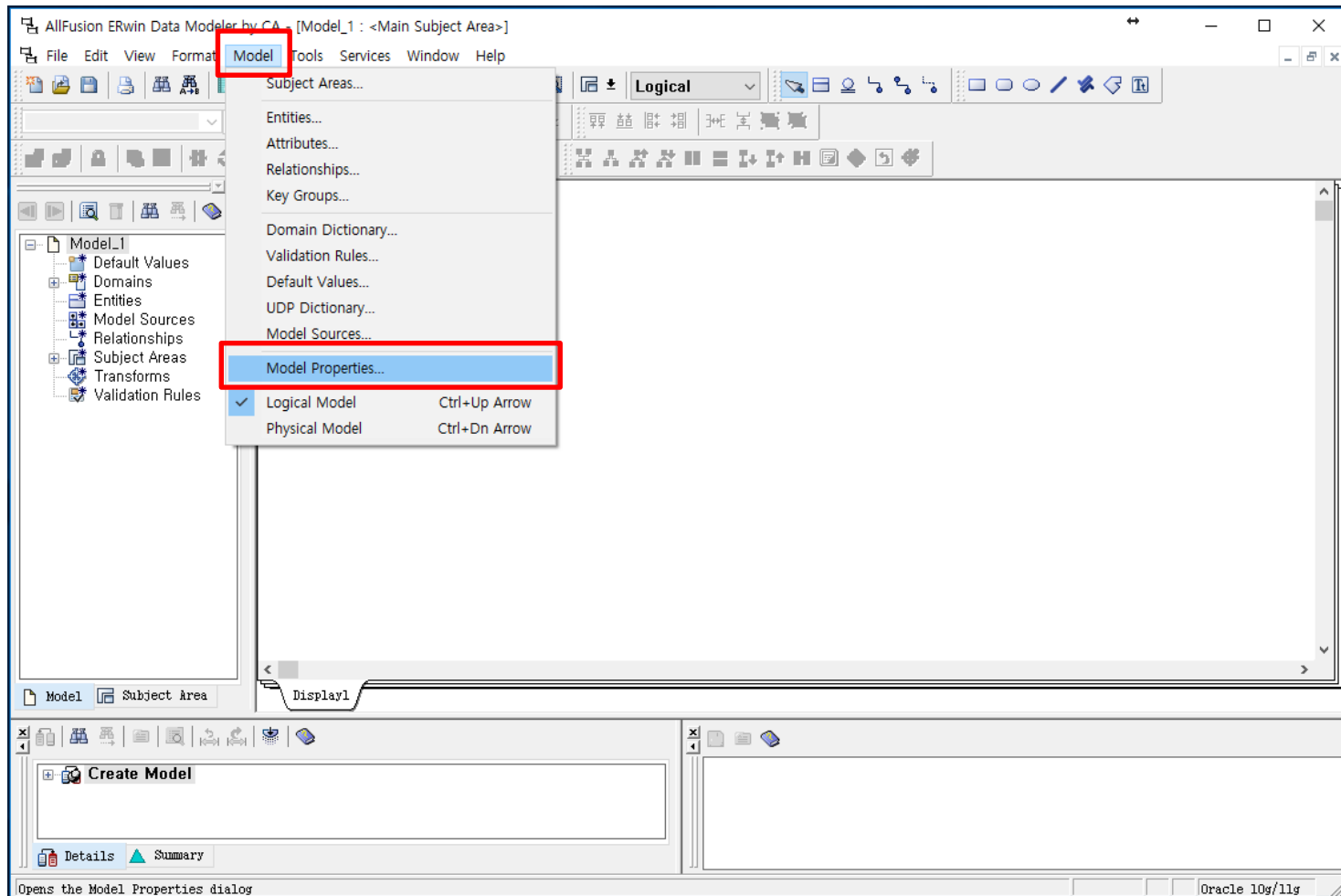


- 화면 구성

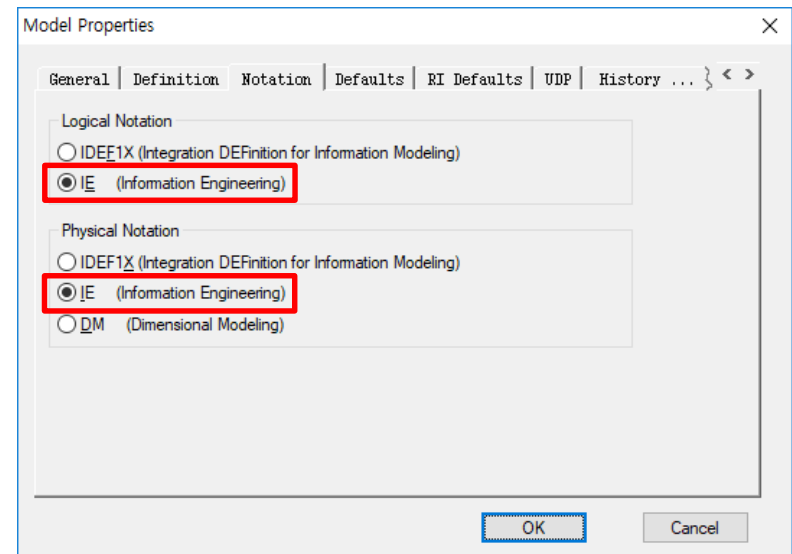
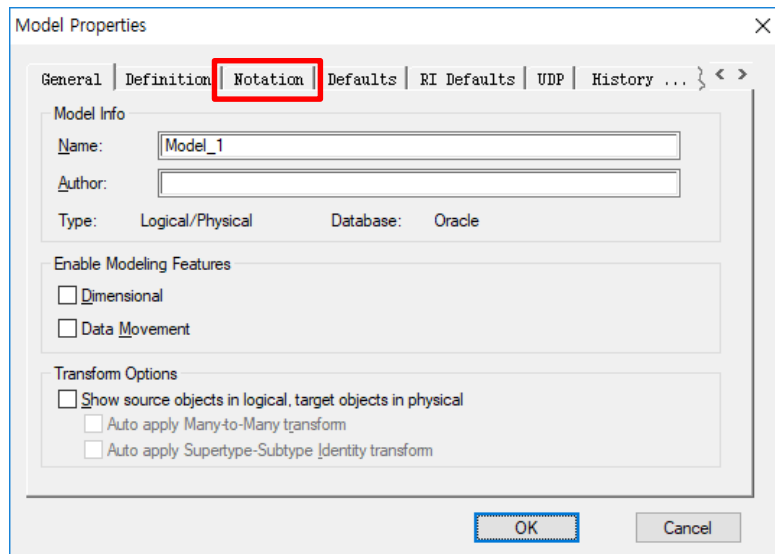


- ER-Win 표기 방식
 - 메인 화면이 열리면 어떤 표기방법을 사용할 것인지 선택해야 함
 - 두 가지 표기법 지원
 - ✓ **IE**(Information Engineering)
 - ✓ **IDEF1X**(Integration DEFinition for Information Modeling)

