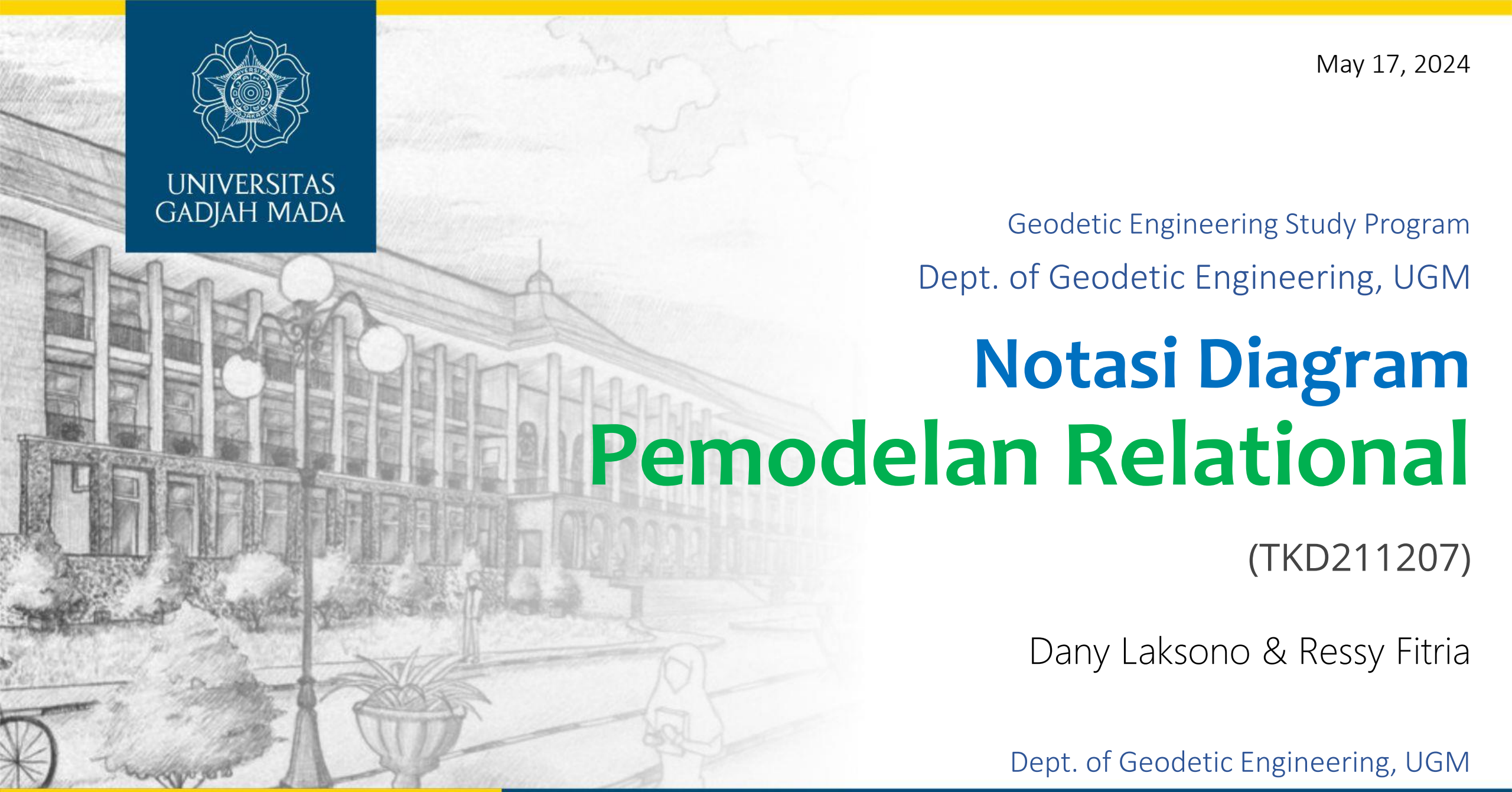

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May 17, 2024

Geodetic Engineering Study Program

Dept. of Geodetic Engineering, UGM

Notasi Diagram Pemodelan Relational

(TKD211207)

