

## Chapter 1.

Oracle

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(ERD :

Entity-Relational Diagram)

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### (Relational Data Model)

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1970 E. F. Codd "A Relational Model of Data for Large Shared Data Banks"

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(RDBMS)

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- (Entity) : ,
- (Relationship) : ,
- (Attribute) : ,

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(FK : Foreign Key),

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| EMPNO | ENAME  | JOB       | MGR  | HIREDATE | SAL  | COMM | DEPTNO |
|-------|--------|-----------|------|----------|------|------|--------|
| 7369  | SMITH  | CLERK     | 7902 | 80/12/17 | 800  |      | 20     |
| 7499  | ALLEN  | SALESMAN  | 7698 | 81/02/20 | 1600 | 300  | 30     |
| 7521  | WARD   | SALESMAN  | 7698 | 81/02/22 | 1250 | 500  | 30     |
| 7566  | JONES  | MANAGER   | 7839 | 81/04/02 | 2975 |      | 20     |
| 7654  | MARTIN | SALESMAN  | 7698 | 81/09/28 | 1250 | 1400 | 30     |
| 7698  | BLAKE  | MANAGER   | 7839 | 81/05/01 | 2850 |      | 30     |
| 7782  | CLARK  | MANAGER   | 7839 | 81/06/09 | 2450 |      | 10     |
| 7788  | SCOTT  | ANALYST   | 7566 | 87/04/19 | 3000 |      | 20     |
| 7839  | KING   | PRESIDENT |      | 81/11/17 | 5000 |      | 10     |
| 7844  | TURNER | SALESMAN  | 7698 | 81/09/08 | 1500 | 0    | 30     |
| 7876  | ADAMS  | CLERK     | 7788 | 87/05/23 | 1100 |      | 20     |
| 7900  | JAMES  | CLERK     | 7698 | 81/12/03 | 950  |      | 30     |
| 7902  | FORD   | ANALYST   | 7566 | 81/12/03 | 3000 |      | 20     |
| 7934  | MILLER | CLERK     | 7782 | 82/01/23 | 1300 |      | 10     |

## 1-1. EMP

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| EMPNO | ENAME  | JOB       | MGR  | HIREDATE | SAL  | COMM | DEPTNO |
|-------|--------|-----------|------|----------|------|------|--------|
| 7369  | SMITH  | CLERK     | 7902 | 80/12/17 | 800  |      | 20     |
| 7499  | ALLEN  | SALESMAN  | 7698 | 81/02/20 | 1600 | 300  | 30     |
| 7521  | WARD   | SALESMAN  | 7698 | 81/02/22 | 1250 | 500  | 30     |
| 7566  | JONES  | MANAGER   | 7839 | 81/04/02 | 2975 |      | 20     |
| 7654  | MARTIN | SALESMAN  | 7698 | 81/09/28 | 1250 | 1400 | 30     |
| 7698  | BLAKE  | MANAGER   | 7839 | 81/05/01 | 2850 |      | 30     |
| 7782  | CLARK  | MANAGER   | 7839 | 81/06/09 | 2450 |      | 10     |
| 7788  | SCOTT  | ANALYST   | 7566 | 87/04/19 | 3000 |      | 20     |
| 7839  | KING   | PRESIDENT |      | 81/11/17 | 5000 |      | 10     |
| 7844  | TURNER | SALESMAN  | 7698 | 81/09/08 | 1500 | 0    | 30     |
| 7876  | ADAMS  | CLERK     | 7788 | 87/05/23 | 1100 |      | 20     |
| 7900  | JAMES  | CLERK     | 7698 | 81/12/03 | 950  |      | 30     |
| 7902  | FORD   | ANALYST   | 7566 | 81/12/03 | 3000 |      | 20     |
| 7934  | MILLER | CLERK     | 7782 | 82/01/23 | 1300 |      | 10     |

## 1-2.

(Row) :

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(PK : Primay Key) : (EMPNO)

