

〈4주차 실습〉

ER-Win(1)

Database Programming

- ER-Win 설치
- ER-Win 실행
- Entity 생성
- 식별/비식별 관계
- 다대다 관계
- 실습

ERwin Data Modeler

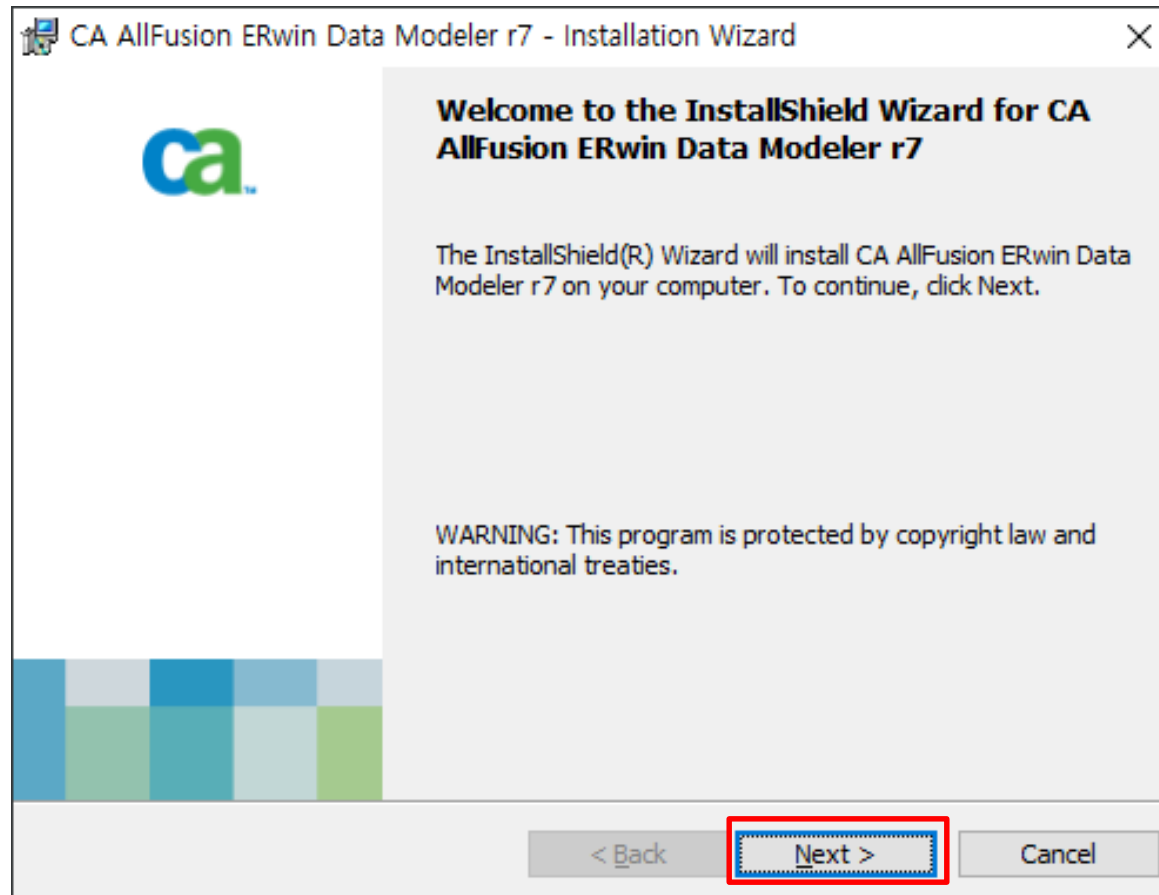
1. 사용하기 쉽고 강력한 기능을 지닌 데이터 모델링 도구로서 데이터베이스를 빠르고 쉽게 설계할 수 있도록 지원

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

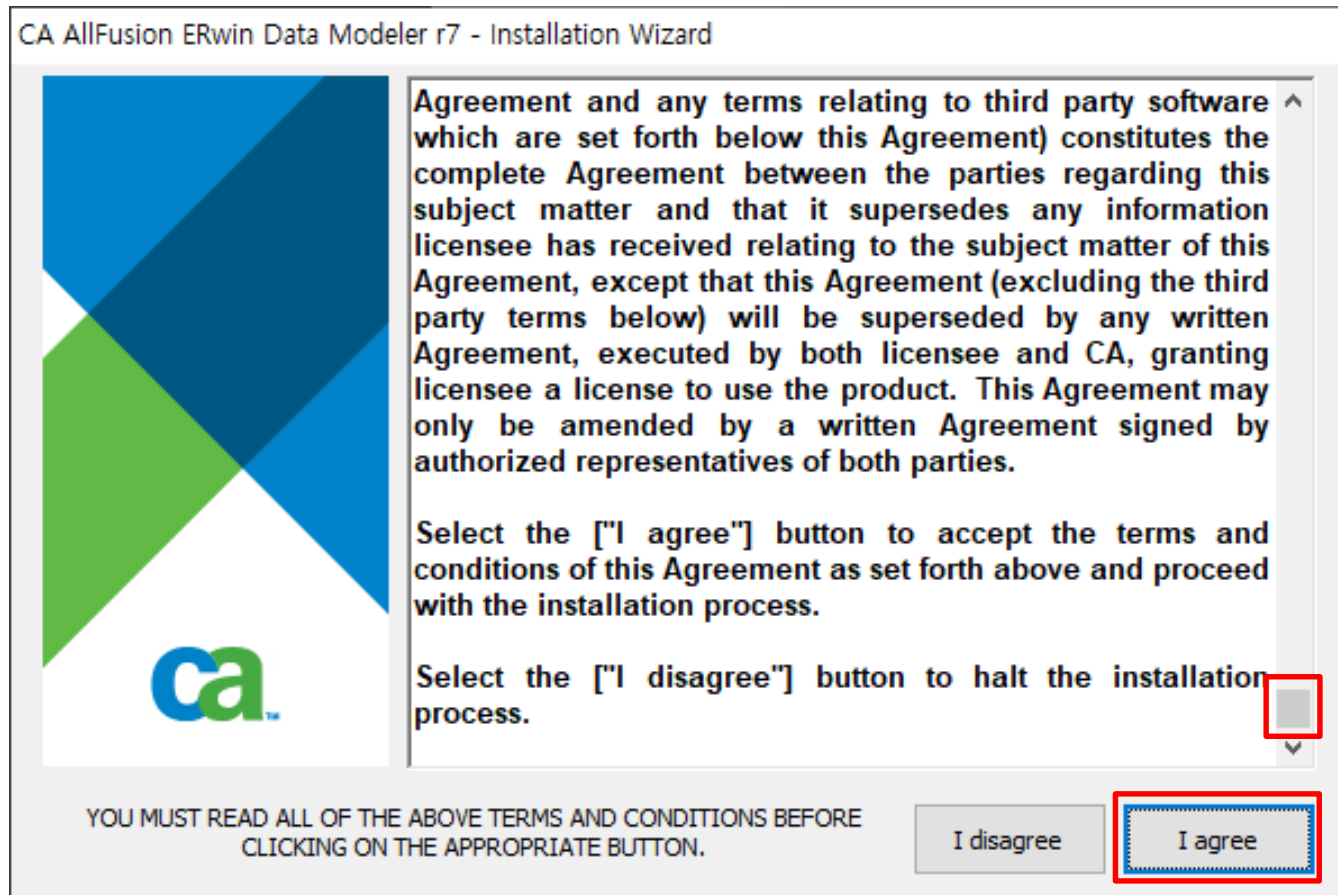
(CASE Tool : Computer Added Software Engineering)

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

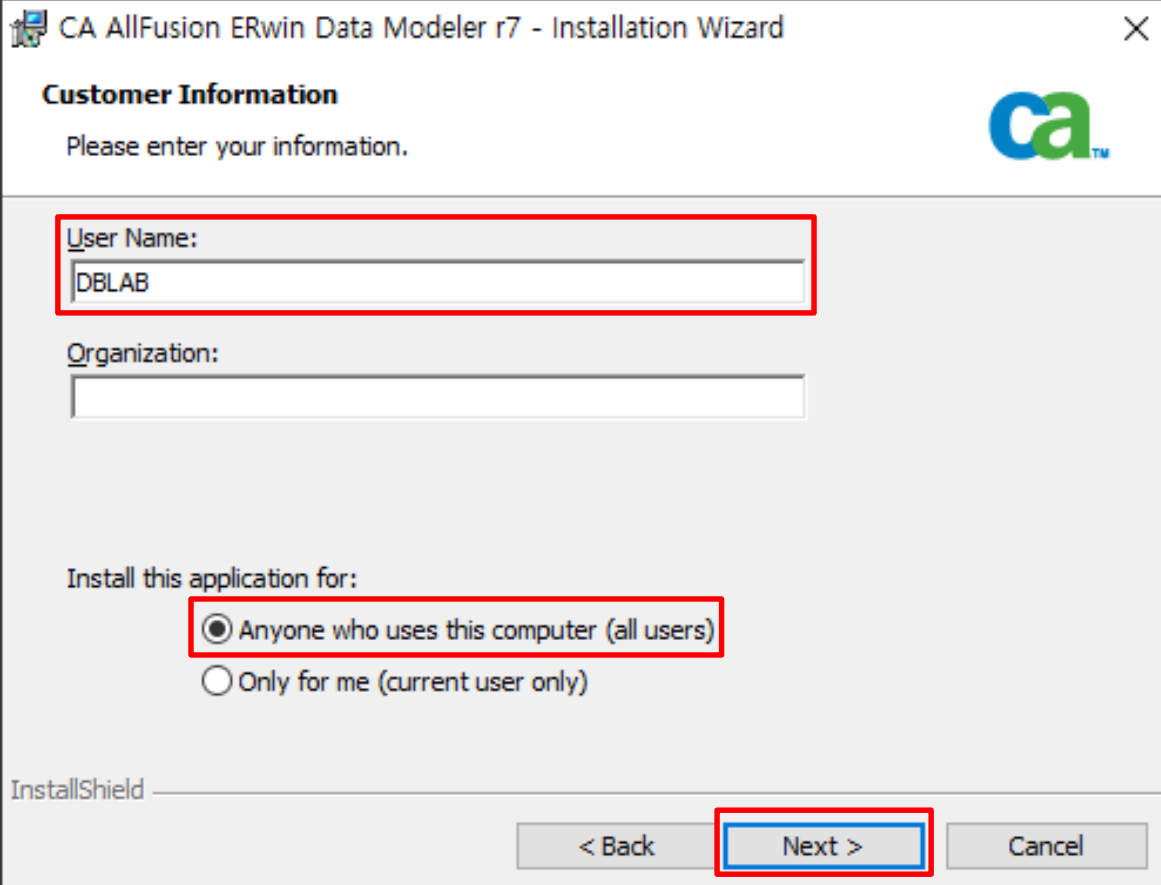
- ERwin7.2.zip 압축 해제 → ERwin7.2.exe 실행 → Next 클릭



- 스크롤을 맨 밑으로 내린 후, I agree 클릭



- User Name 입력 → Install this application for 선택 확인
→ Next 클릭



The image shows a screenshot of the 'CA AllFusion ERwin Data Modeler r7 - Installation Wizard' window. The window has a title bar with the application name and a close button. Below the title bar, the text 'Customer Information' is displayed, followed by the instruction 'Please enter your information.' and the CA logo. There are two text input fields: 'User Name:' with the value 'DBLAB' entered, and 'Organization:' which is empty. Below these fields, the text 'Install this application for:' is followed by two radio button options: 'Anyone who uses this computer (all users)' (which is selected) and 'Only for me (current user only)'. At the bottom of the window, there are three buttons: '< Back', 'Next >', and 'Cancel'. The 'Next >' button is highlighted with a red border.

CA AllFusion ERwin Data Modeler r7 - Installation Wizard

Customer Information

Please enter your information.