Dany Laksono & Ressy Fitria

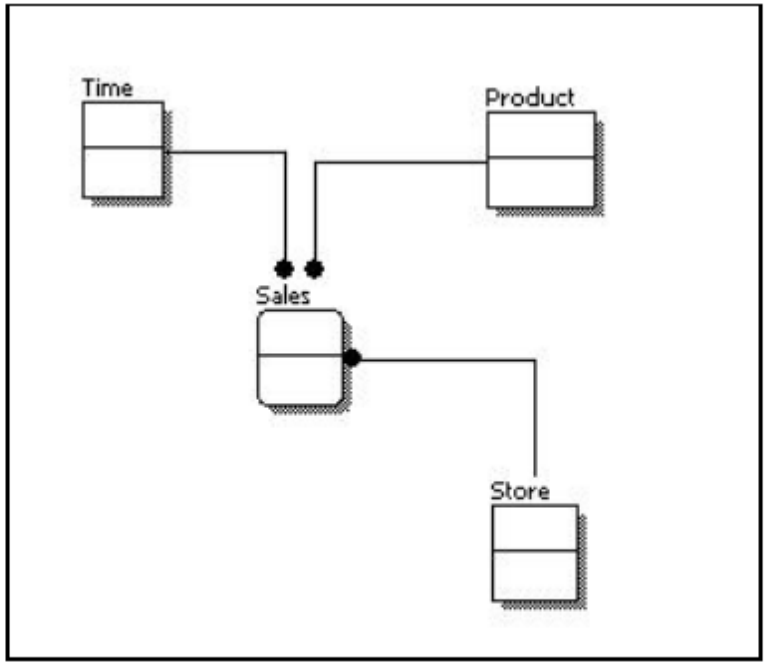
Dept. of Geodetic Engineering, UGM

Notasi Diagram Pemodelan Relasional

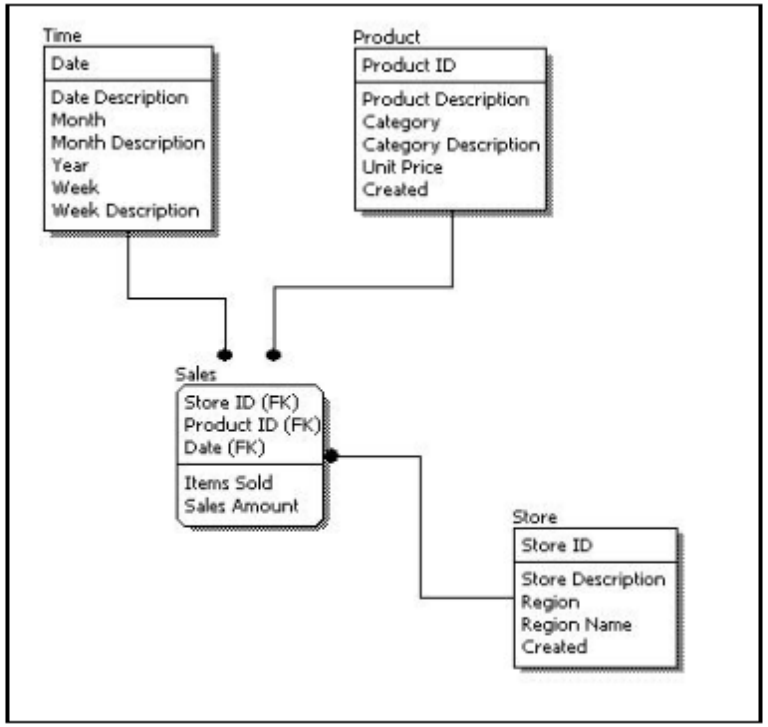
- Notasi-Notasi Diagram
- Merubah ERD ke Relational Model Diagram
- Relational Constraints
- Diagram UML
- Forward dan Reverse Engineering Modeling