- IE 방식 설정 방법
 - Model → Model Properties



- IE 방식 설정 방법
 - Notation 탭 → Logical, Physical Notation을 IE로 설정



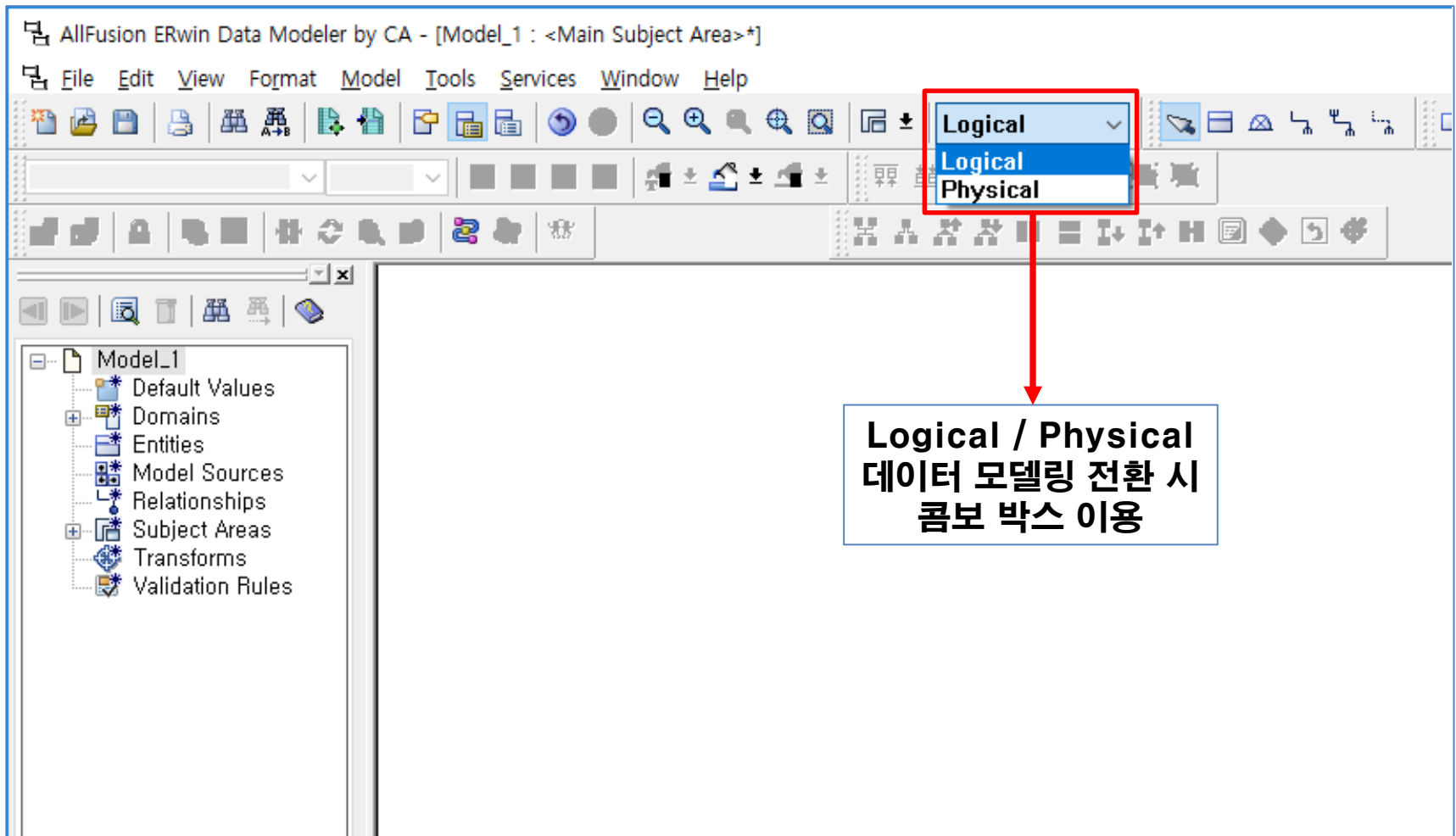
IDEF1X



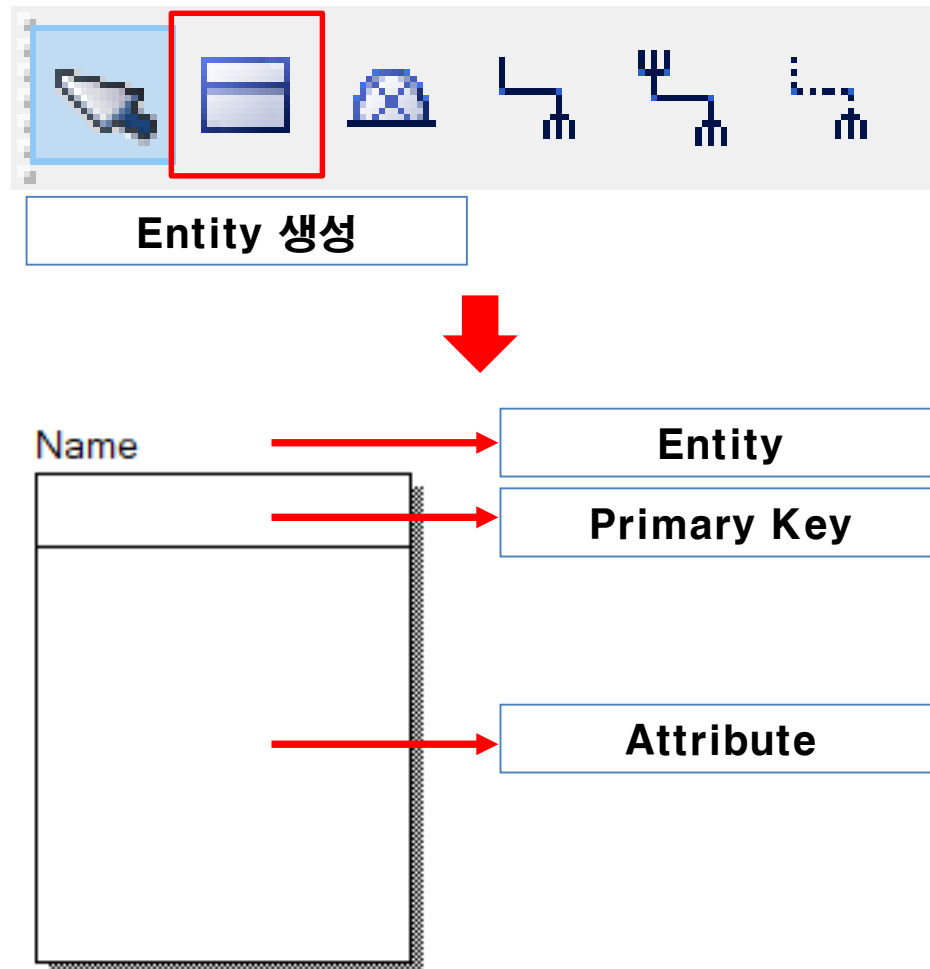
IE



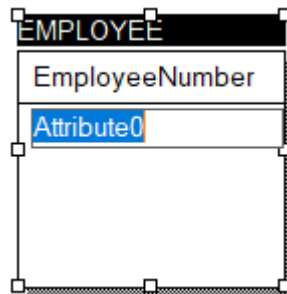
- Logical / Physical



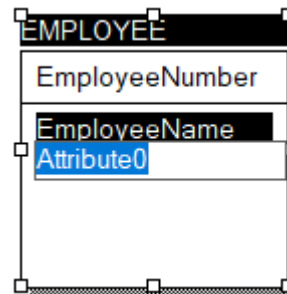
- Entity 생성



- Entity 생성
 - 예제) Employee Entity

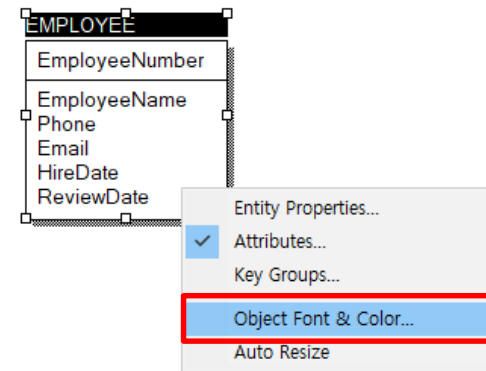
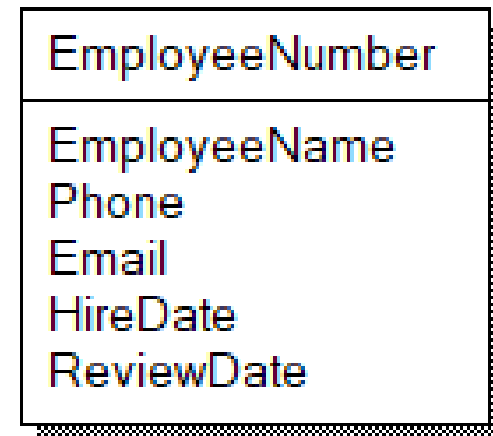


- 작성 후 **TAB** 키를 이용하여
다음으로 넘어갈 수 있음



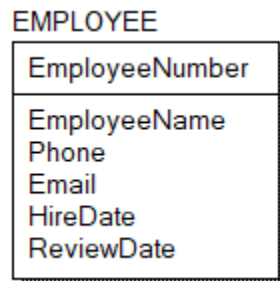
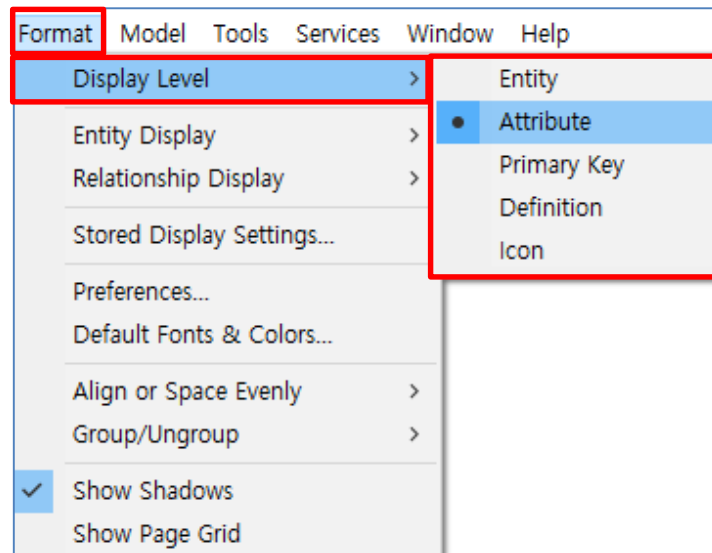
- 작성 후 **ENTER** 키를 이용하여
새로운 속성을 기술 할 수 있음

EMPLOYEE

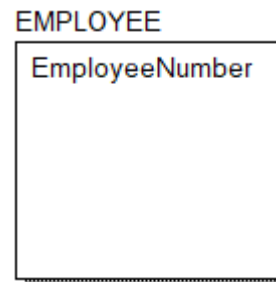


- Title Font 변경

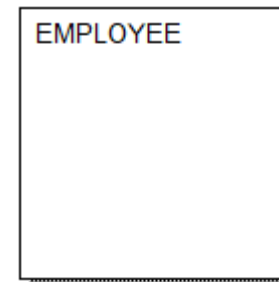
- Entity 속성 표현 방법
 - Format → Display Level → (선택)



Attribute 선택



Primary Key 선택



Entity 선택

모델링 : Identifying / Non Identifying Relationship 생성 (1/10)

15/40

- 관계 맺는 방법
 - 도구상자에서 관계선 선택
 - 부모 Entity 선택 후 자식 Entity 선택
 - 예제) COMPANY, DEPARTMENT, PHONE