(Column) : (SAL) 가

(FK : Foreign Key) :

(DEPTNO)

(Unique) (DEPT)

(DEPTNO)

(Field) : (Field)

(Null) : "NULL"

. NULL 가 , "

(Undefine)" " (Unknown)" , 0(Zero)

(Space) 가

(PK) (FK)

ERD

(PK :

Primary Key) (FK : Foreign Key)

PK

| DEPTNO | DNAME      | LOC      |
|--------|------------|----------|
| 10     | ACCOUNTING | NEW YORK |
| 20     | RESEARCH   | DALLAS   |
| 30     | SALES      | CHICAGO  |
| 40     | OPERATIONS | BOSTON   |

PK FK

| EMPNO | ENAME  | JOB       | MGR  | HIREDATE | SAL  | COMM | DEPTNO |
|-------|--------|-----------|------|----------|------|------|--------|
| 7369  | SMITH  | CLERK     | 7902 | 80/12/17 | 800  |      | 20     |
| 7499  | ALLEN  | SALESMAN  | 7698 | 81/02/20 | 1600 | 300  | 30     |
| 7521  | WARD   | SALESMAN  | 7698 | 81/02/22 | 1250 | 500  | 30     |
| 7566  | JONES  | MANAGER   | 7839 | 81/04/02 | 2975 |      | 20     |
| 7654  | MARTIN | SALESMAN  | 7698 | 81/09/28 | 1250 | 1400 | 30     |
| 7698  | BLAKE  | MANAGER   | 7839 | 81/05/01 | 2850 |      | 30     |
| 7782  | CLARK  | MANAGER   | 7839 | 81/06/09 | 2450 |      | 10     |
| 7788  | SCOTT  | ANALYST   | 7566 | 87/04/19 | 3000 |      | 20     |
| 7839  | KING   | PRESIDENT |      | 81/11/17 | 5000 |      | 10     |
| 7844  | TURNER | SALESMAN  | 7698 | 81/09/08 | 1500 | 0    | 30     |
| 7876  | ADAMS  | CLERK     | 7788 | 87/05/23 | 1100 |      | 20     |
| 7900  | JAMES  | CLERK     | 7698 | 81/12/03 | 950  |      | 30     |
| 7902  | FORD   | ANALYST   | 7566 | 81/12/03 | 3000 |      | 20     |
| 7934  | MILLER | CLERK     | 7782 | 82/01/23 | 1300 |      | 10     |

1-3.

가 . 가 ,  
가 . ,  
(DEPTNO)  
(DEPTNO)  
(DNAME), (LOC) 가 ( NULL  
) (DNAME) (LOC) NULL  
가  
가  
(DEPTNO)가  
(EMPNO)

가

가

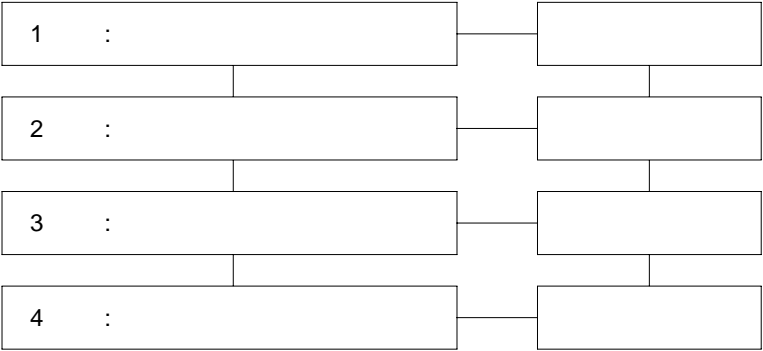
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ERD

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1-4.