Tahapan Pemodelan Data

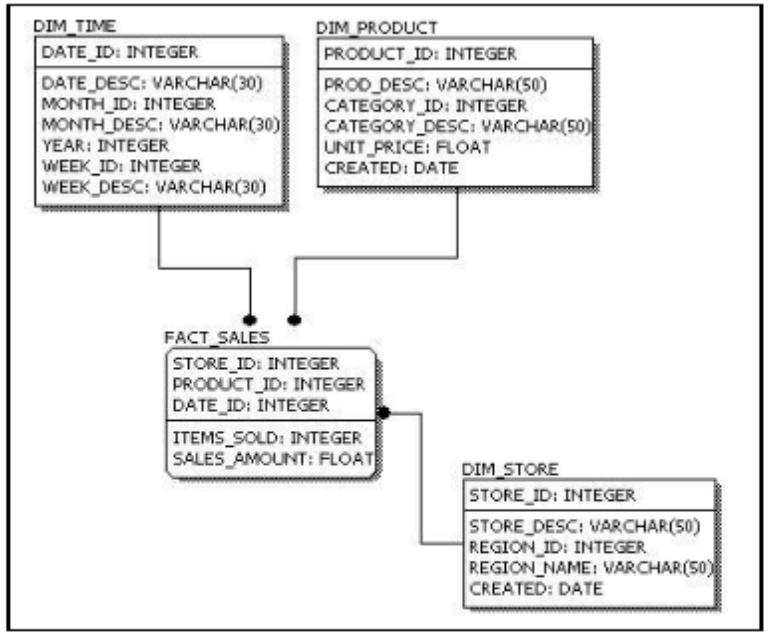
Conceptual Model Design



Logical Model Design



Physical Model Design