User Name:
DBLAB

Organization:

Install this application for:

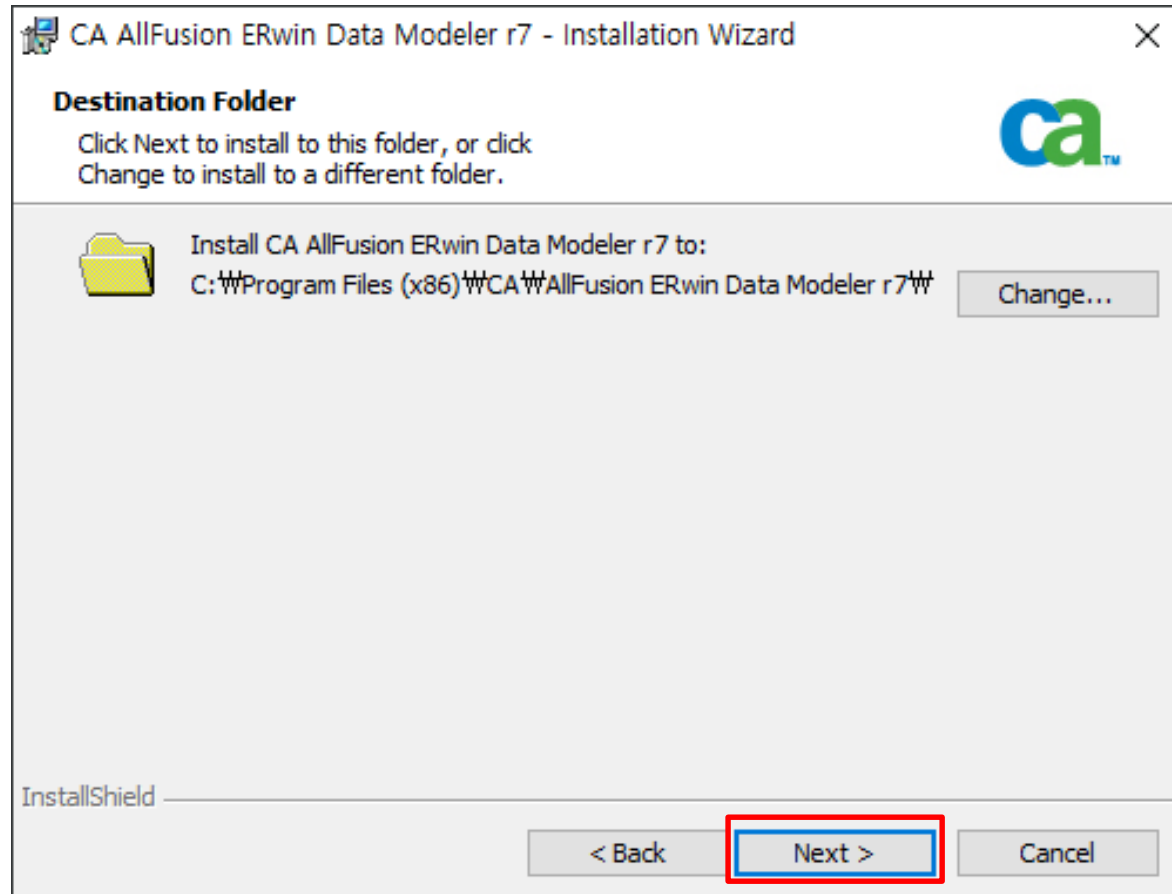
☒ Anyone who uses this computer (all users)

☐ Only for me (current user only)