COMPANY

CompanyName

City

DEPARTMENT

DepartmentName

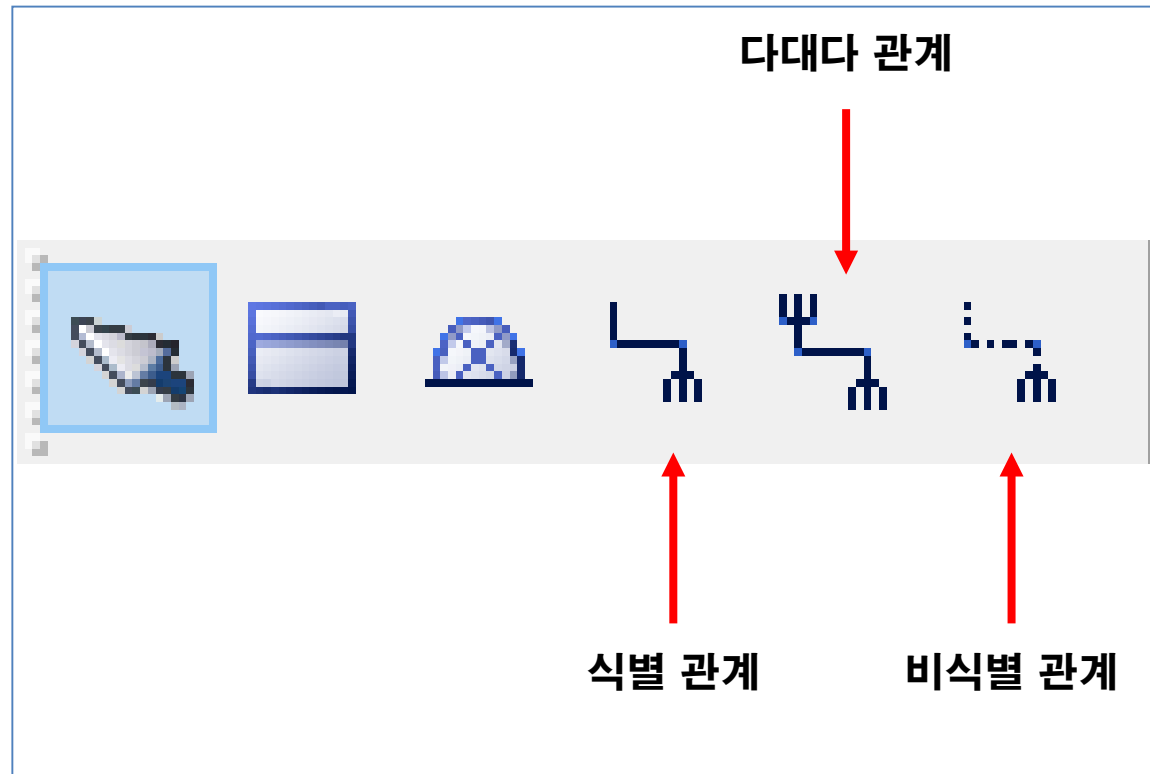
BudgetCode
MailShop

PHONE

PhoneNumber

모델링 : Identifying / Non Identifying Relationship 생성 (2/10)

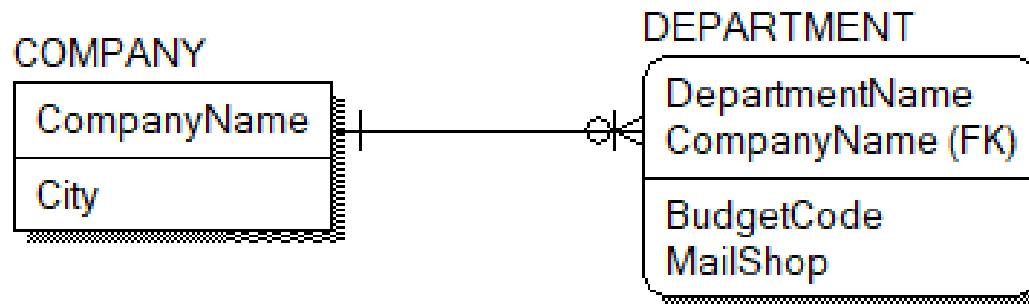
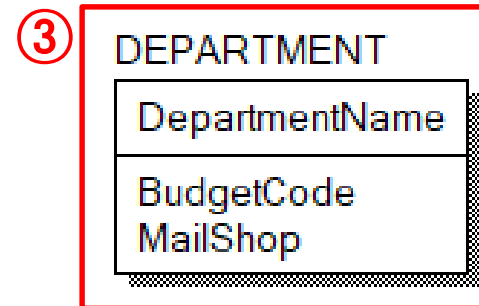
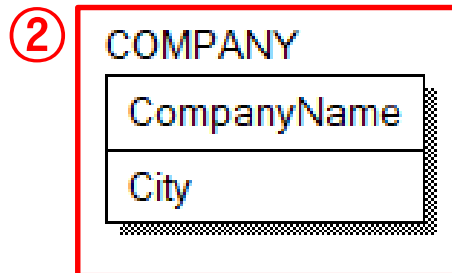
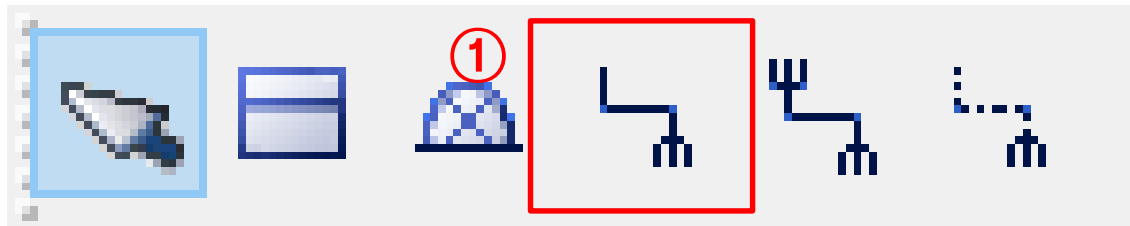
16/40



모델링 : Identifying / Non Identifying Relationship 생성 (3/10)

17/40

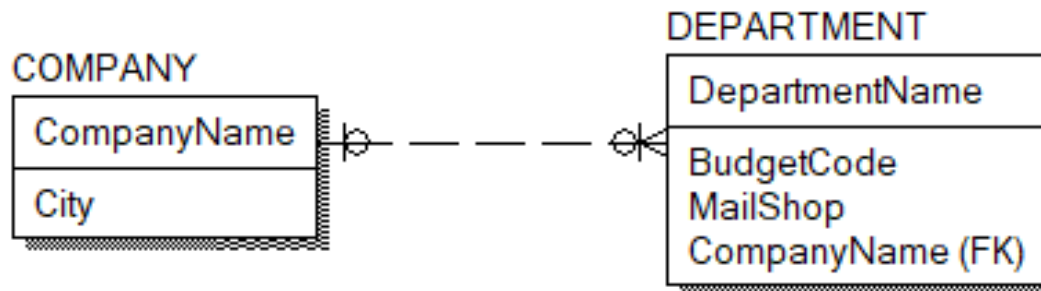
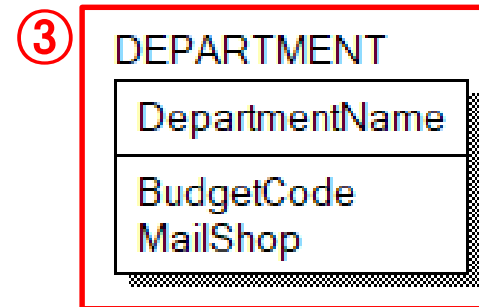
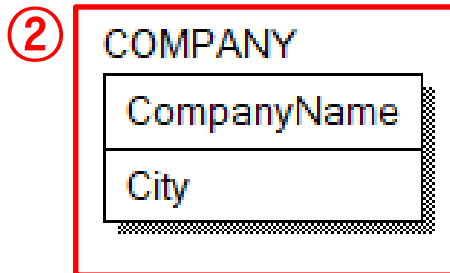
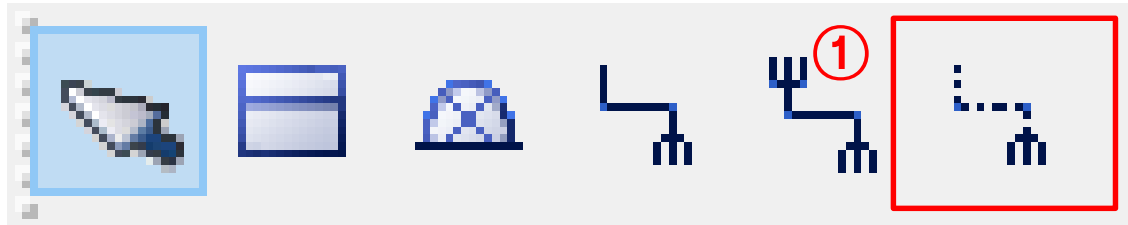
- 식별 관계



모델링 : Identifying / Non Identifying Relationship 생성 (4/10)