User (High Level) (Low Level) **Database**

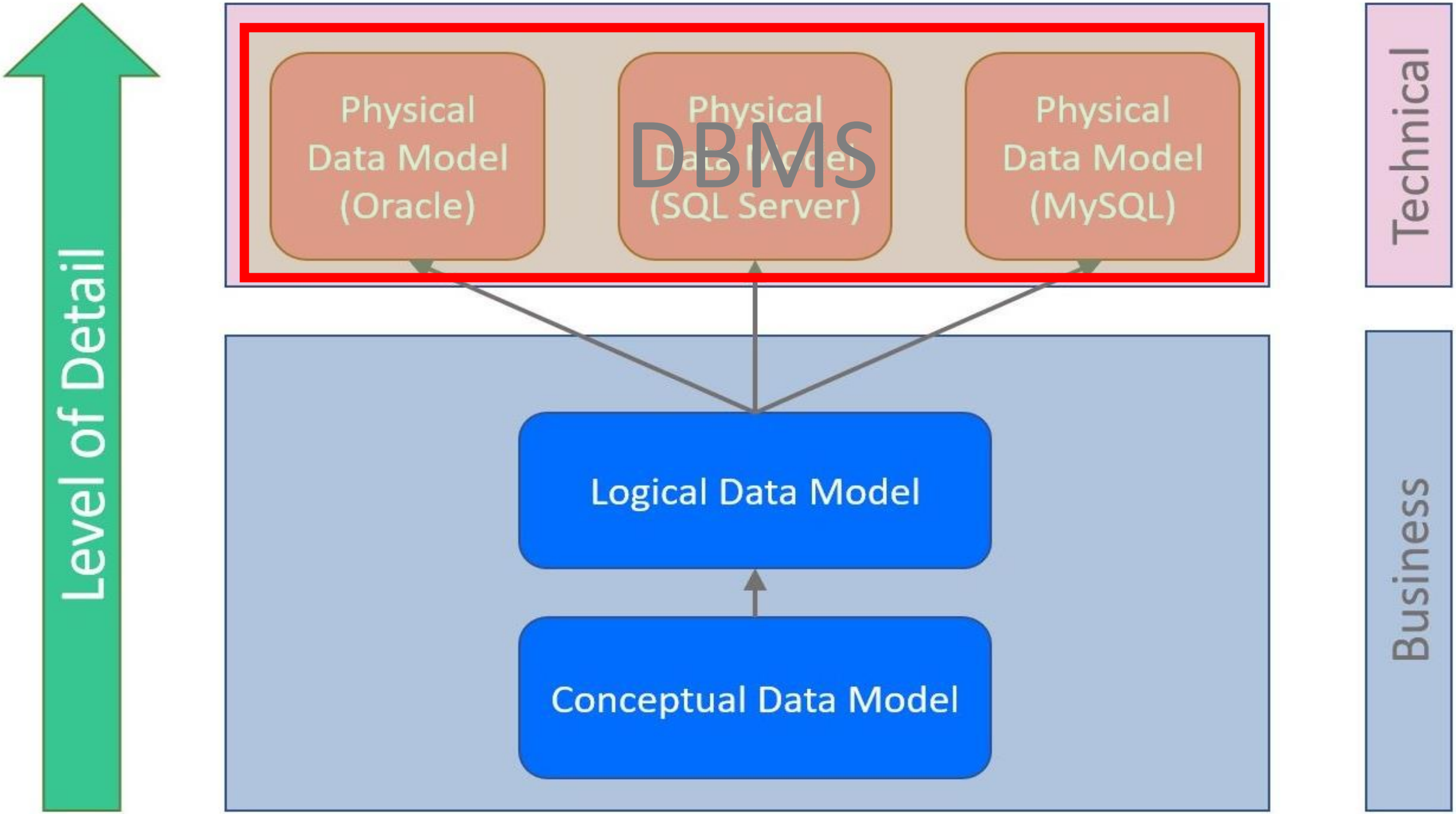
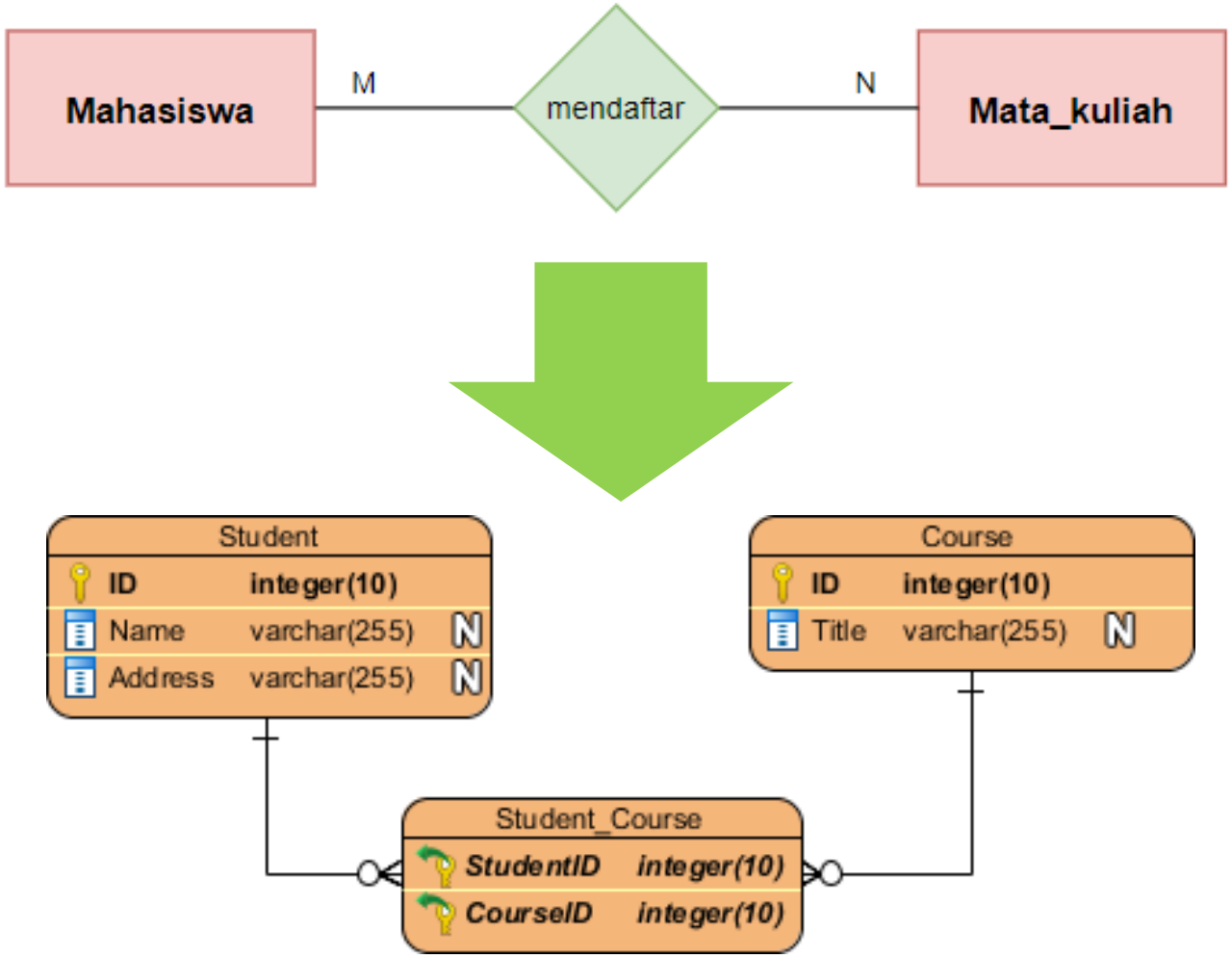