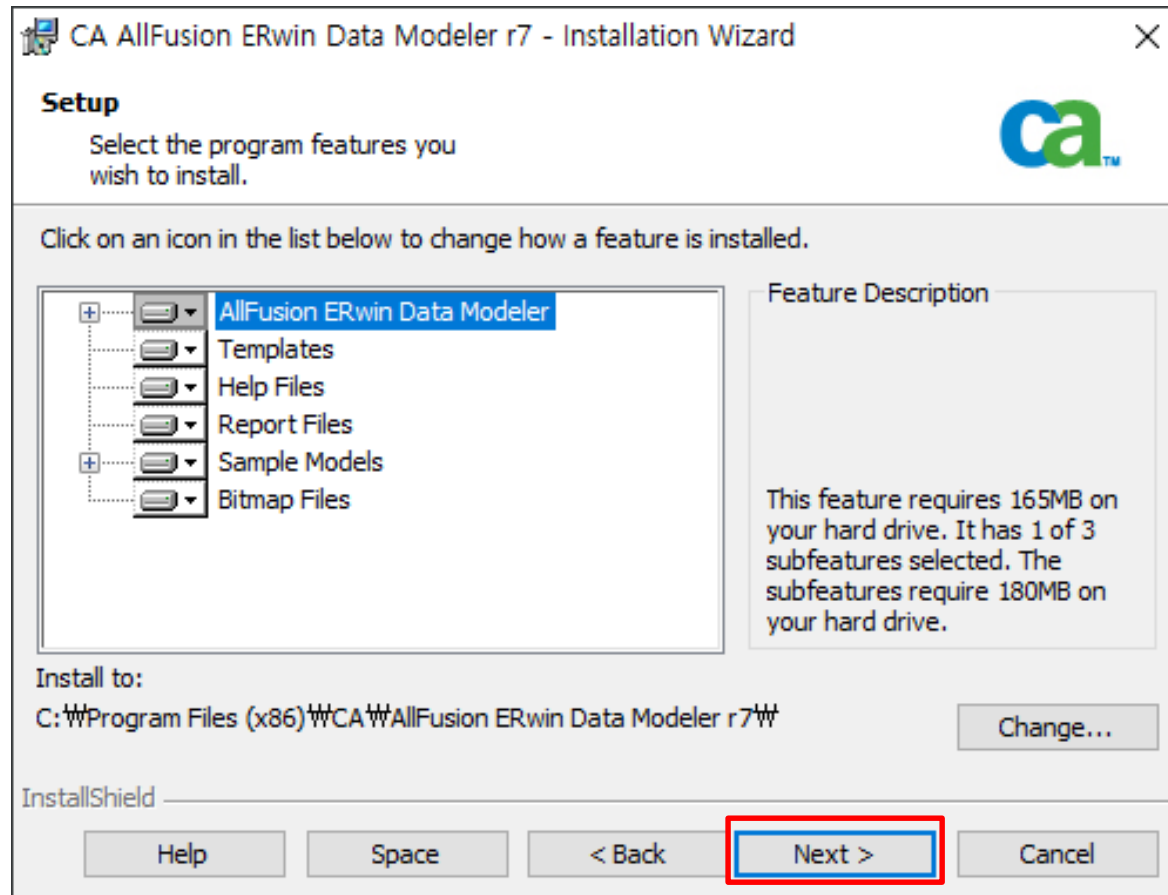
InstallShield

< Back Next > Cancel

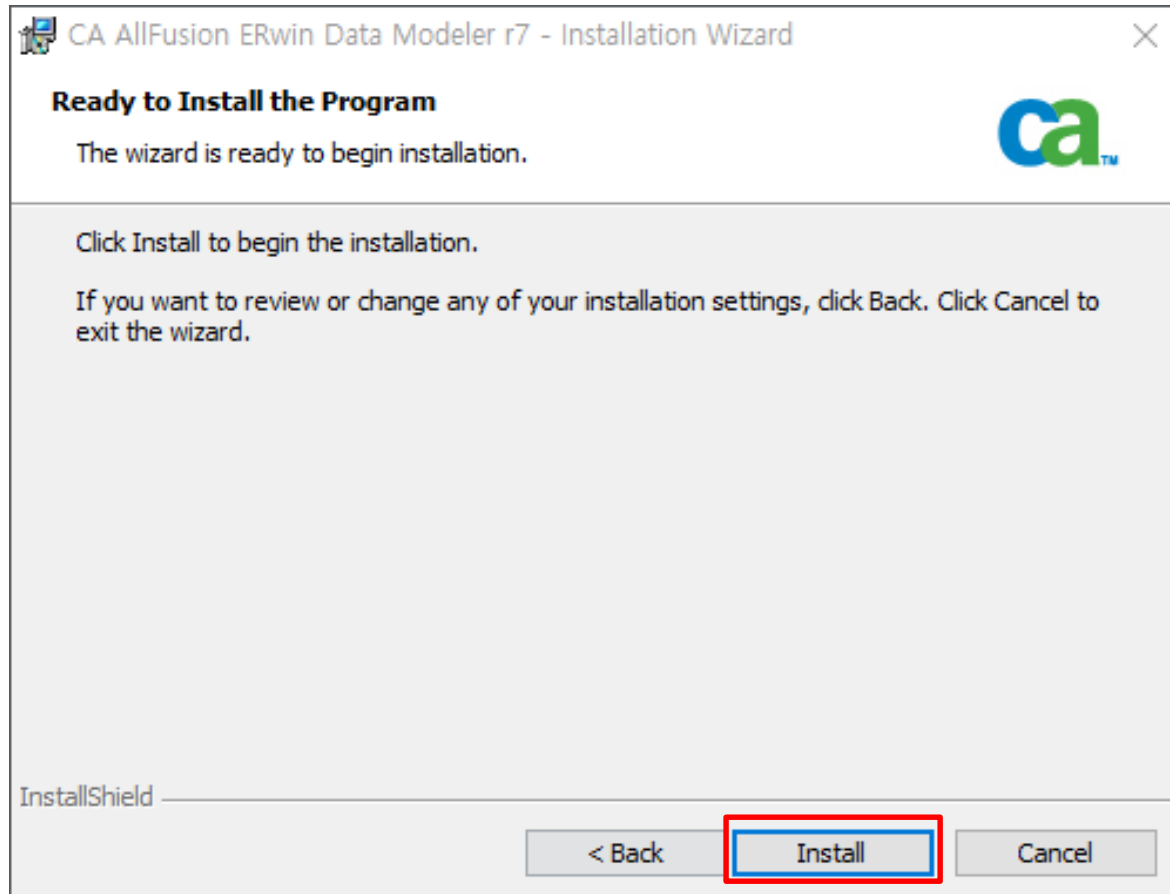
- 설치 경로 확인 후, Next 클릭



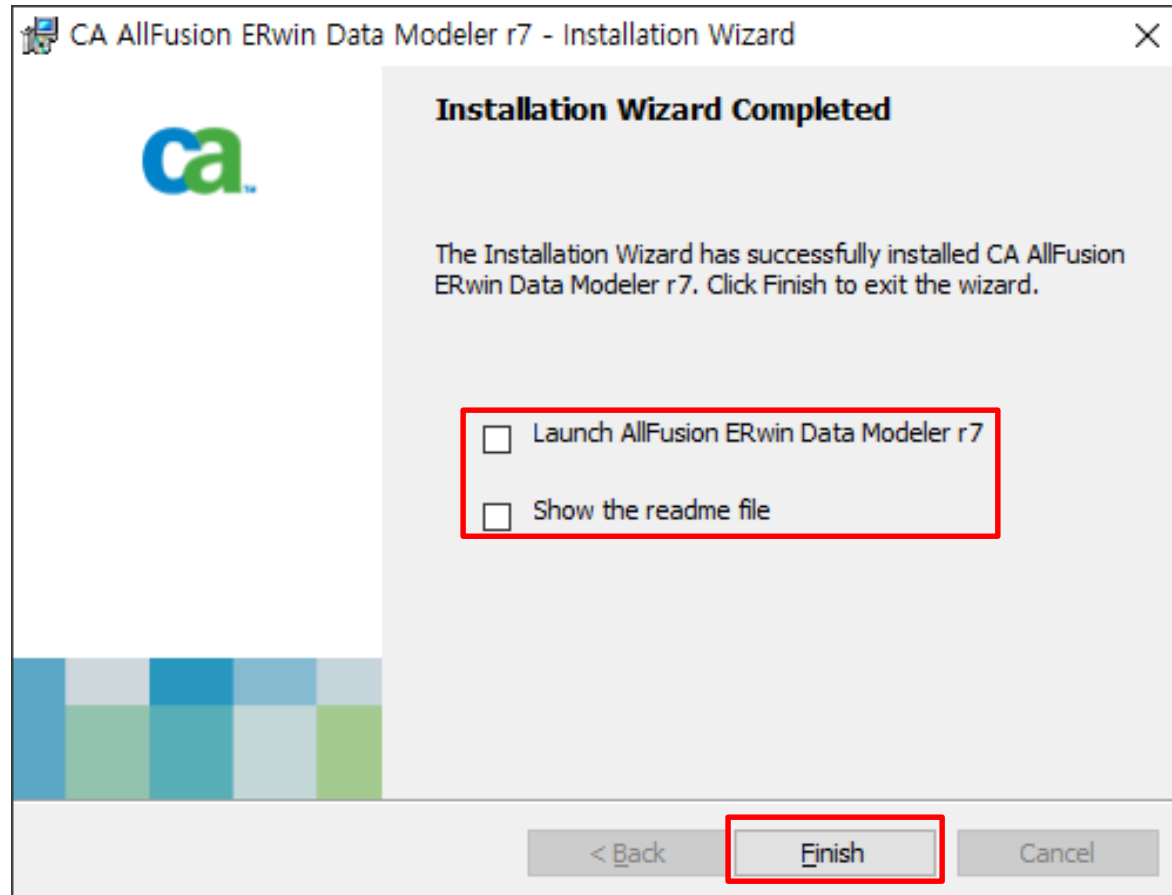
- Next 클릭



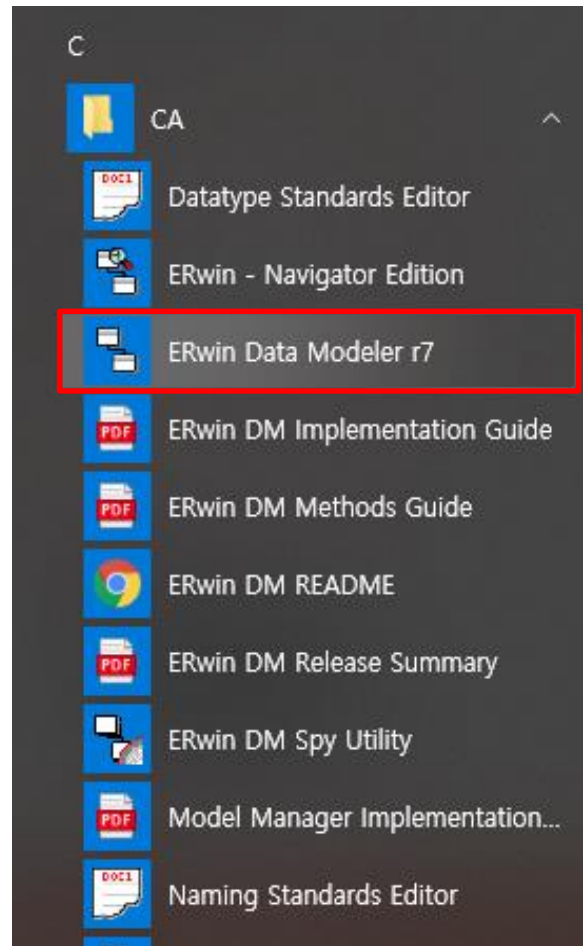
- Install 클릭



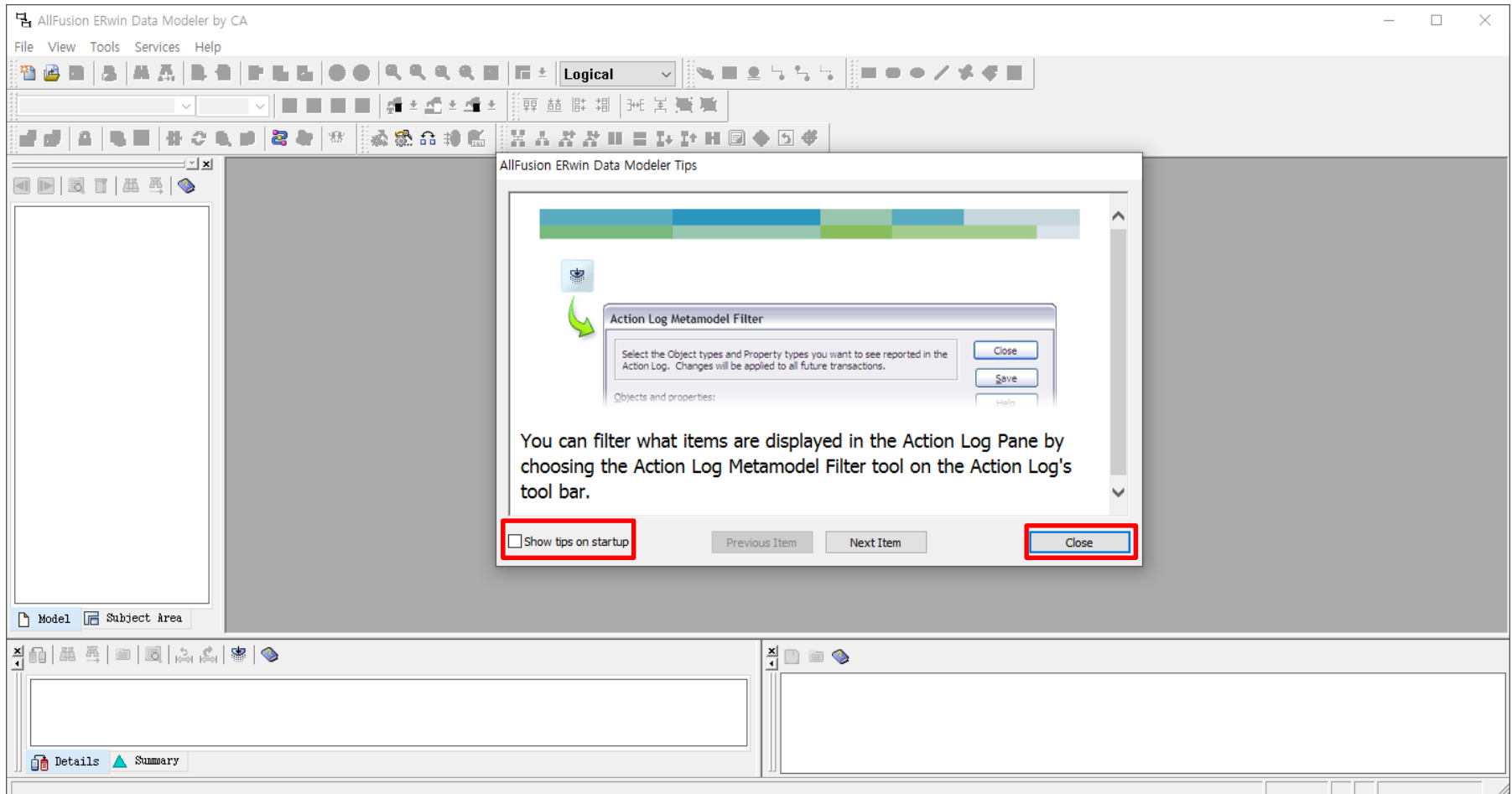
- 선택 항목 체크 해제 → Finish 클릭



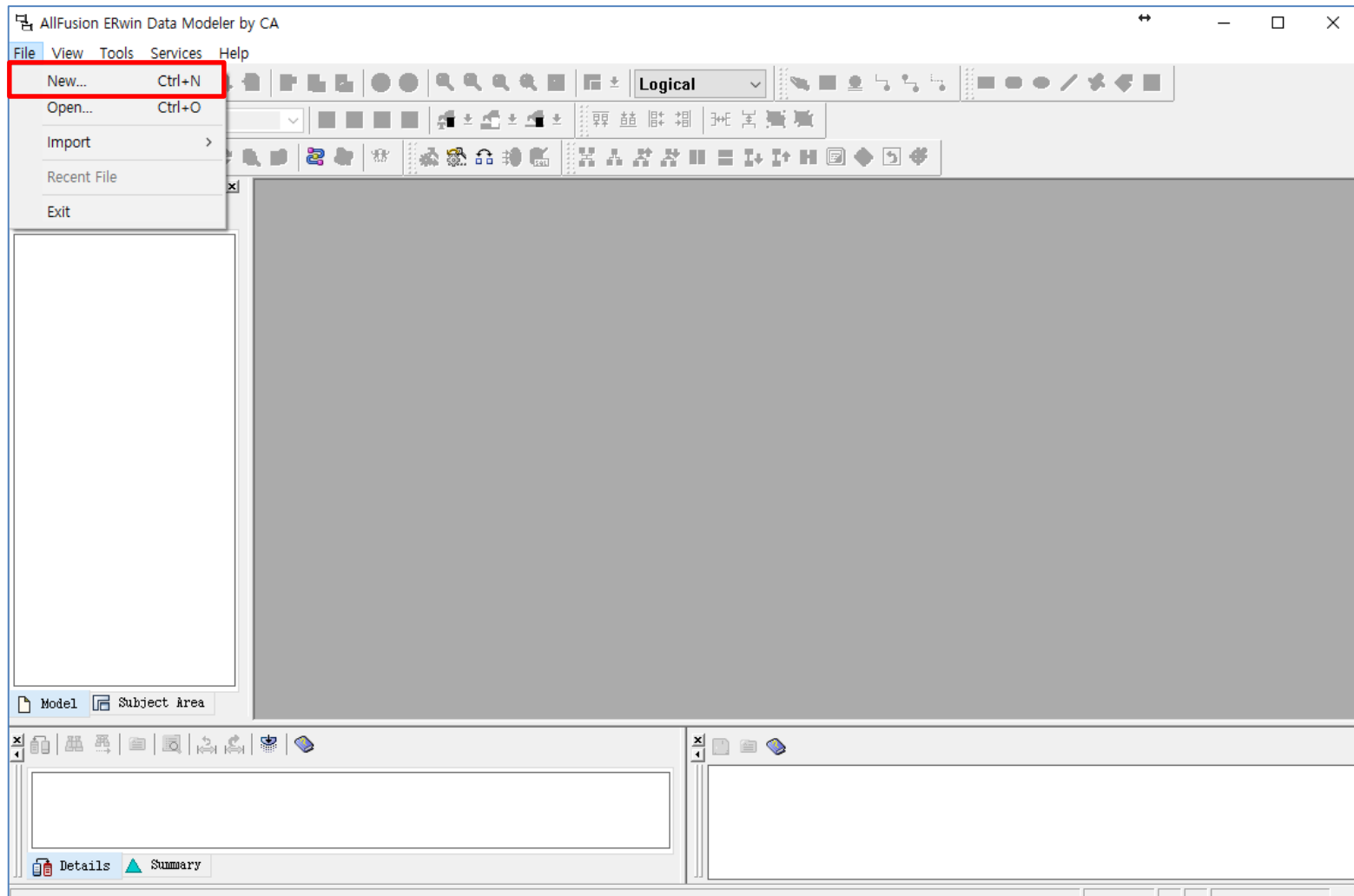
- 시작 → CA → Erwin Data Modeler r7



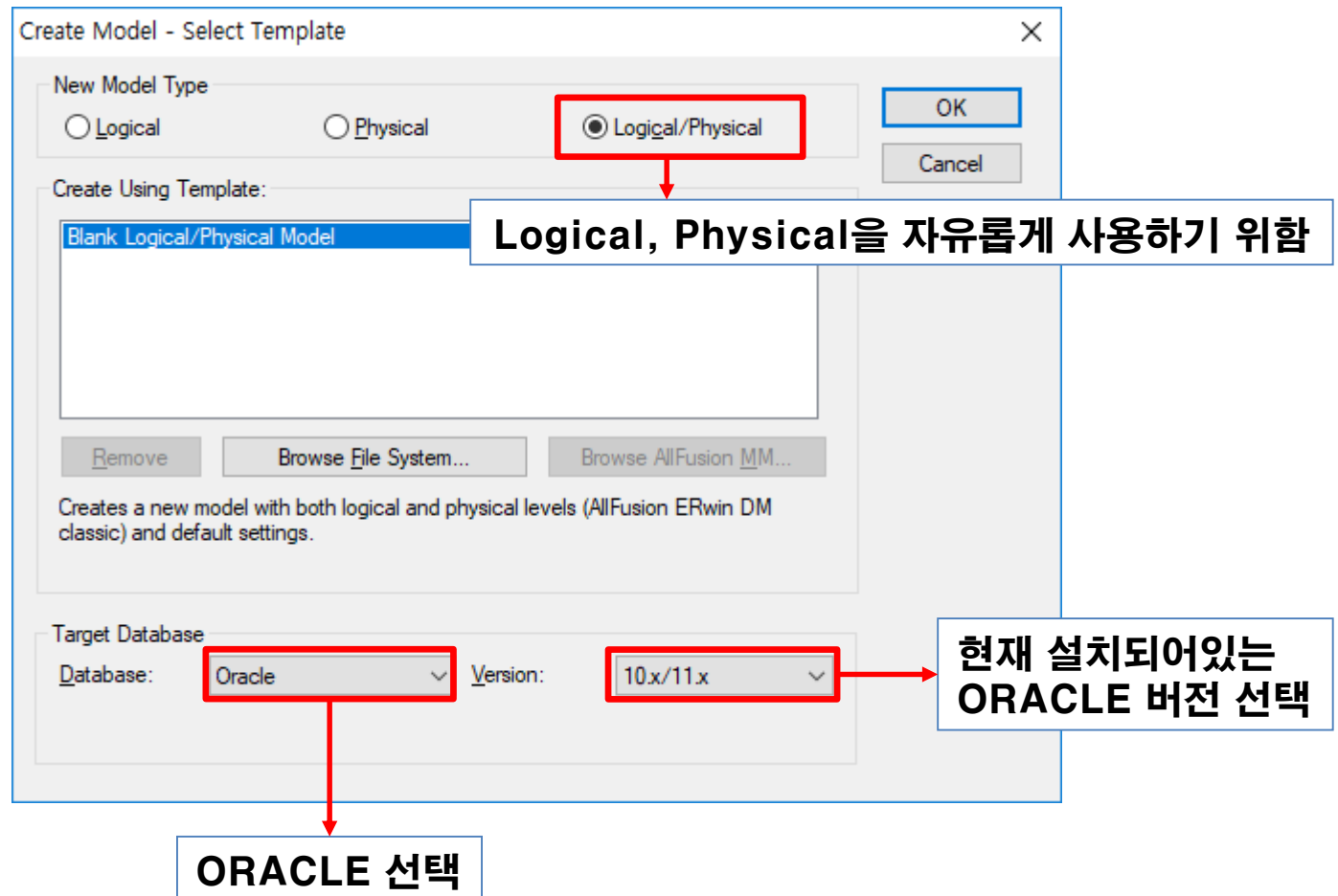