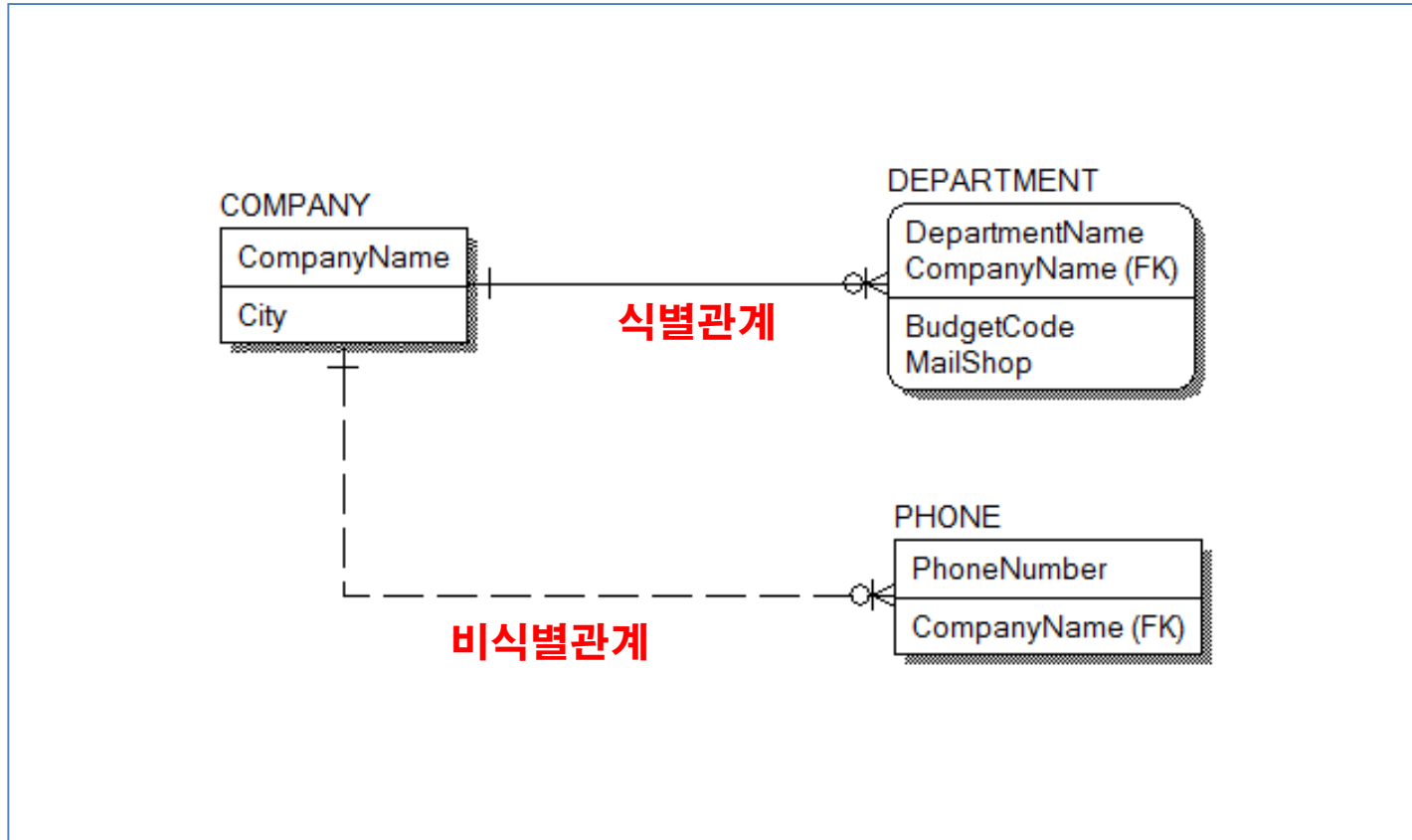
18/40

- 비식별 관계



모델링 : Identifying / Non Identifying Relationship 생성 (5/10)

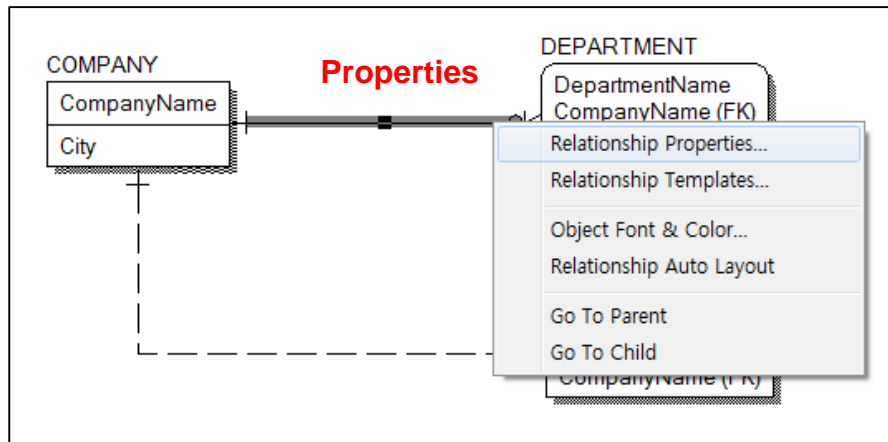
19/40



모델링 : Identifying / Non Identifying Relationship 생성 (6/10)

20/40

- 카디널리티 설정
 - 관계선 클릭 → 오른쪽 버튼 클릭 → Relationship Properties



Relationships

Relationship: COMPANY Chairs to DEPARTMENT

Name: R/8

General | Definition | Rolename | RI Actions | UDP

Verb Phrase

Parent-to-Child: Child-to-Parent:

Relationship Cardinality

Summary: One to Zero One or More

Cardinality

☒ Zero, One or More

☐ One or More (P)

☐ Zero or One (Z)

☐ Exactly:

Relationship Type

☒ Identifying

☐ Non-Identifying

Nulls

☐ Nulls Allowed

☐ No Nulls

☐ Logical Only

Reset Cardinality

OK Cancel

모델링 : Identifying / Non Identifying Relationship 생성 (7/10)

21/40

• 카디널리티

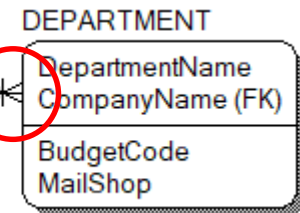
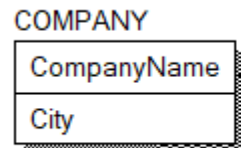
Cardinality

☒ Zero, One or More

☐ One or More (P)

☐ Zero or One (Z)

☐ Exactly:



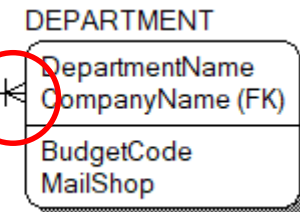
Cardinality

☐ Zero, One or More

☒ One or More (P)

☐ Zero or One (Z)

☐ Exactly:



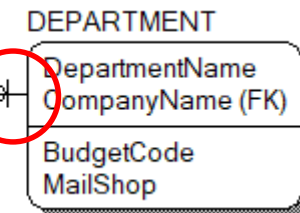
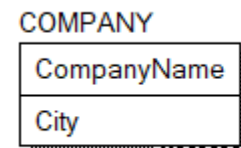
Cardinality

☐ Zero, One or More

☐ One or More (P)

☒ Zero or One (Z)

☐ Exactly:



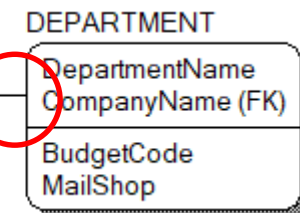
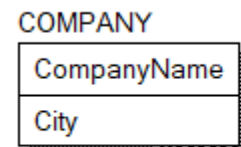
Cardinality

☐ Zero, One or More

☐ One or More (P)

☐ Zero or One (Z)

☒ Exactly:



모델링 : Identifying / Non Identifying Relationship 생성 (8/10)

22/40

- 관계 설명 작성
 - 관계선 클릭 → 오른쪽 버튼 클릭 → Relationship Properties
 - Format → Relationship Display → Verb Phrase

Relationships

Relationship: R/1 (COMPANY to DEPARTMENT)

Name: R/1

General | Definition | Rolename | RI Actions | UDP

Verb Phrase

Parent-to-Child: Composed

Child-to-Parent: Composed by

Relationship Cardinality

Summary: One-to-Zero-One-or-More

Cardinality

☒ Zero, One or More

☐ One or More (P)

☐ Zero or One (Z)

☐ Exactly:

Relationship Type

☒ Identifying

☐ Non-Identifying

Nulls

☐ Nulls Allowed

☐ No Nulls

☐ Logical Only

Reset Cardinality

OK Cancel

Format | Model | Tools | Services | Window | Help

Display Level

Entity Display

Relationship Display

Stored Display Settings...

Preferences...

Default Fonts & Colors...

Align or Space Evenly

Group/Ungroup

Show Shadows

Show Page Grid

Logical

Verb Phrase

Cardinality

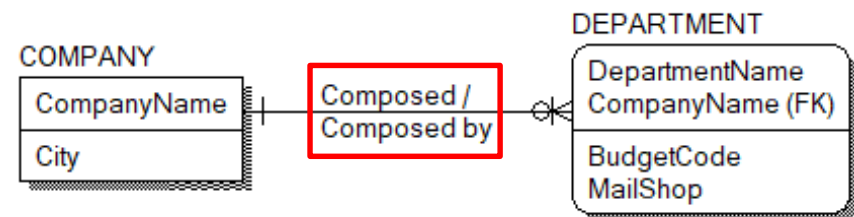
Referential Integrity

☒ Subtype Discriminator

Show Dangling Relationships

☒ Orthogonal Lines

Diagonal Lines



모델링 : Identifying / Non Identifying Relationship 생성 (9/10)

23/40

- 관계 옵션 설정
 - 관계선 클릭 → 오른쪽 버튼 클릭 → Relationship Properties

Relationships

Relationship: COMPANY Composed DEPARTMENT

Name: R/1

New... Delete

General | Definition | Rolename | RI Actions | UDP

Verb Phrase

Parent-to-Child: Composed

Child-to-Parent: Composed by

Relationship Cardinality

Summary: Zero-or-One-to-Zero-One-or-More

Cardinality

☒ Zero, One or More

☐ One or More (P)

☐ Zero or One (Z)

☐ Exactly:

Relationship Type

☐ Identifying

☒ Non-Identifying

Nulls

☒ Nulls Allowed

☐ No Nulls

☐ Logical Only

Reset Cardinality

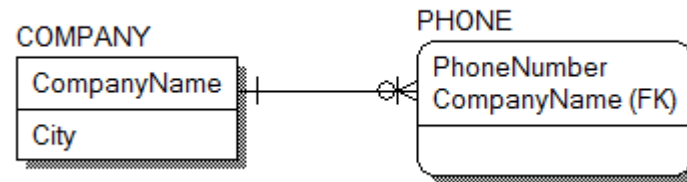
OK Cancel

모델링 : Identifying / Non Identifying Relationship 생성 (10/10)