Level of Detail
Physical Data Model (Oracle)
Physical Data Model (SQL Server)
Physical Data Model (MySQL)
DBMS
Technical
Logical Data Model
Conceptual Data Model
Business

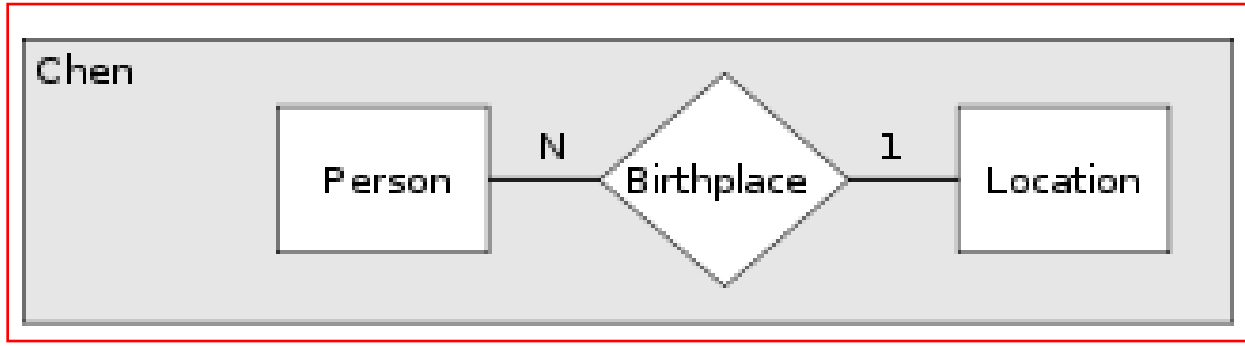
Diagram dalam Tahapan Pemodelan Data

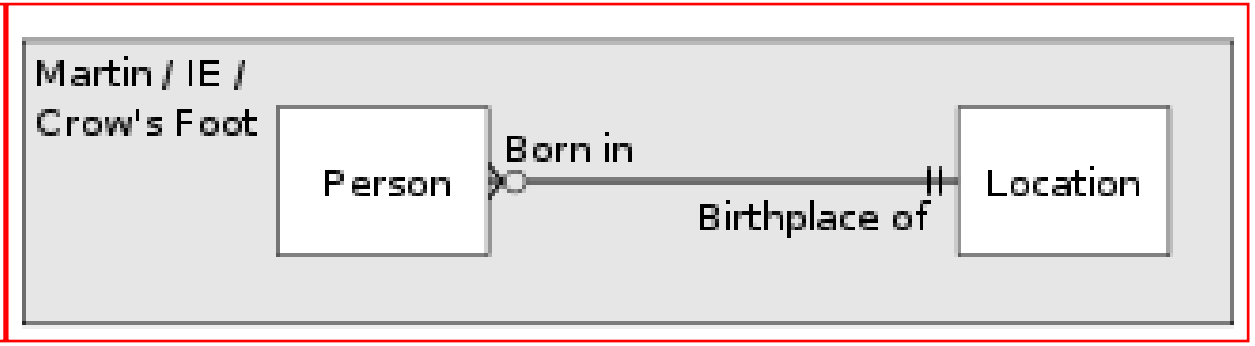


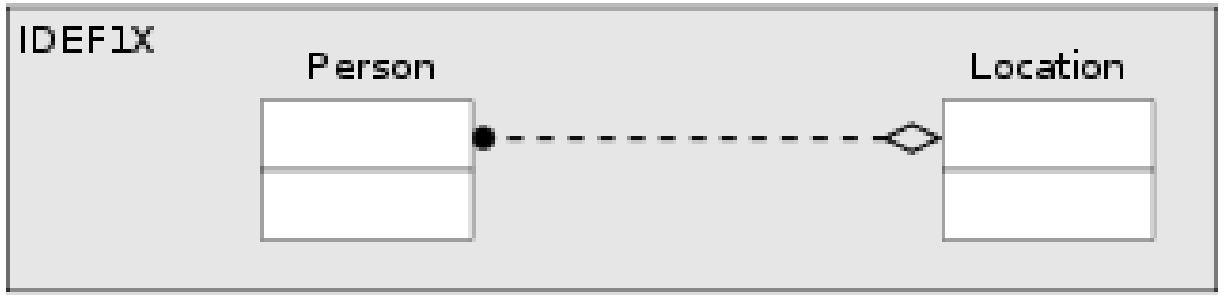
Konseptual/Logical
(Notasi Chen)