- Show tips on startup 체크 해제 → Close 클릭



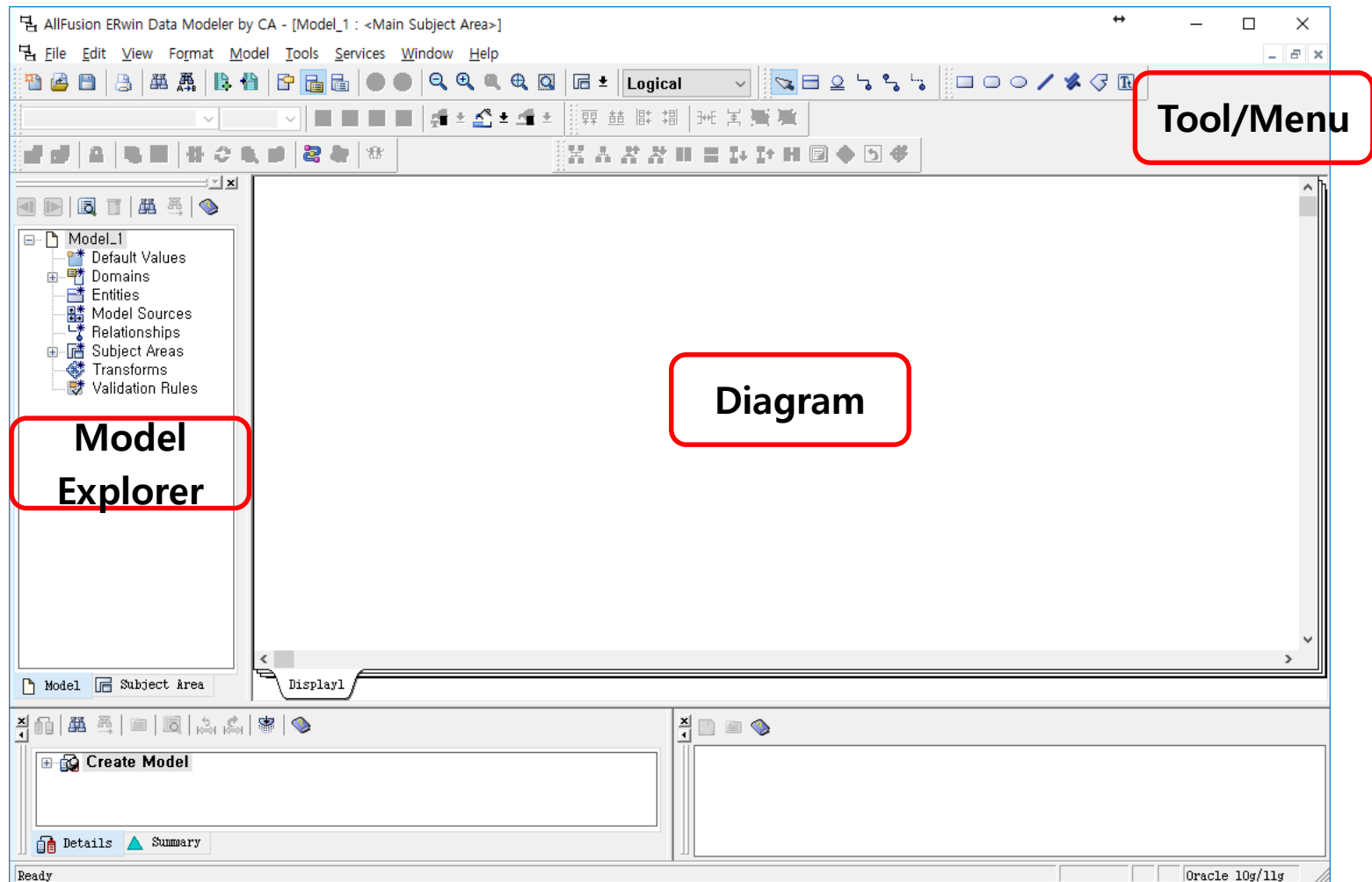
- 왼쪽 상단의 메뉴에서 File 클릭 후 New 클릭



- 아래 그림을 참고하여 설정한 뒤 OK 버튼 클릭

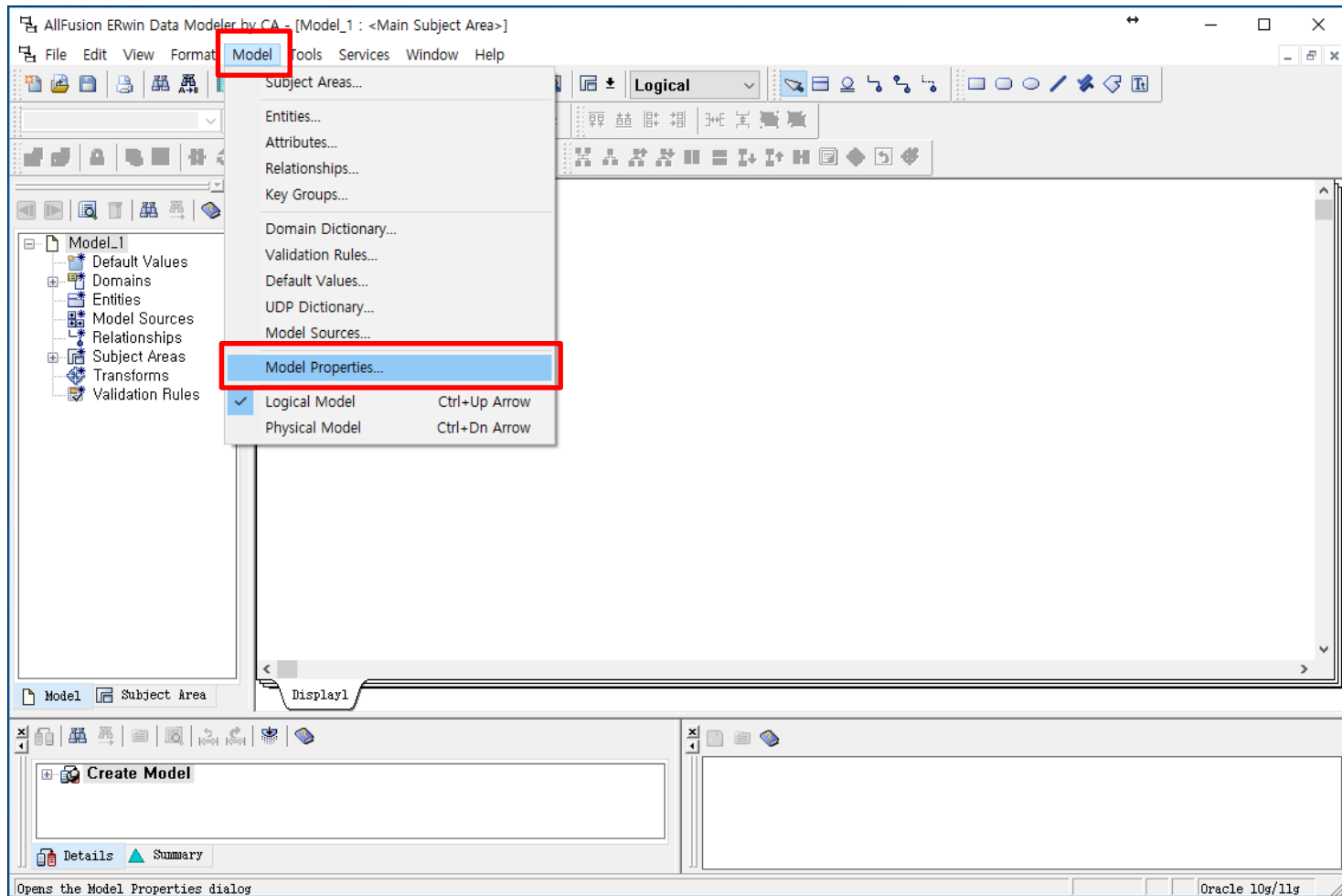


- 화면 구성

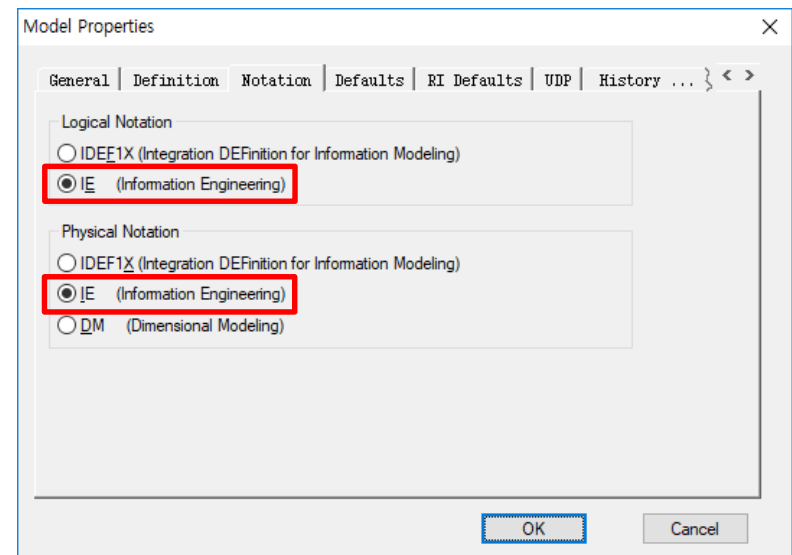
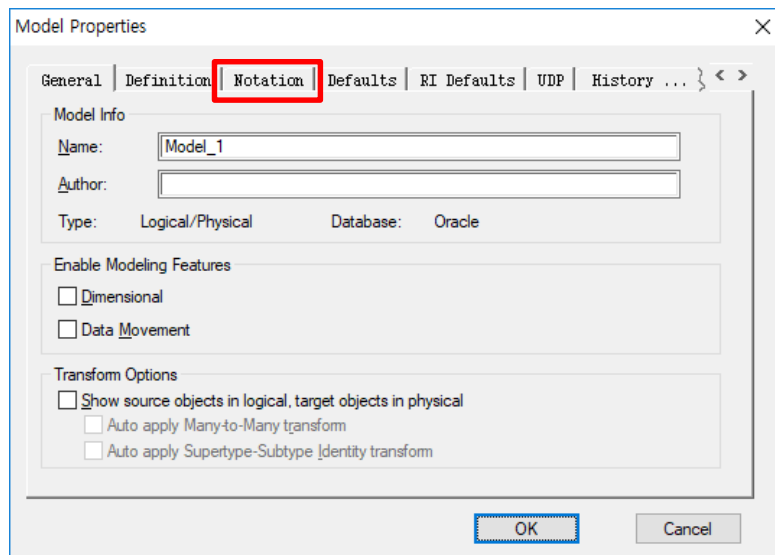


- ER-Win 표기 방식
 - 메인 화면이 열리면 어떤 표기방법을 사용할 것인지 선택해야 함
 - 두 가지 표기법 지원
 - ✓ **IE**(Information Engineering)
 - ✓ **IDEF1X**(Integration DEFinition for Information Modeling)