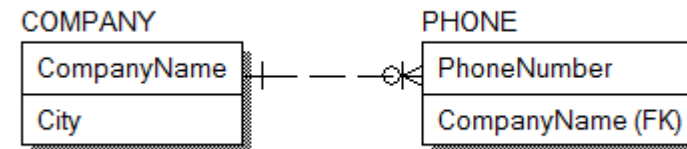
24/40

- Relationship Type

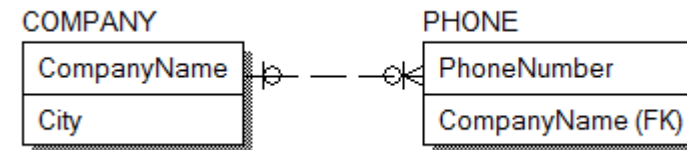
- ☒ Identifying
☐ Non-Identifying



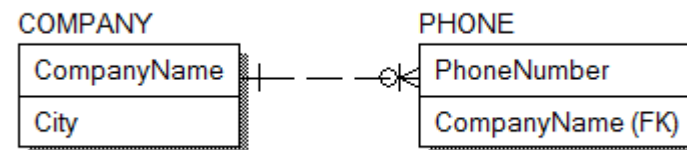
- ☐ Identifying
☒ Non-Identifying



- Nulls
☒ Nulls Allowed
☐ No Nulls



- Nulls
☐ Nulls Allowed
☒ No Nulls



모델링 : Many-to-Many Relationship (1/5) 25/40

Many - To - Many Relationship (N:M 관계)

- Logical에서 존재

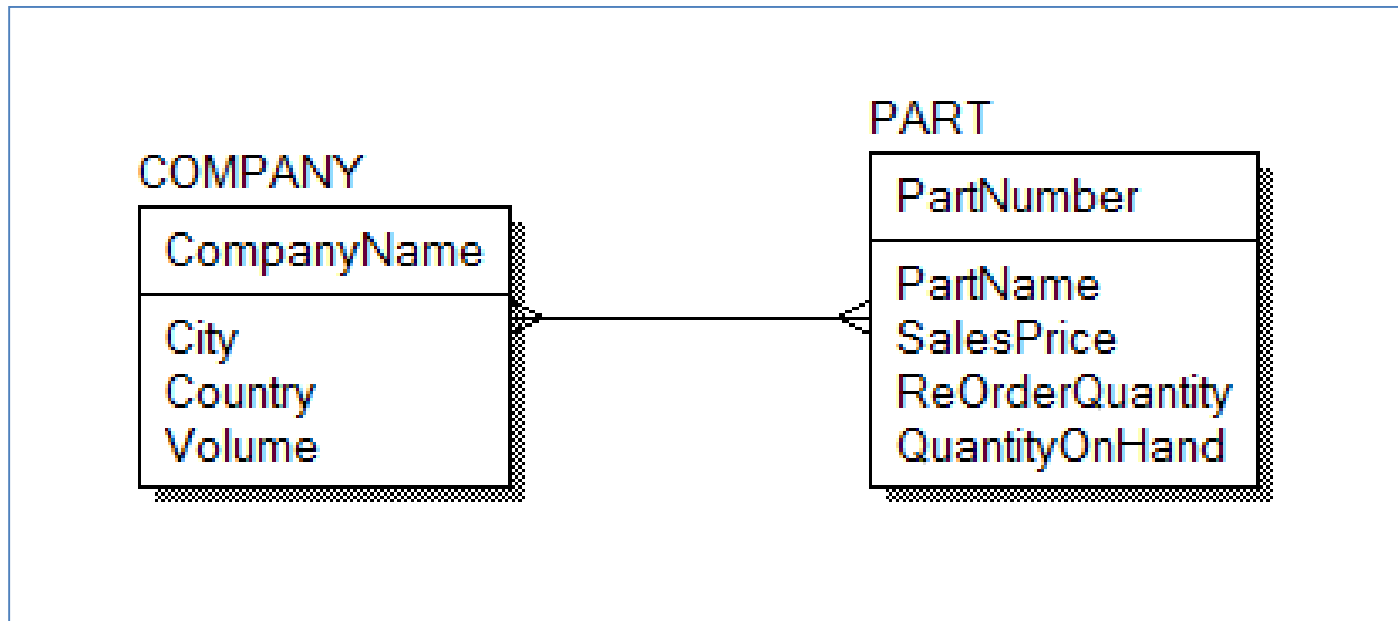


다대다 관계

모델링 : Many-to-Many Relationship (2/5) 26/40

Many - To - Many Relationship (N:M 관계)

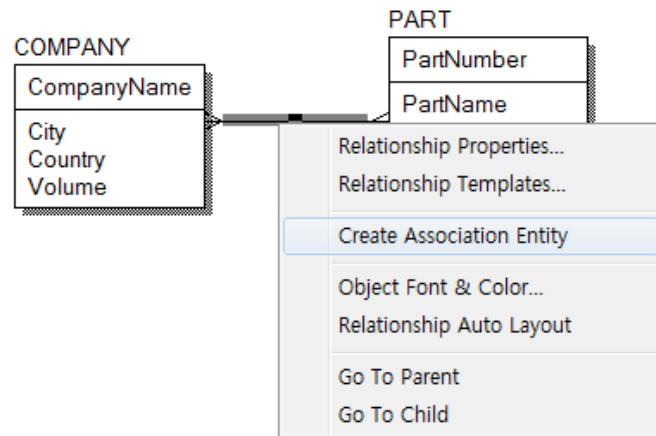
- Entity를 생성한 후 순서에 관계 없이 두 Entity를 차례대로 선택



모델링 : Many-to-Many Relationship (3/5) 27/40

Many - To - Many Relationship (N:M 관계)

- 관계를 해소하는 방법



- 관계 선택
→ 마우스 오른쪽 버튼
→ Create Association Entity



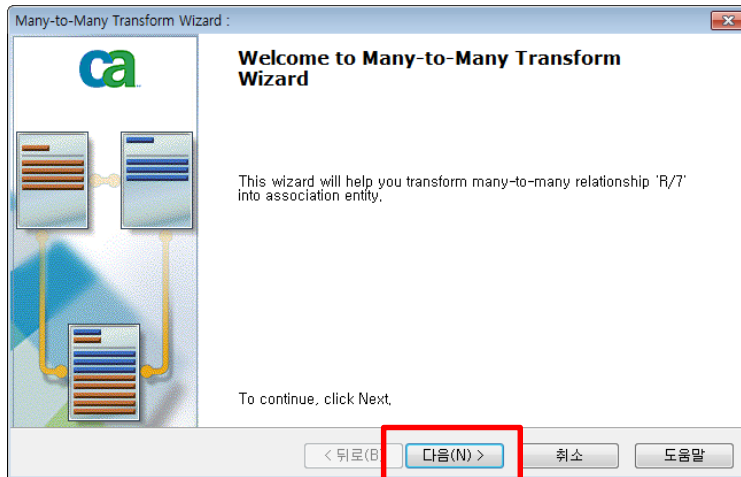
- 관계 선택
→ 'ERwin Transform Toolbar' 에서
'Many to Many Transform' 선택

모델링 : Many-to-Many Relationship (4/5) 28/40

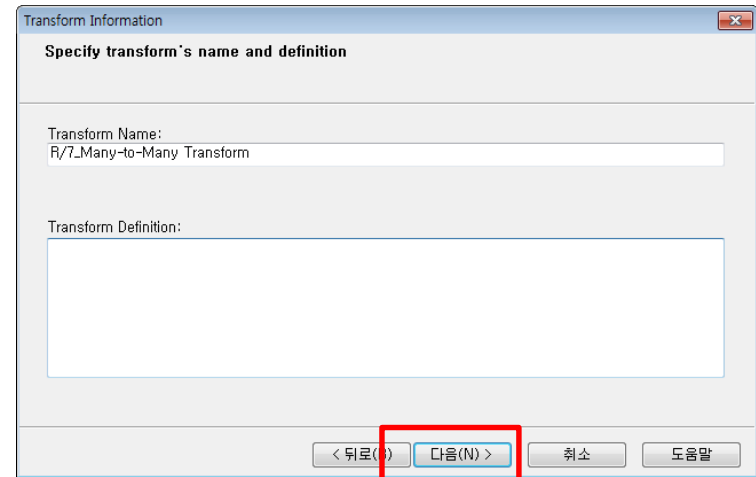
Many - To - Many Relationship (N:M 관계)