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( (PK), , )

( (PK), , , (FK))

4)

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)

: DEPT

|        |    | Null/<br>Unique |  | FK | FK |          |    |
|--------|----|-----------------|--|----|----|----------|----|
| DEPTNO | PK | NN, U           |  |    |    | VARCHAR2 | 3  |
| DNAME  |    | NN              |  |    |    | VARCHAR2 | 10 |
| LOC    |    |                 |  |    |    | VARCHAR2 | 10 |

: EMP

|         |    | Null/<br>Unique |  | FK   | FK     |          |    |
|---------|----|-----------------|--|------|--------|----------|----|
| EMPNO   | PK | NN, U           |  |      |        | VARCHAR2 | 5  |
| ENAME   |    | NN              |  |      |        | VARCHAR2 | 10 |
| ADDRESS |    |                 |  |      |        | VARCHAR2 | 10 |
| DEPTNO  | FK |                 |  | DEPT | DEPTNO | VARCHAR2 | 3  |

## ERD(Entity-Relationship Diagram)

ERD 4

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ERD

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가 CA(Computer

ERD

Associates) Erwin

Erwin

Erwin

ERD

Erwin

Erwin

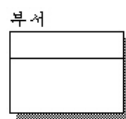
CA

Erwin

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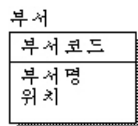
(Entity)

Erwin



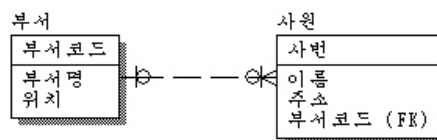
(Attribute)

Erwin



(Relationship)

Erwin



ERD

(Cardinality)

1:M(Many)

1:1

M:M

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1:1,

1:M,

M:M

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M:M

1:M

Erwin

가 1

(Crow's foot)

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Erwin

, M

(Optional),

(Mandatory)

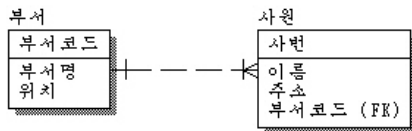
가

ERD

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ERD

가 1:M



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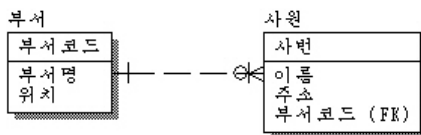
.(Mandatory)

.(Mandatory)

ERD

ERD

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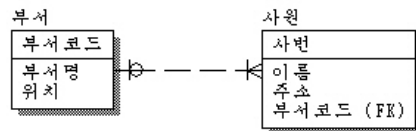
.(Optional)

.(Mandatory)

ERD

ERD

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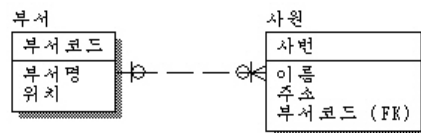
:  
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.(Mandatory)

.(Optional)

ERD

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.(Optional)

.(Optional)

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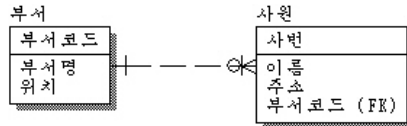


Erwin  
(Non-Identifying) , 가 1

M

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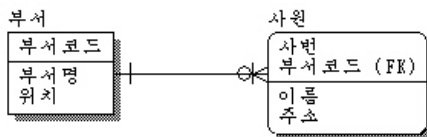
(Identifying)

가 1

M

가

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1:M

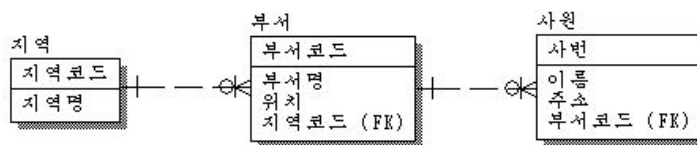
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ERD

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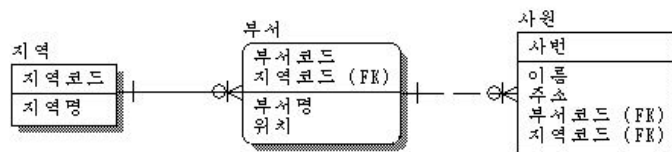
(Join)



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(Join) 가



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