- IE 방식 설정 방법
 - Model → Model Properties



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



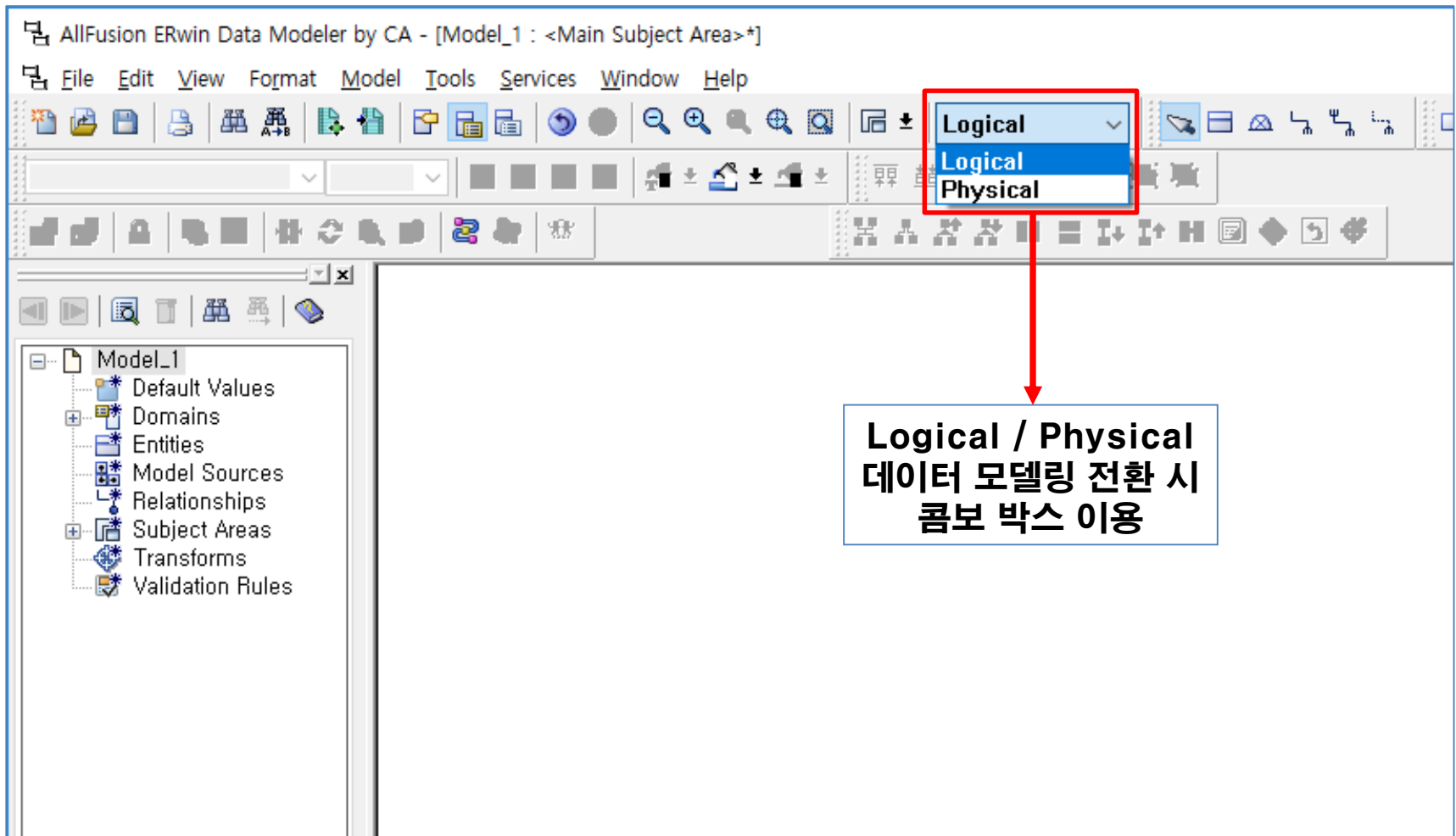
IDEF1X



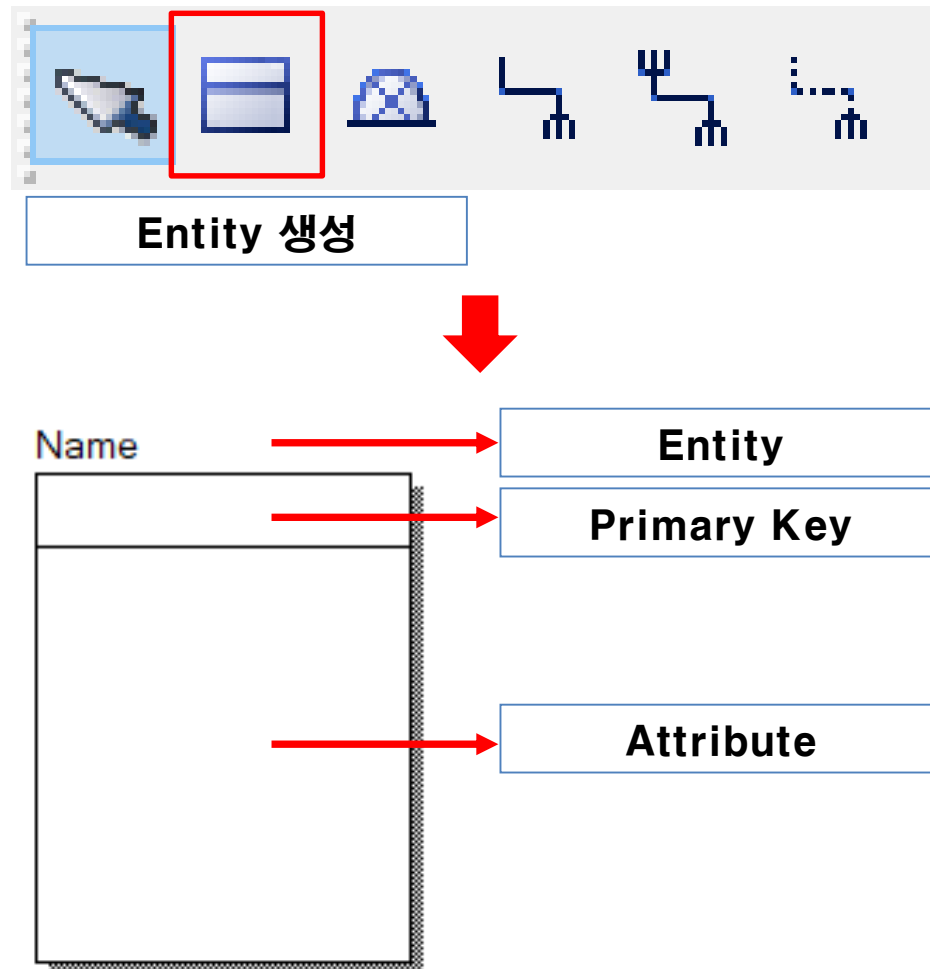
IE



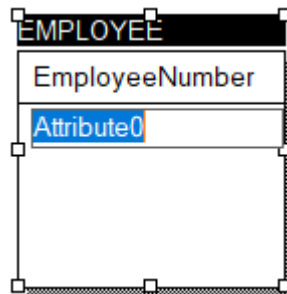
- Logical / Physical



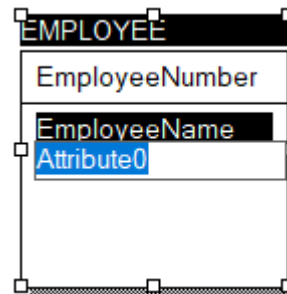
- Entity 생성



- Entity 생성
 - 예제) Employee Entity

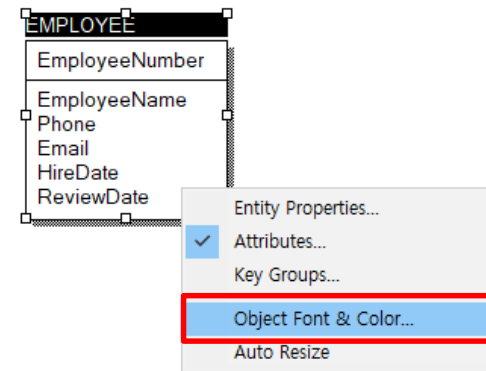
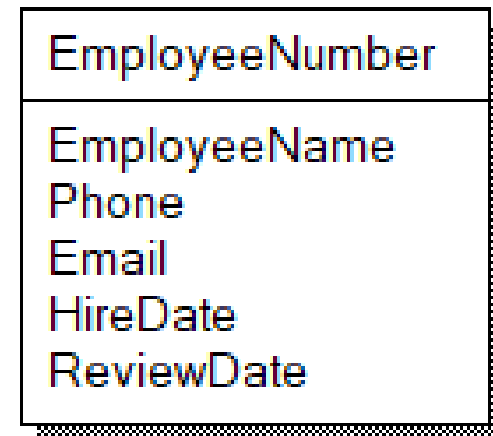


- 작성 후 **TAB** 키를 이용하여 다음으로 넘어갈 수 있음



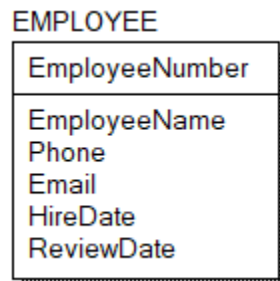
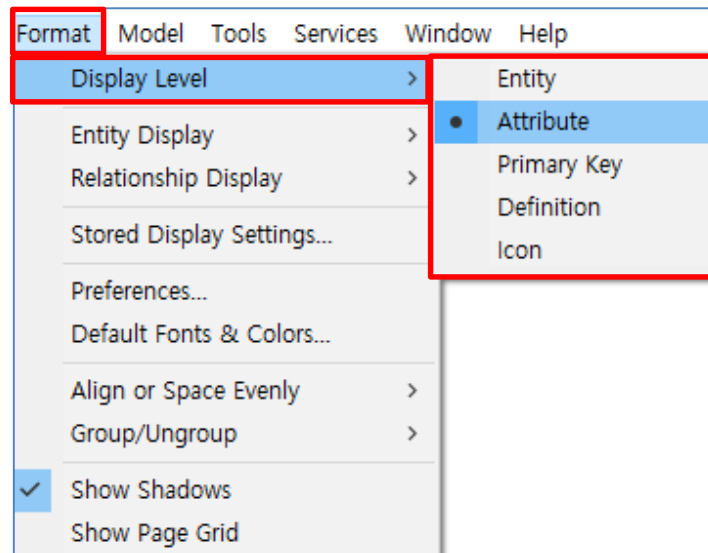
- 작성 후 **ENTER** 키를 이용하여 새로운 속성을 기술 할 수 있음

EMPLOYEE

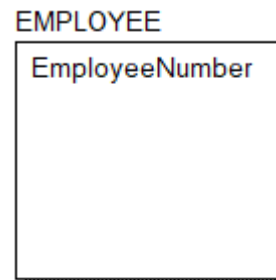


- Title Font 변경

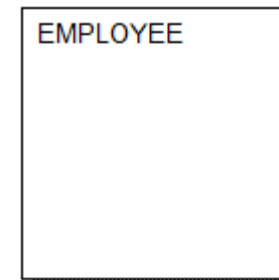
- Entity 속성 표현 방법
 - Format → Display Level → (선택)