- 관계를 해소하는 방법

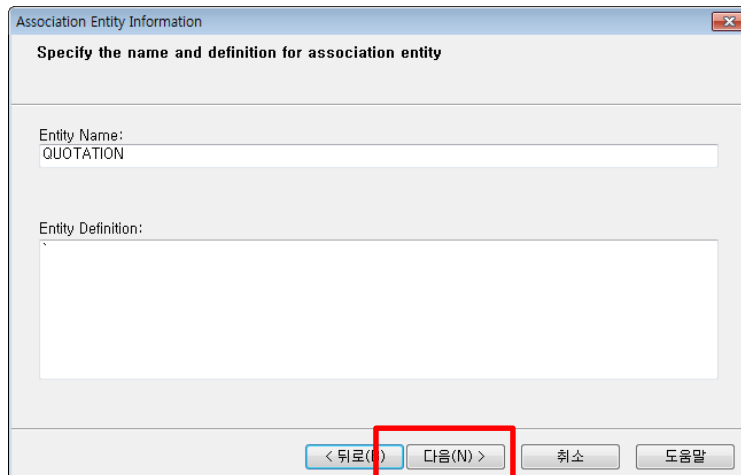
①



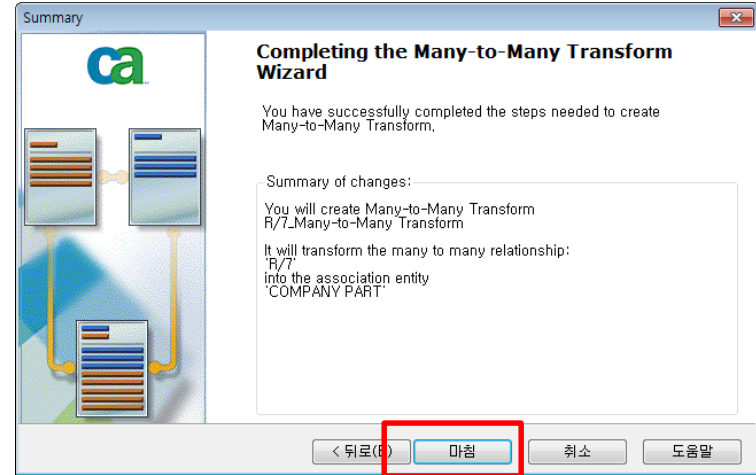
②



③



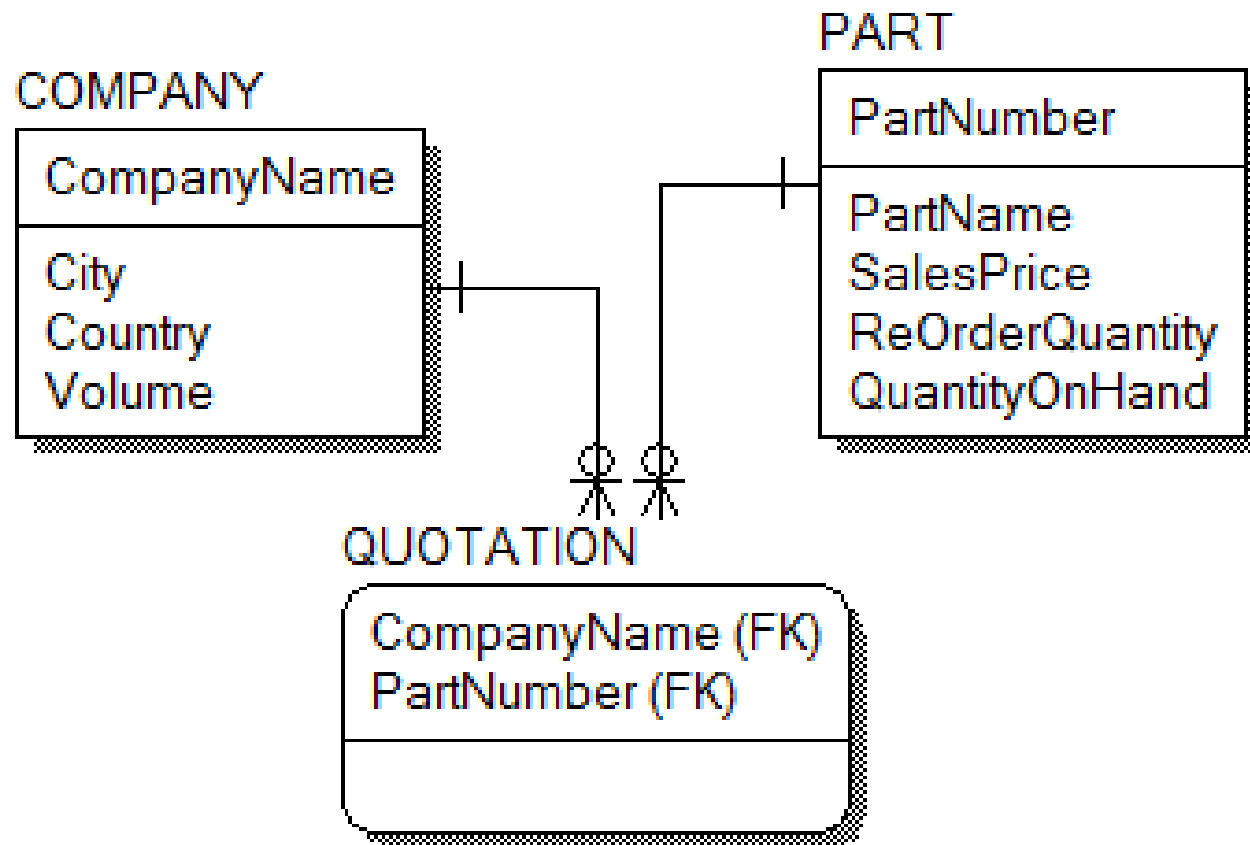
④



모델링 : Many-to-Many Relationship (5/5) 29/40

Many - To - Many Relationship (N:M 관계)

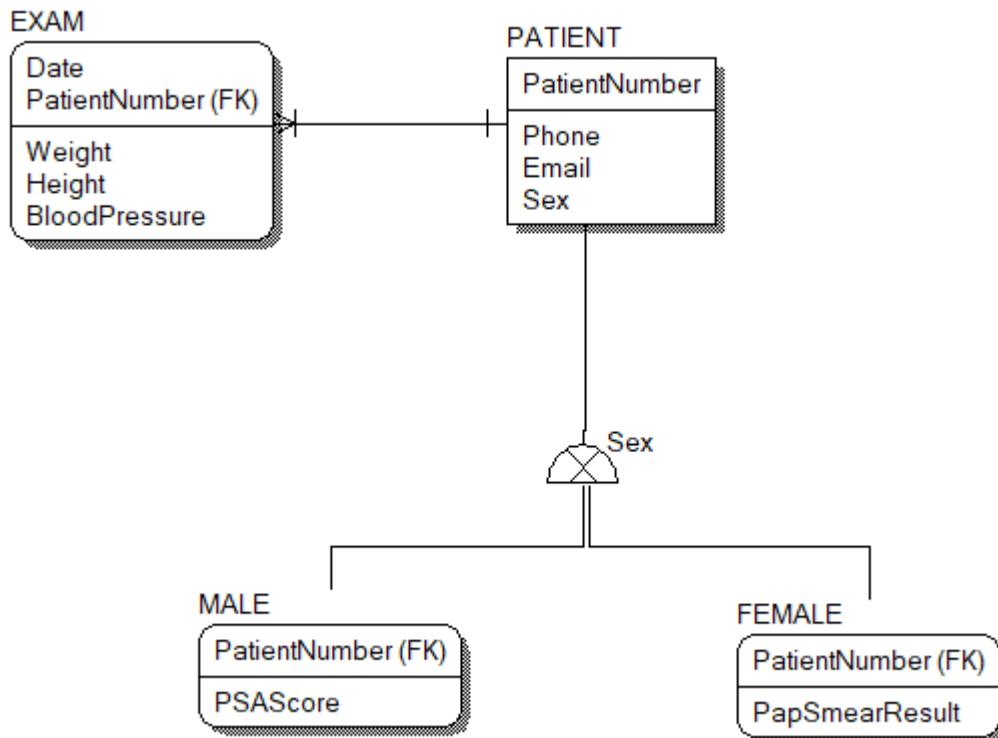
- 관계 해소 예제



Subtypes : Exclusive or Inclusive (1/2) 30/40

Exclusive

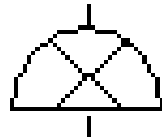
- 오른쪽 클릭 → Subtype Properties



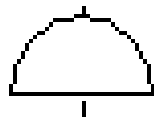
Subtype Properties dialog box:

- Supertype: PATIENT
- Subtypes: MALE, FEMALE
- Type: ☒ Exclusive ☐ Inclusive
- Discriminator:
 - ☒ PATIENT
 - ☐ PatientNumber
 - ☐ Phone
 - ☐ Email
 - ☒ Sex

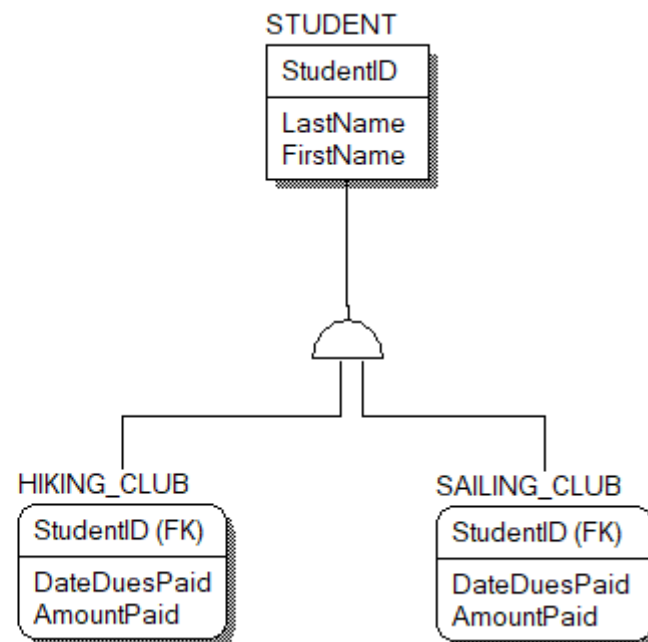
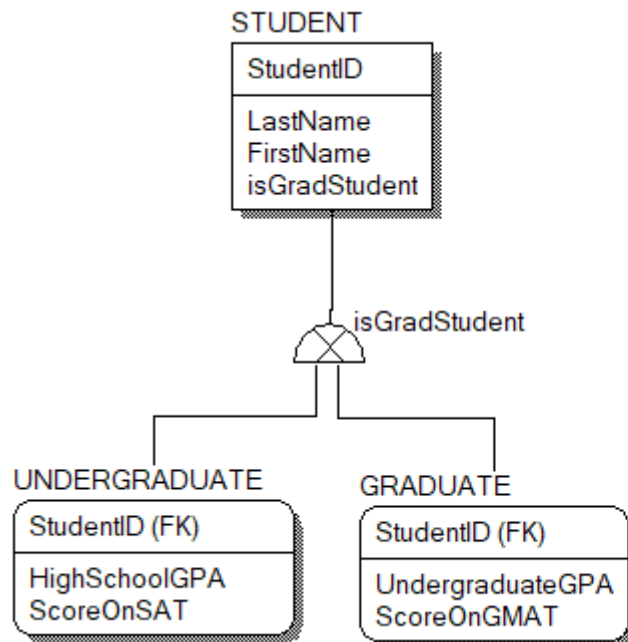
Subtypes : Exclusive or Inclusive (2/2) 31/40