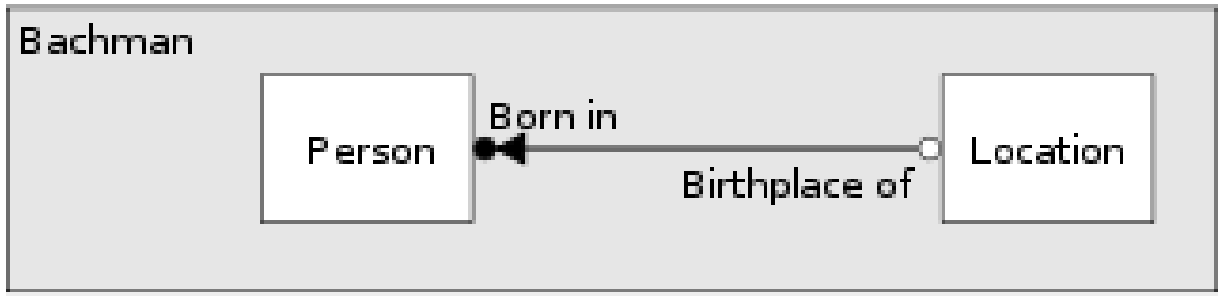
Physical
(Notasi Crow's Foot)

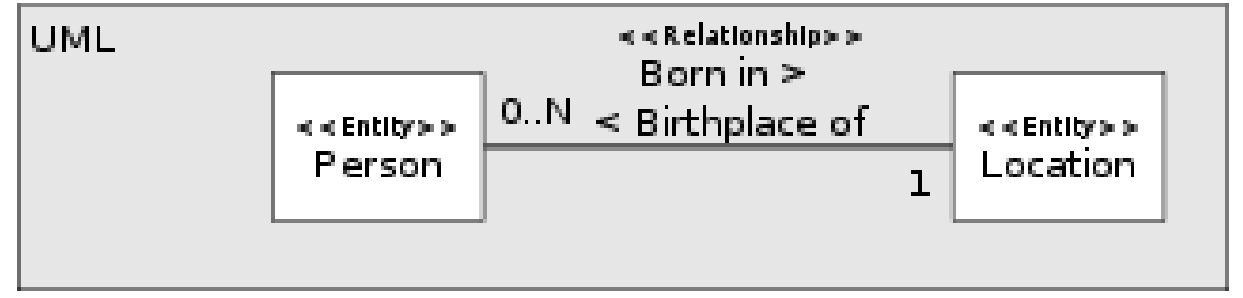
Beberapa Notasi Diagram





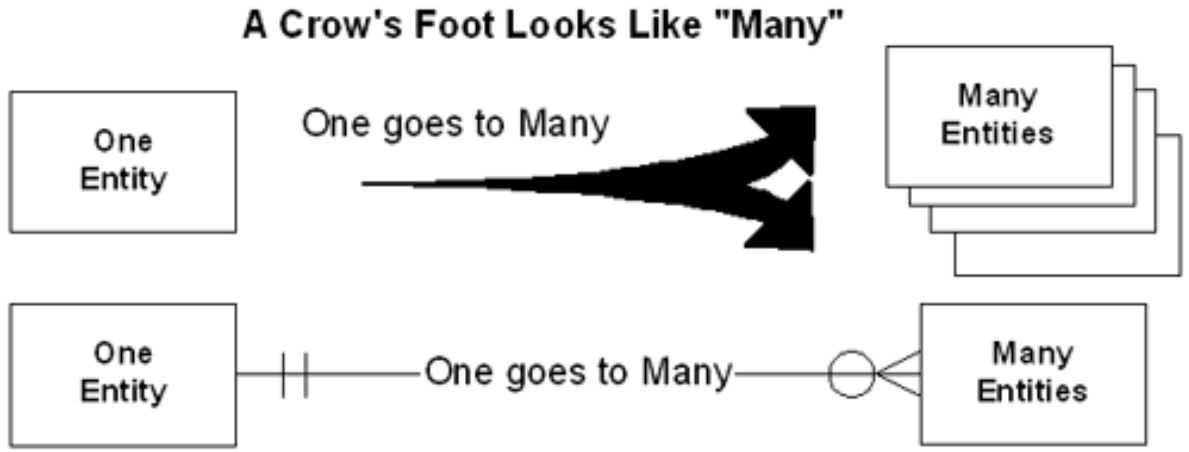