Attribute 선택



Primary Key 선택



Entity 선택

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

22/41

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

COMPANY

CompanyName

City

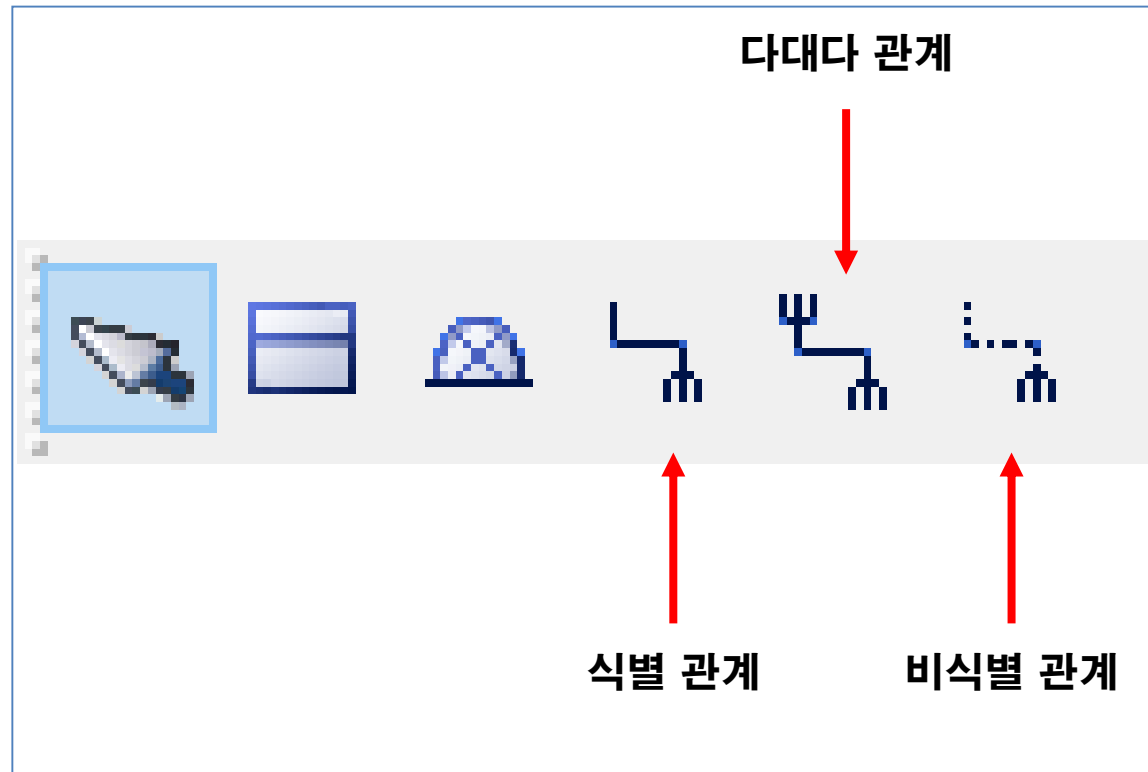
DEPARTMENT

DepartmentName

BudgetCode
MailShop

PHONE

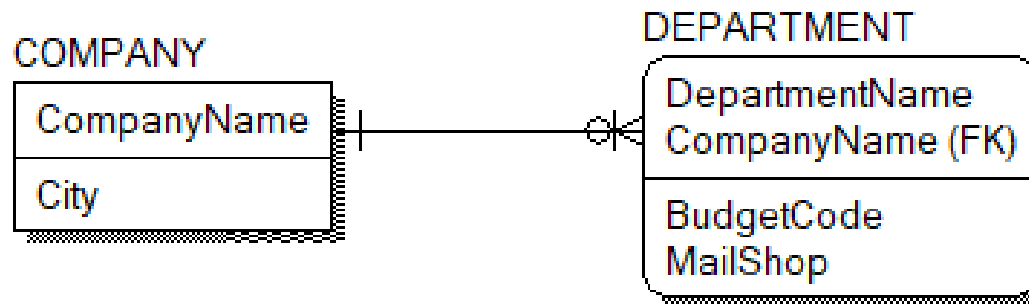
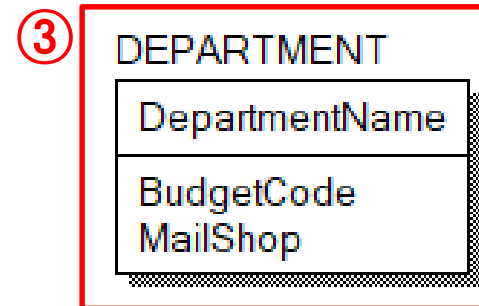
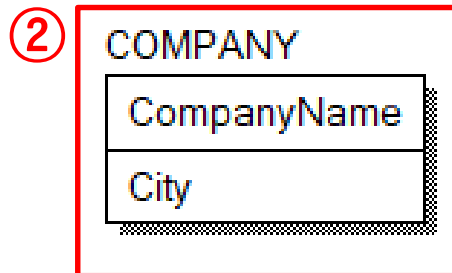
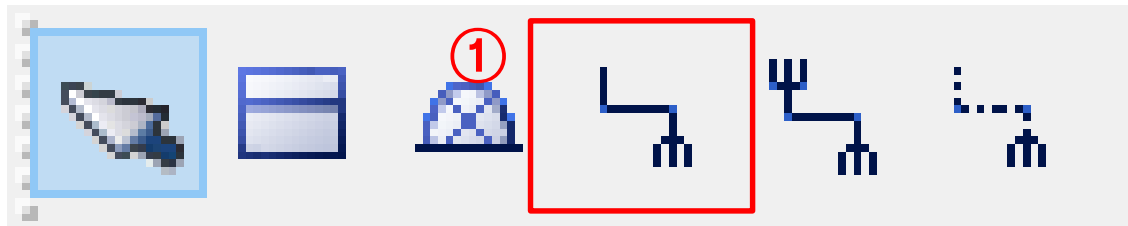
PhoneNumber



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

24/41

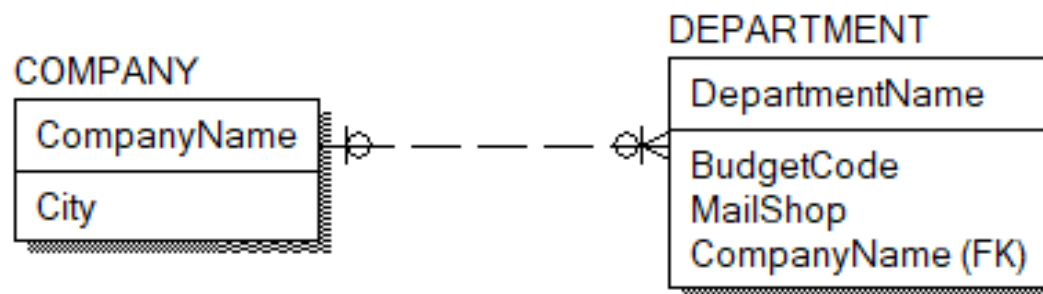
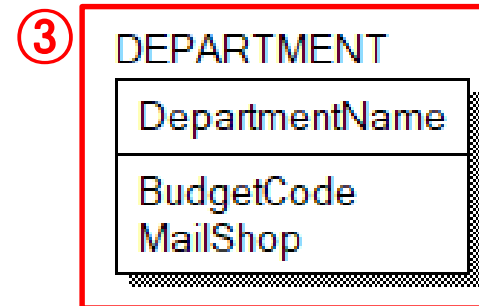
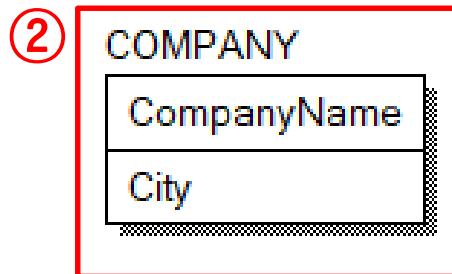
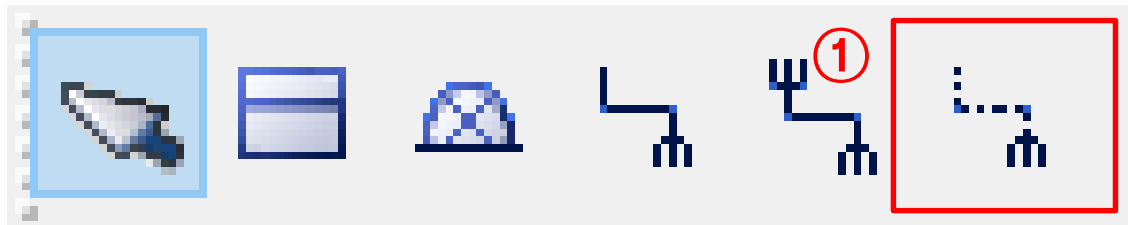
- 식별 관계



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

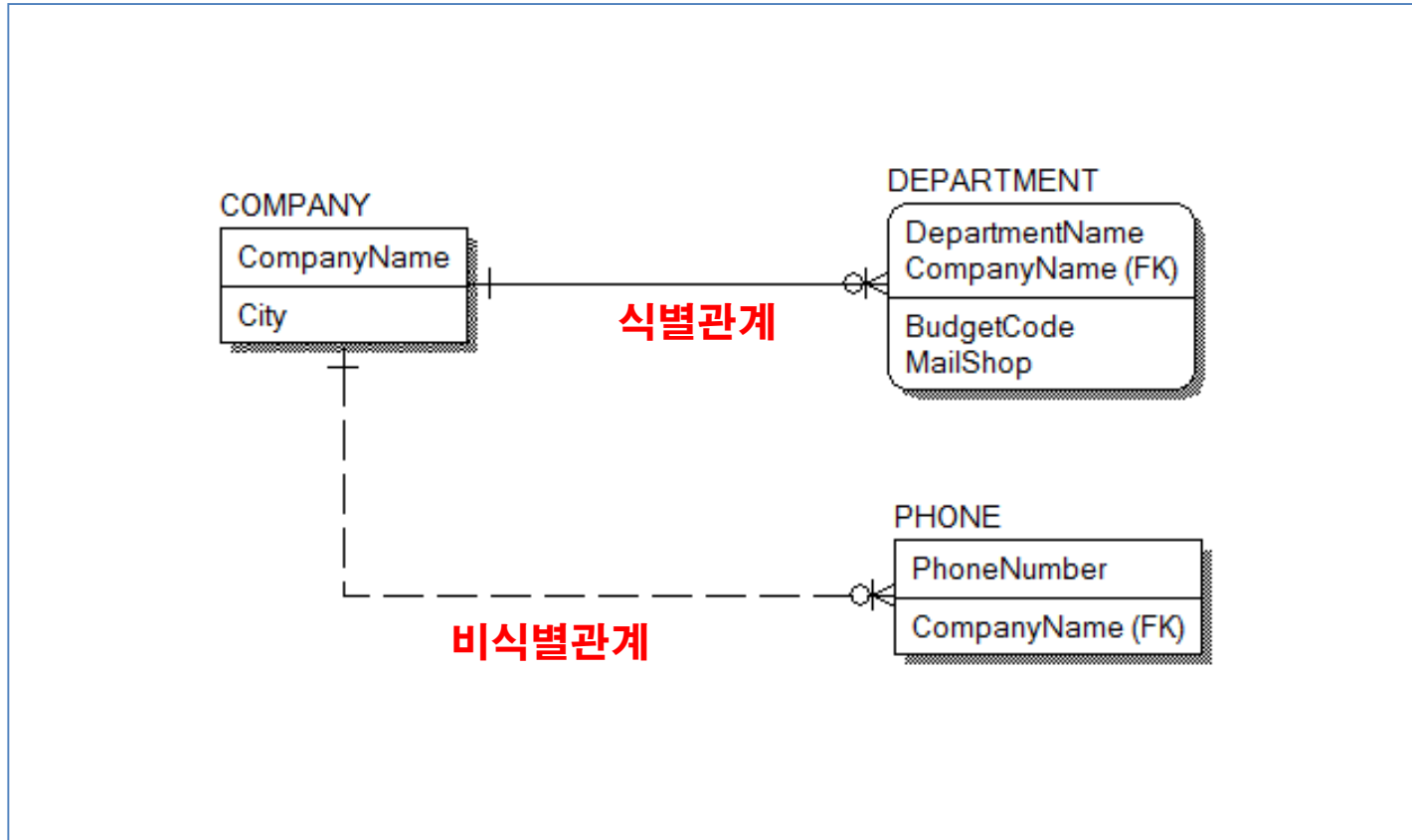
25/41

- 비식별 관계



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

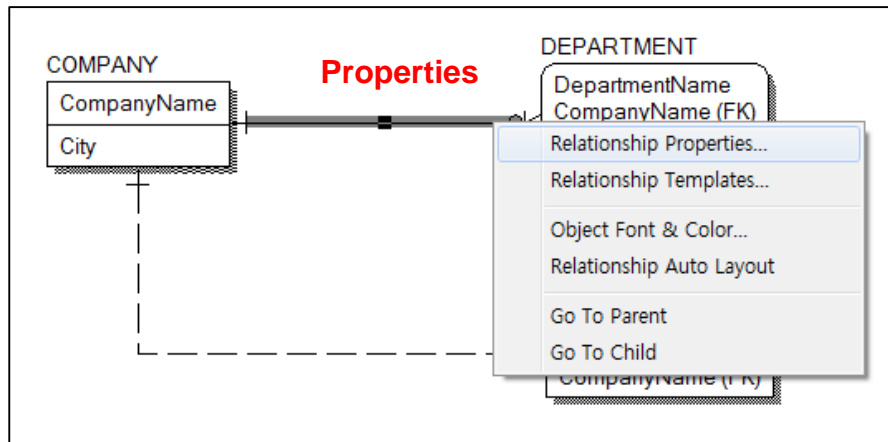
26/41



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

27/41

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



The 'Relationships' dialog box is shown with the 'General' tab selected. The relationship is named 'COMPANY Chairs to DEPARTMENT' with a cardinality of 'R/8'. The 'Verb Phrase' section shows 'Parent-to-Child' and 'Child-to-Parent' dropdowns. The 'Relationship Cardinality' section shows a summary of 'One to Zero One or More' and a 'Cardinality' section with radio buttons for 'Zero, One or More' (selected), 'One or More (P)', 'Zero or One (Z)', and 'Exactly'. The 'Relationship Type' section has radio buttons for 'Identifying' (selected) and 'Non-Identifying'. A 'Nuls' section has radio buttons for 'Nuls Allowed' and 'No Nuls'. A 'Logical Only' checkbox is at the bottom left, and a 'Reset Cardinality' button is at the bottom right. 'OK' and 'Cancel' buttons are at the bottom.