■ Exclusive TYPE



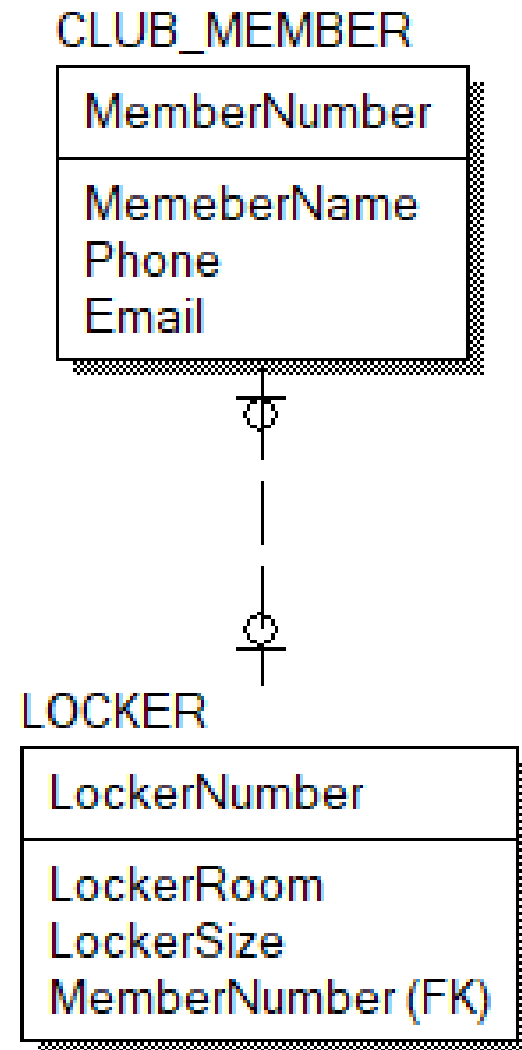
■ Inclusive TYPE



Strong Entity Patterns (1/3):

1:1 Strong Entity Relationships

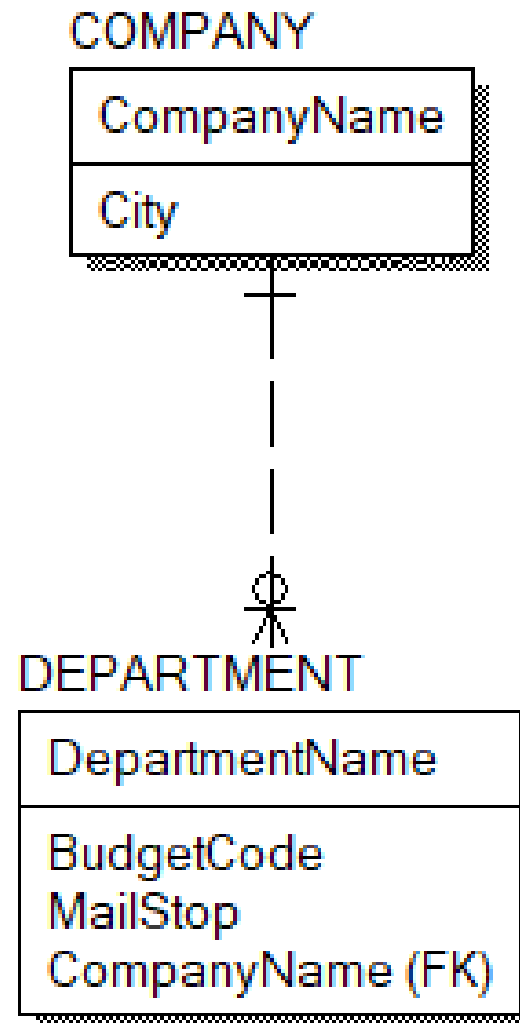
32/40



Strong Entity Patterns (2/3):

1:N Strong Entity Relationships

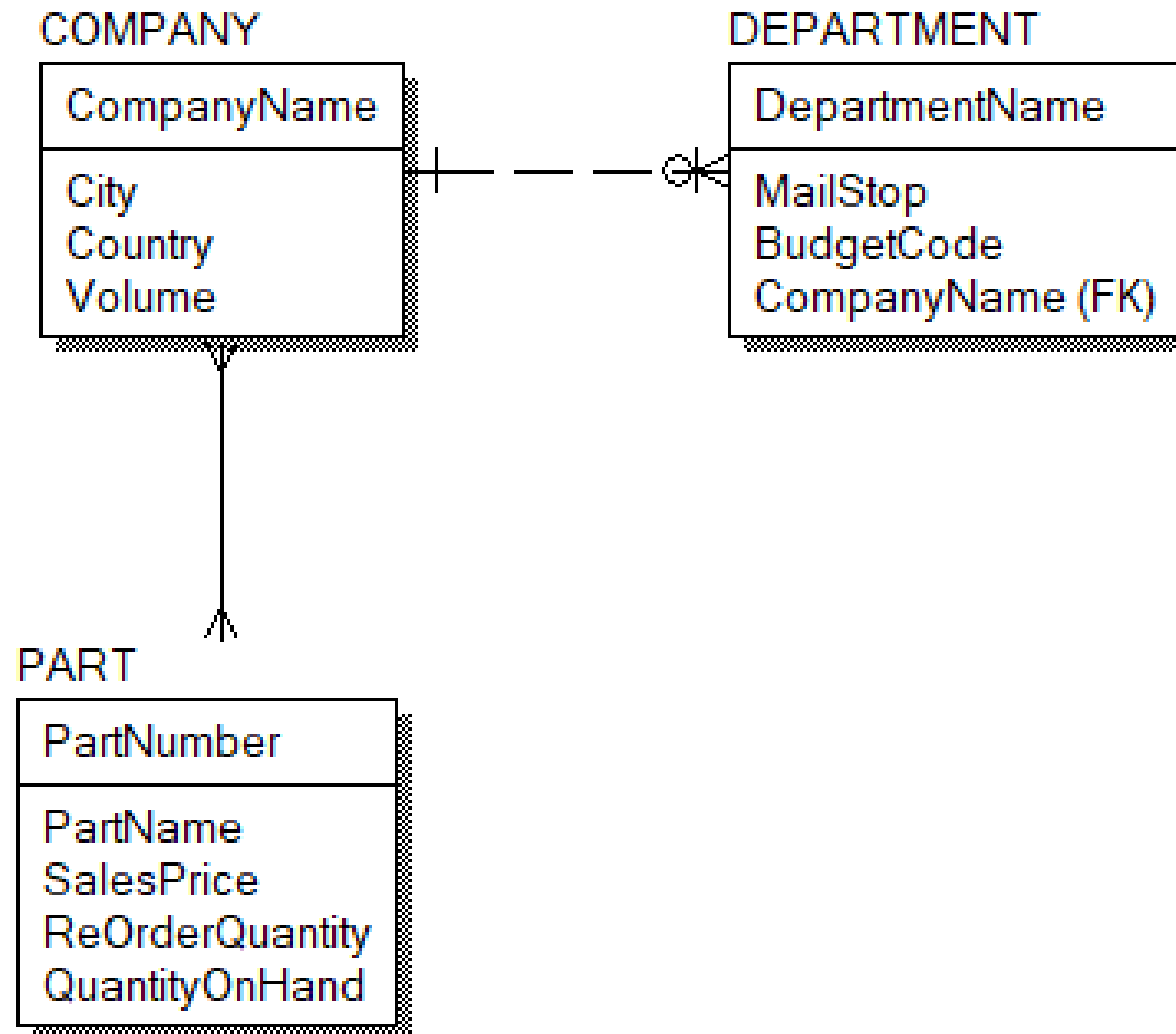
33/40



Strong Entity Patterns (3/3):

N:M Strong Entity Relationships

34/40



Q1) ER-Win 프로그램을 사용하여 아래와 같은 동일한 데이터베이스 모델을 작성하시오.