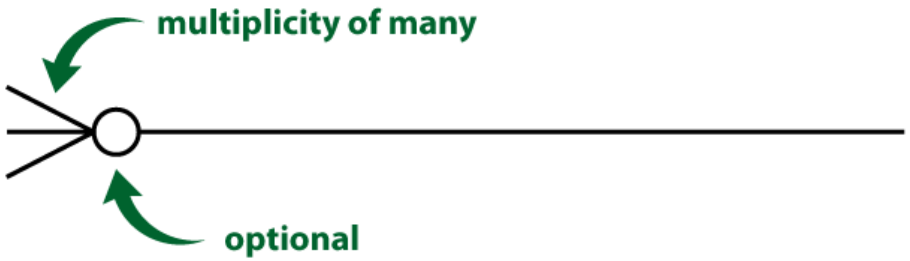


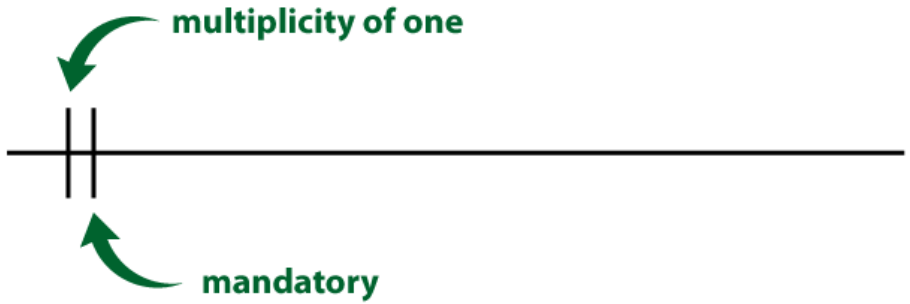


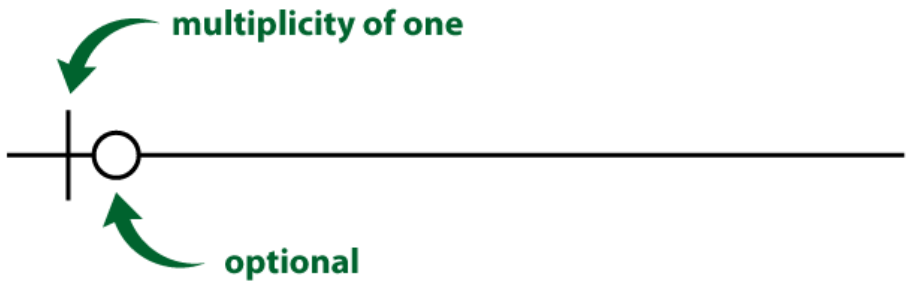
Notasi Crow's Foot

('Kaki Gagak')