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

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• 카디널리티

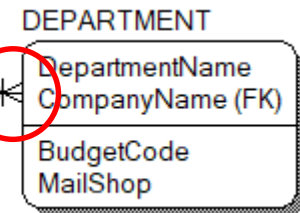
Cardinality

☒ Zero, One or More

☐ One or More (P)

☐ Zero or One (Z)

☐ Exactly:



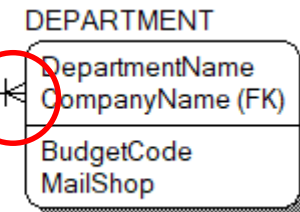
Cardinality

☐ Zero, One or More

☒ One or More (P)

☐ Zero or One (Z)

☐ Exactly:



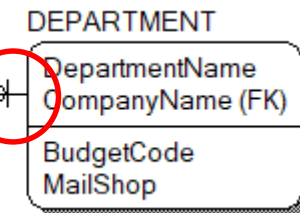
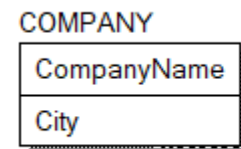
Cardinality

☐ Zero, One or More

☐ One or More (P)

☒ Zero or One (Z)

☐ Exactly:



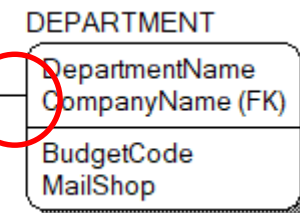
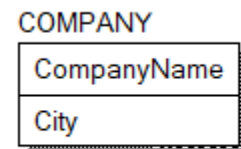
Cardinality

☐ Zero, One or More

☐ One or More (P)

☐ Zero or One (Z)

☒ Exactly:



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

29/41

- 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

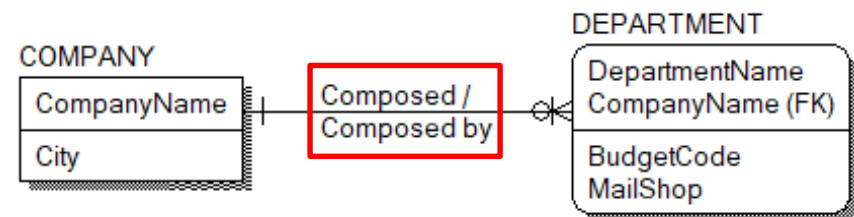
Referential Integrity

☒ Subtype Discriminator

Show Dangling Relationships

☒ Orthogonal Lines

Diagonal Lines



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

30/41

- 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

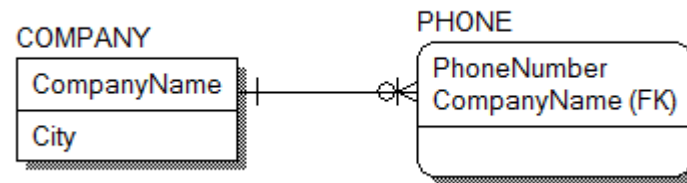
OK Cancel

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

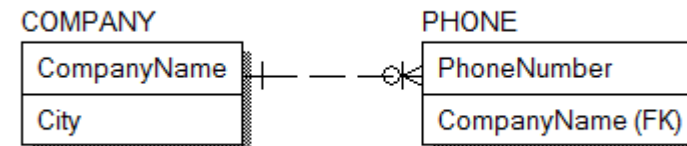
31/41

- Relationship Type

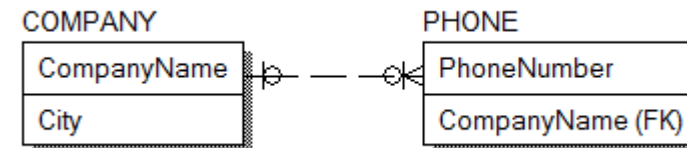
- ☒ Identifying
☐ Non-Identifying



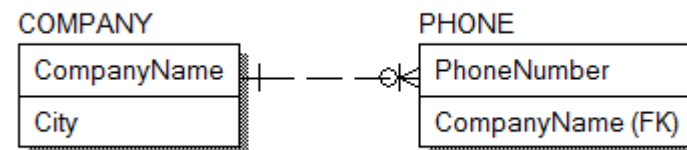
- ☐ Identifying
☒ Non-Identifying



- Nulls
☒ Nulls Allowed
☐ No Nulls



- Nulls
☐ Nulls Allowed
☒ No Nulls



모델링 : Many-to-Many Relationship (1/5) 32/41

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

- Logical에서 존재

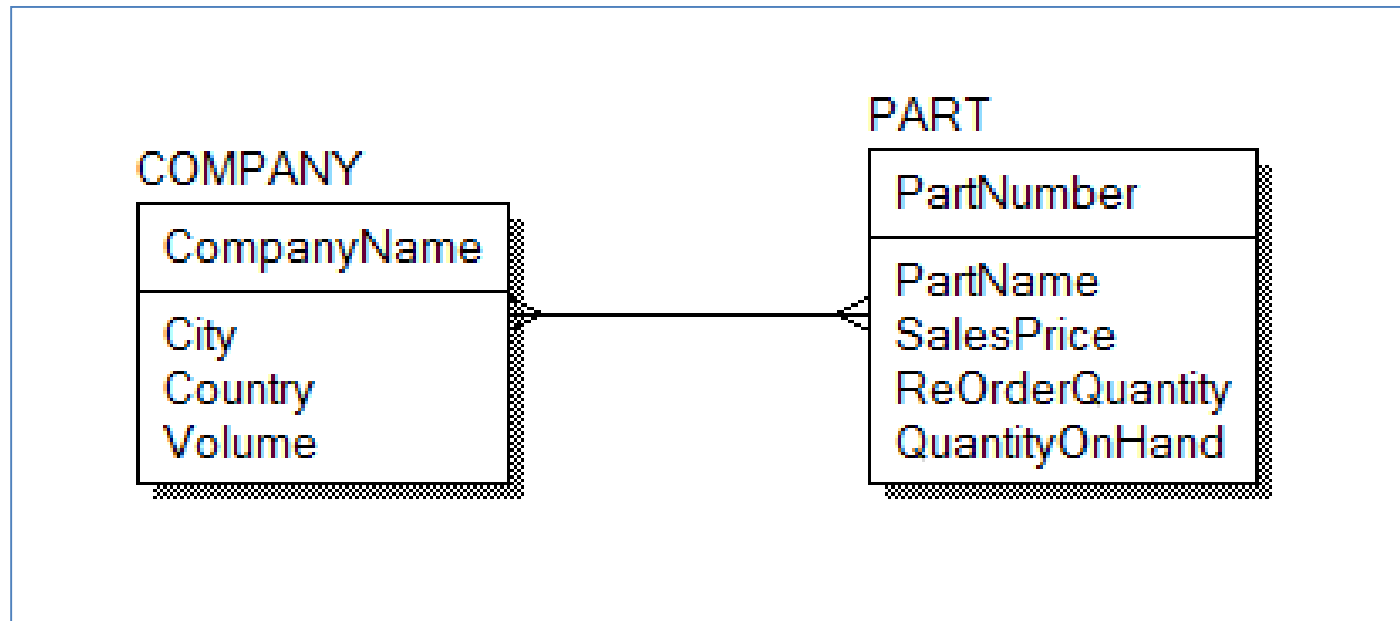


다대다 관계

모델링 : Many-to-Many Relationship (2/5) 33/41

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

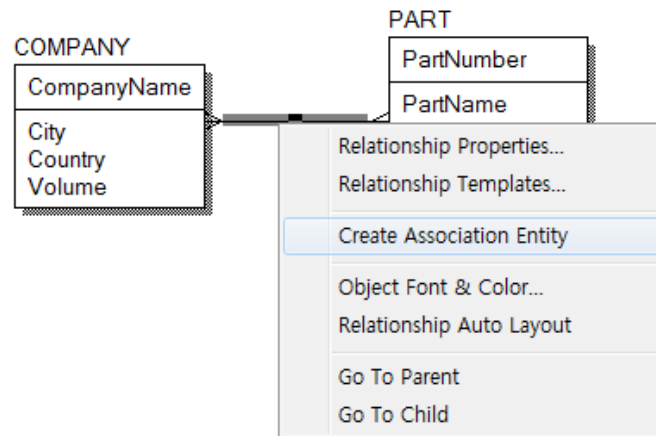
- Entity를 생성한 후 순서에 관계 없이 두 Entity를 차례대로 선택



모델링 : Many-to-Many Relationship (3/5) 34/41

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

- 관계를 해소하는 방법



- 관계 선택
→ 마우스 오른쪽 버튼
→ Create Association Entity



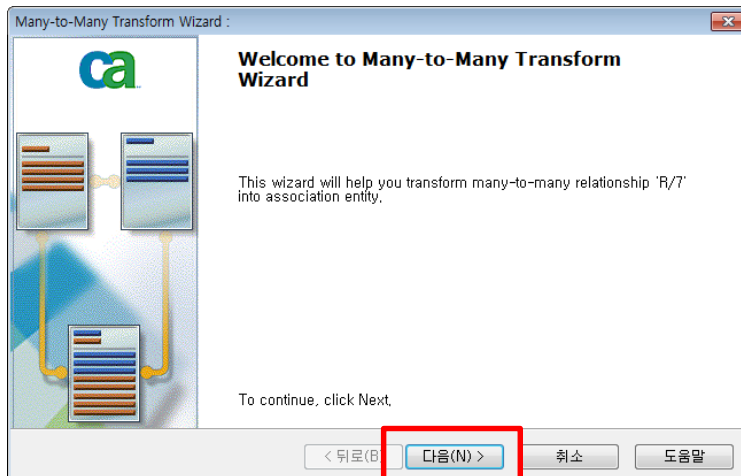
- 관계 선택
→ 'ERwin Transform Toolbar' 에서
'Many to Many Transform' 선택

모델링 : Many-to-Many Relationship (4/5) 35/41

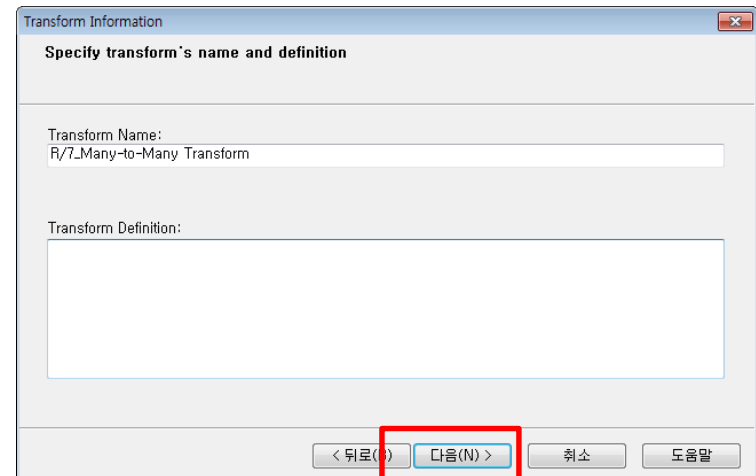
Many - To - Many Relationship (N:M 관계)