EMP

Empno
Ename
Job
MGR
Hiredate
Sal
Comm

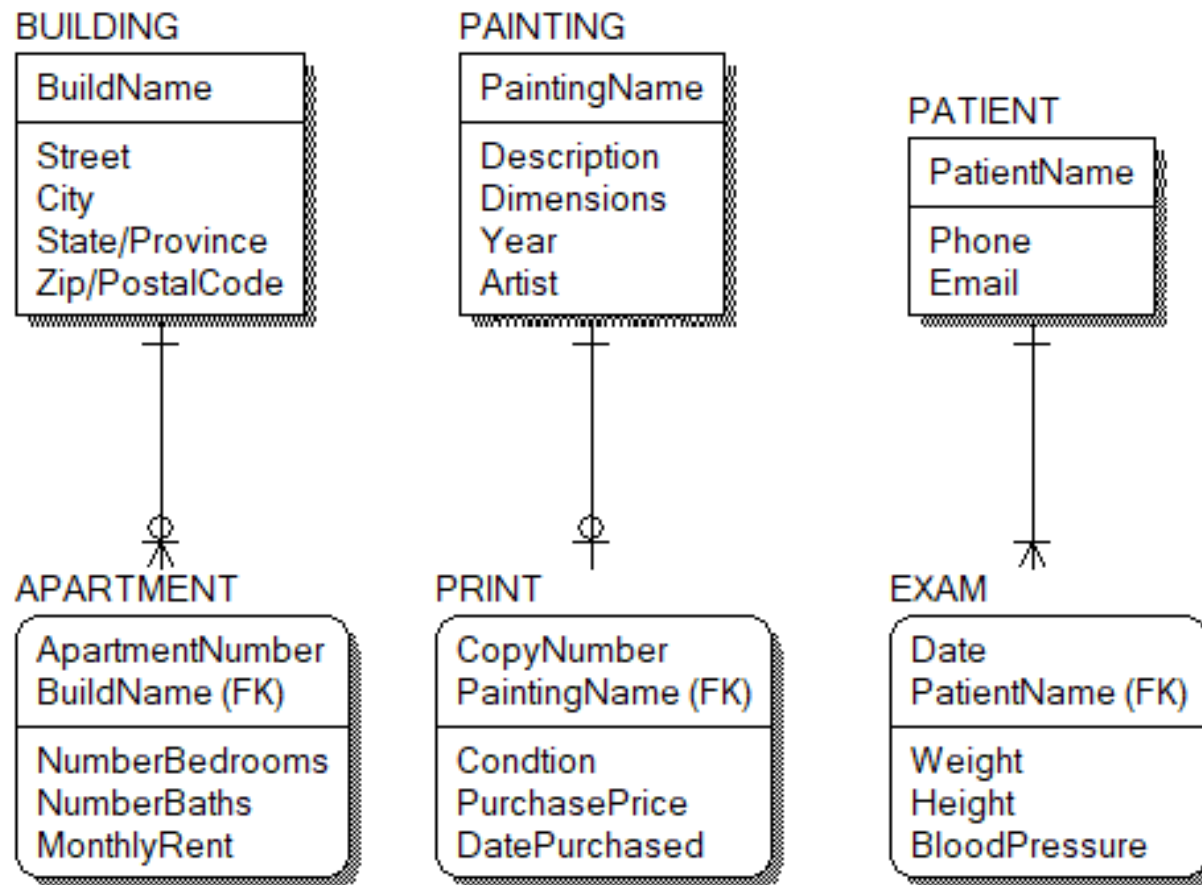
DEPT

Deptno
Dname
Loc

CUSTOMER

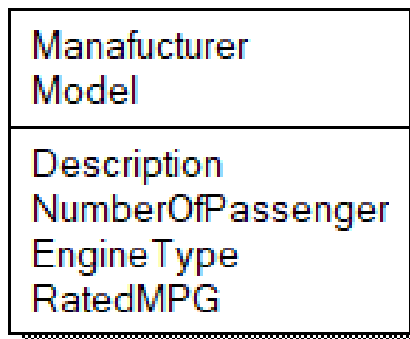
CID
Password
CName
Mail
PhoneNumber
JoinDate

Q2) ER-Win 프로그램을 사용하여 아래와 같은 동일한 데이터베이스 모델을 작성하시오.

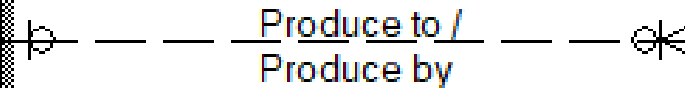
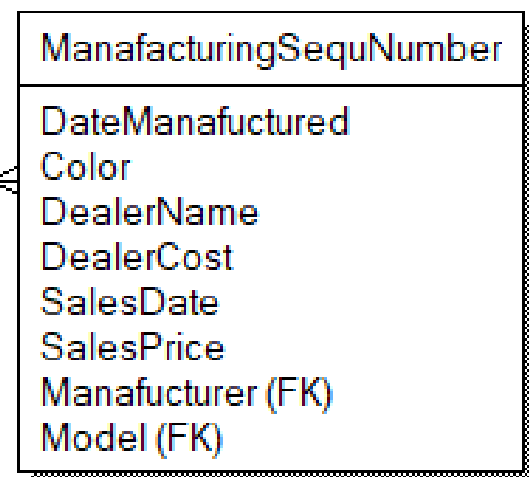


Q3) ER-Win 프로그램을 사용하여 아래와 같은 동일한 데이터베이스 모델을 작성하시오.

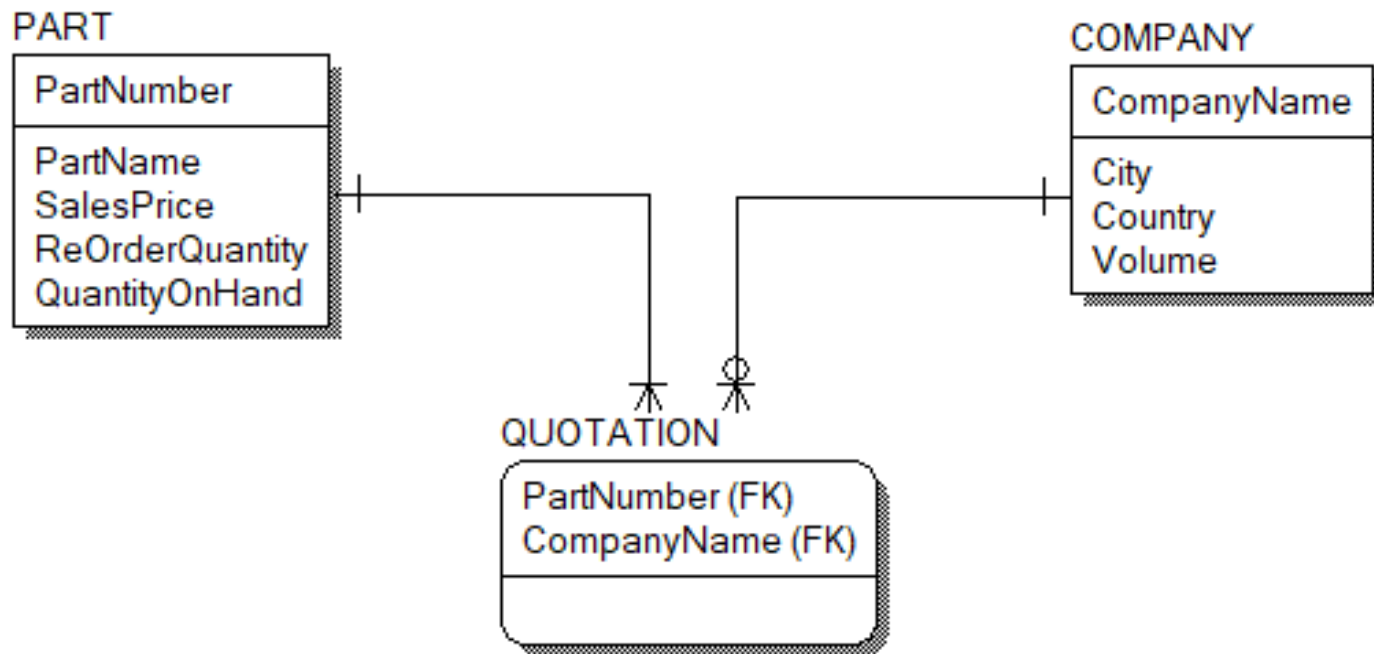
AUTO_MODEL



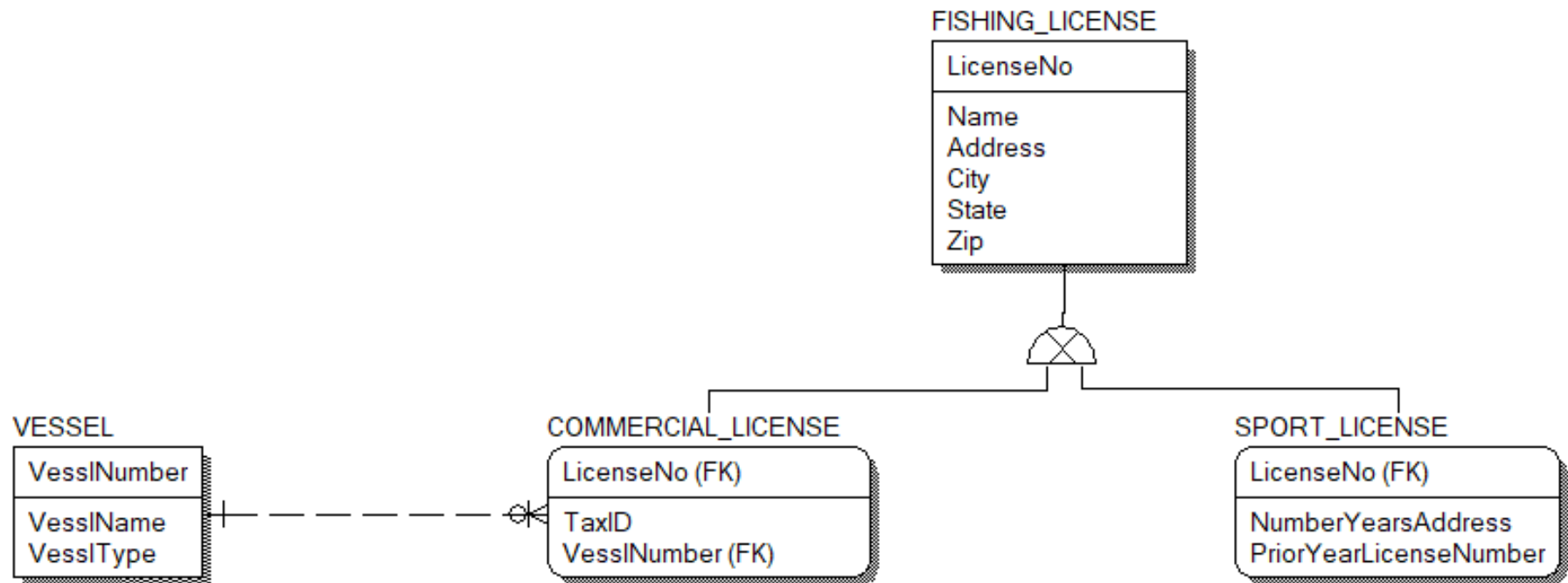
VEHICLE



Q4) 아래와 같은 모델을 작성하시오.



Q5) 아래와 같은 모델을 작성하시오.



- 제출 방식 : E-Class를 통하여 제출
- 제출 내용 : ERwin File
- 제출 형식 : 학번_이름_주차
 - Ex) 학번_홍길동_3주차.erwin
- 제출 기한 : 수업 시작 시간으로 부터 24시간 이내 제출
 - 제출 기한 위반 시 감점 기준
 - 지각 제출 시 과제 점수에서 40% 감점
 - 1일 초과 당 20% 추가 감점 (단, 4일 이후 제출 불가)