- 관계를 해소하는 방법

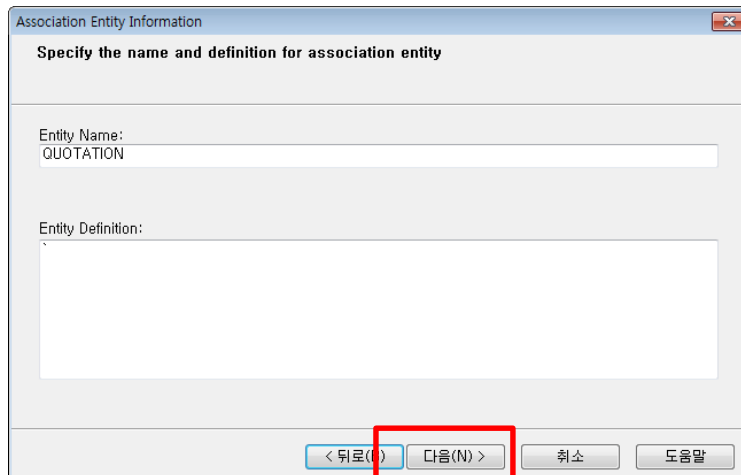
①



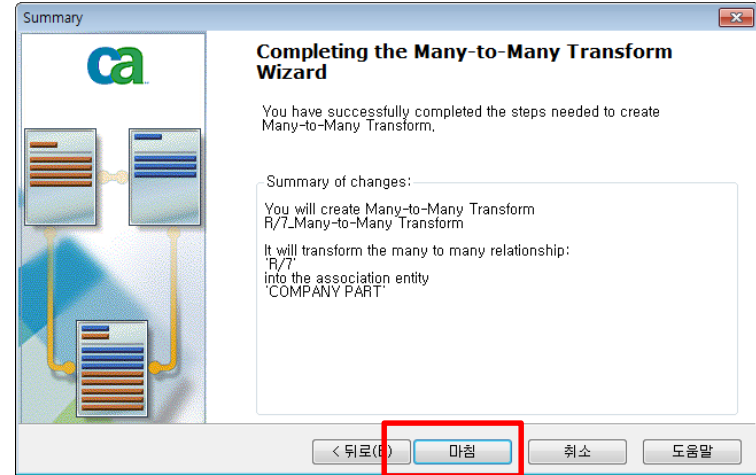
②



③



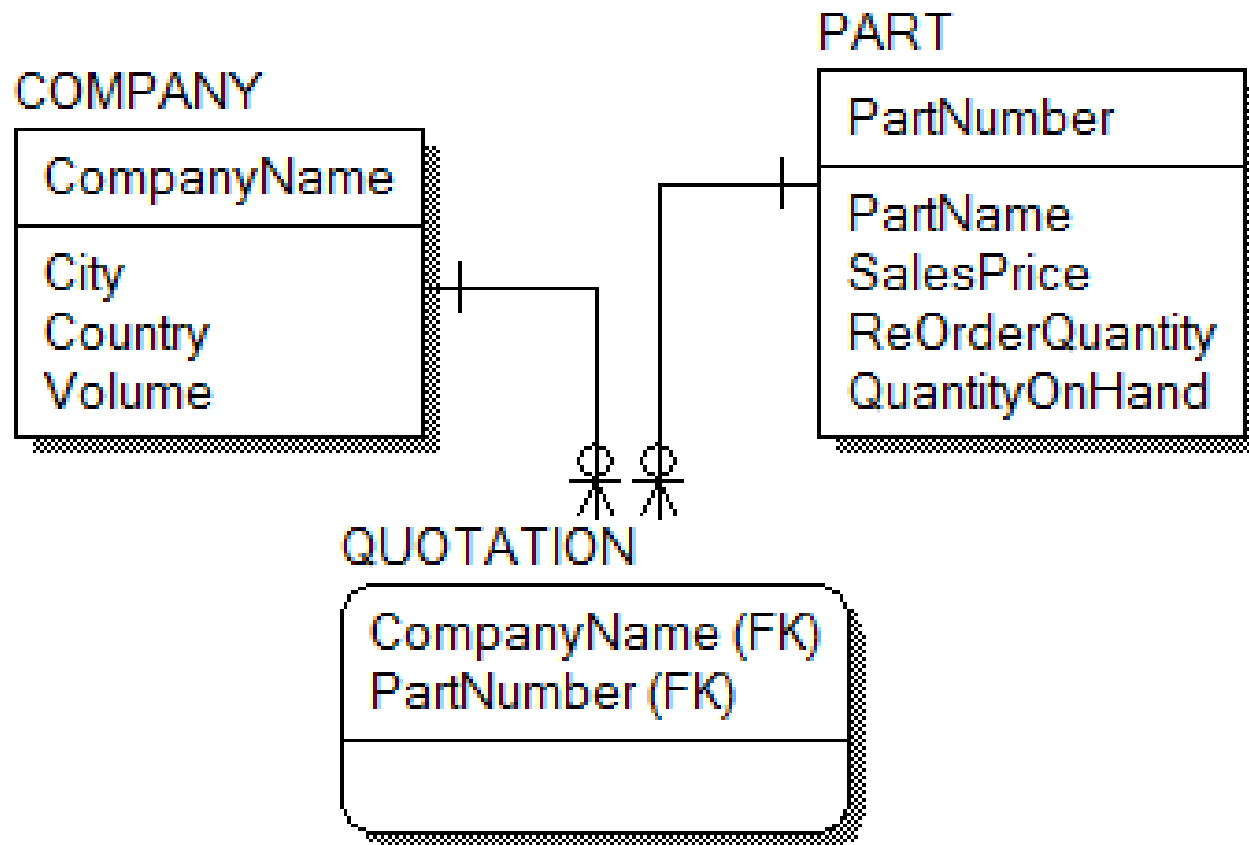
④



모델링 : Many-to-Many Relationship (5/5) 36/41

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

- 관계 해소 예제



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

EMP

Empno
Ename
Job
MGR
Hiredate
Sal
Comm

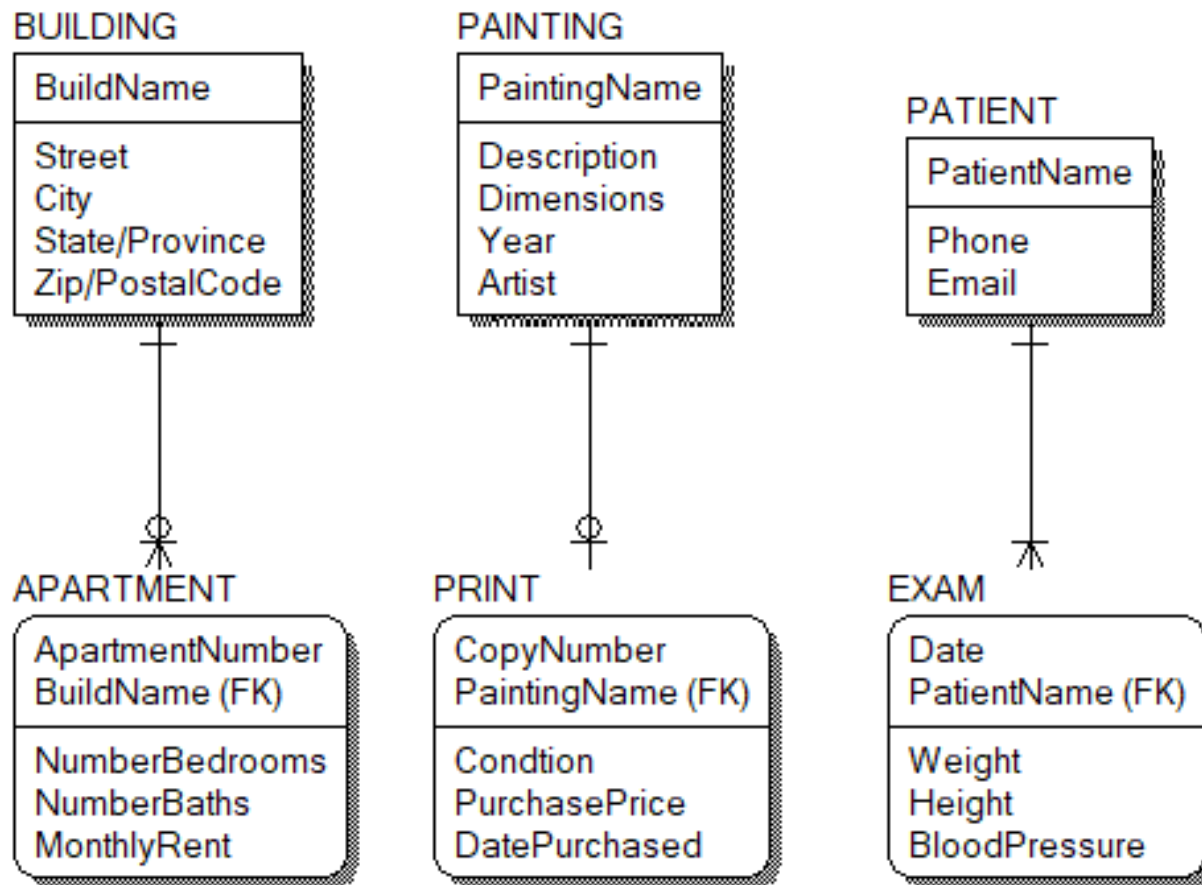
DEPT

Deptno
Dname
Loc

CUSTOMER

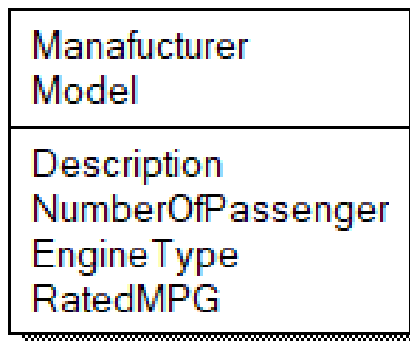
CID
Password
CName
Mail
PhoneNumber
JoinDate

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

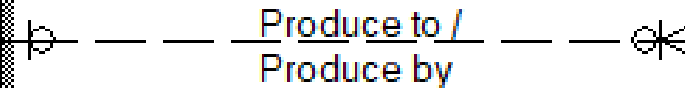
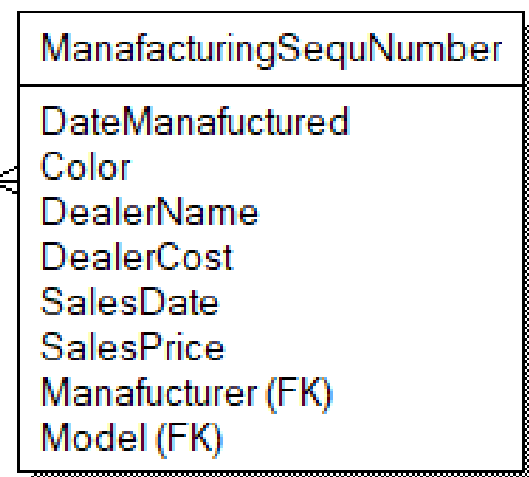


Q3) ER-Win 프로그램을 사용하여 아래와 같은 동일한 데이터베이스 모델을 작성하시오.

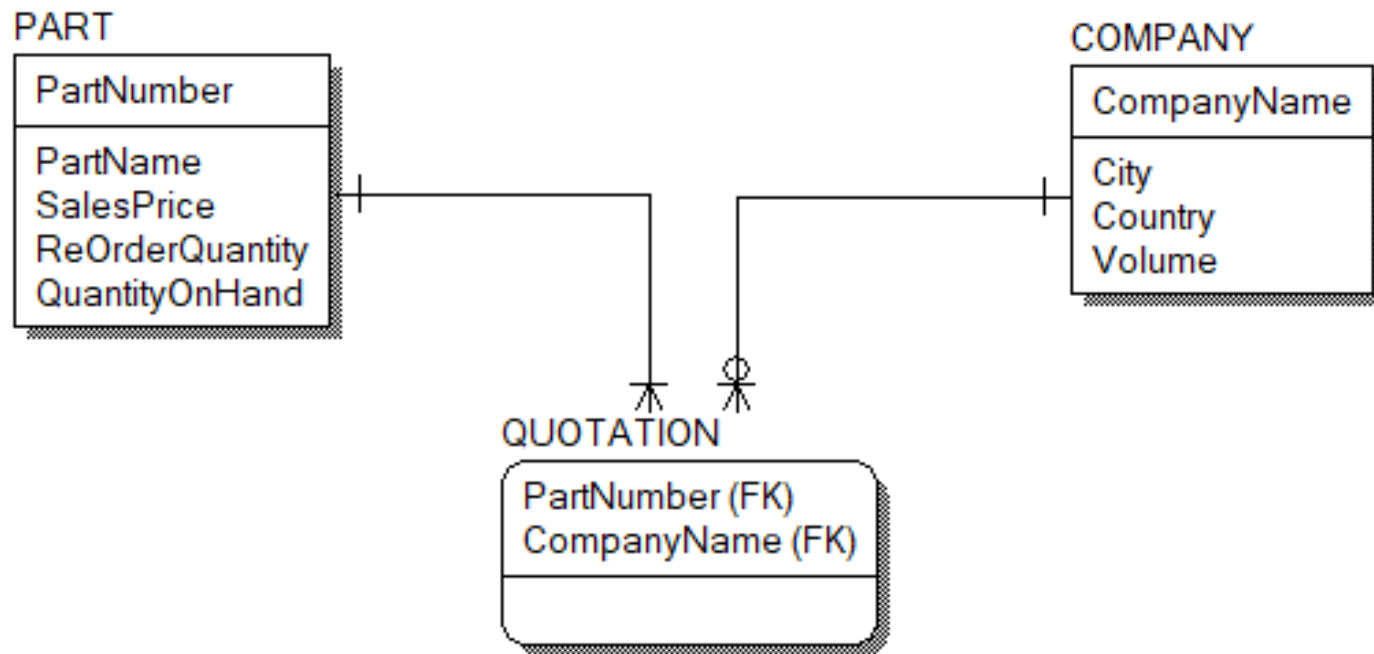
AUTO_MODEL



VEHICLE



Q4) 아래와 같은 모델을 작성하시오.



- 제출 방식 : E-Class를 통하여 제출
- 제출 기한 : 10월 4일(월) 오후 2시까지 제출 (연장 제출 불가)

<DB설계 과제 수행계획서>

작성일 :

학 번 :

이 름 :

주 제	
내 용	<p><작성 내용></p> <ul style="list-style-type: none">- 아래의 내용을 간략히 작성할 것 (A4, 1-2페이지) <ol style="list-style-type: none">1. 개요2. 데이터베이스 요구사항3. 주요 entity type <p>※ 안내 사항</p> <ul style="list-style-type: none">- 데이터베이스 모델링, 설계, 구현을 수행해야 함 (ER-Win, Oracle 활용)- 현실에서 사용되는 주제를 다루어야 하며, 수업에서 다루는 주제 불가함- 수업 진행에 따라 프로젝트 내용 수정이 가능함 (중간 점검 시, 수정 계획서 제출)- DB설계를 수행하지 않을 경우, 성적 F를 부여함