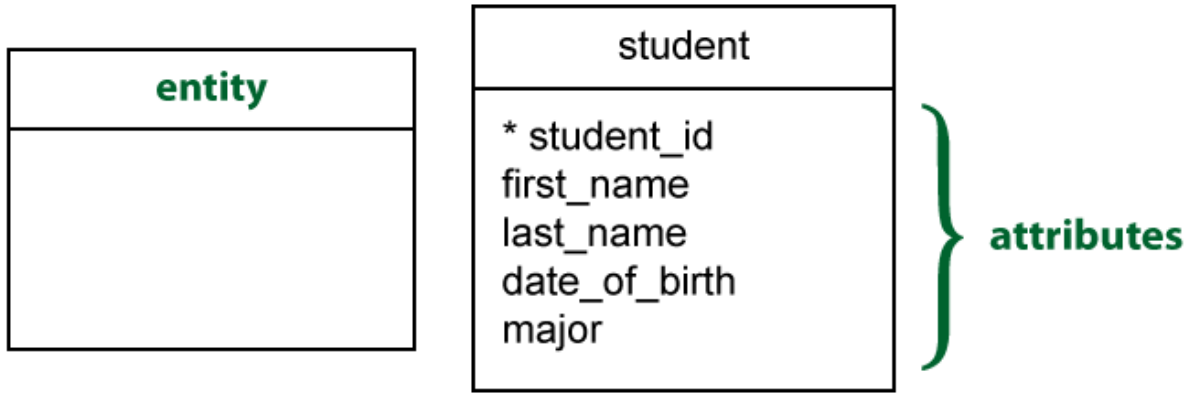


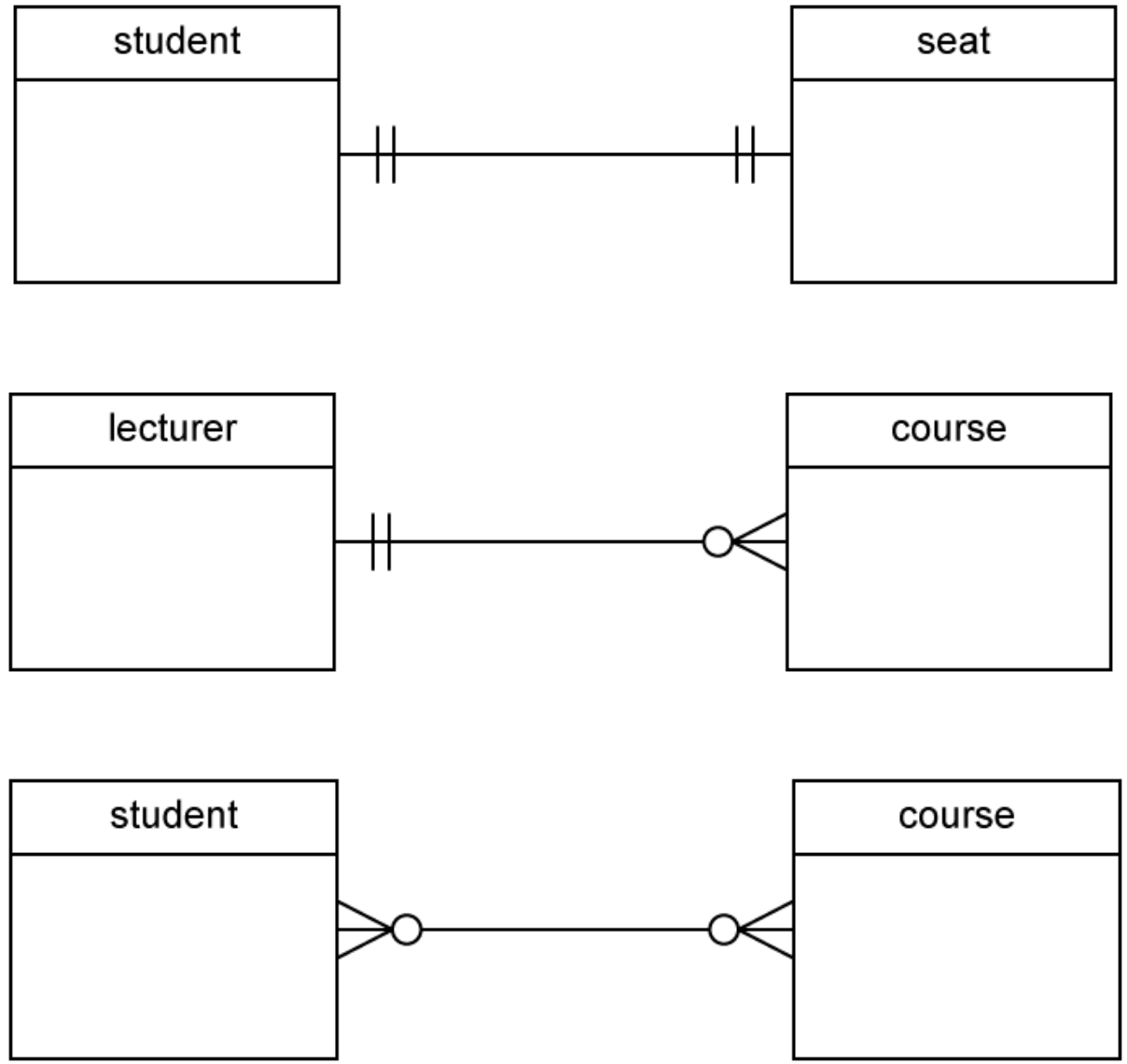




https://www.vertabelo.com/blog/crow-s-foot-notation/

Notasi Crow's Foot



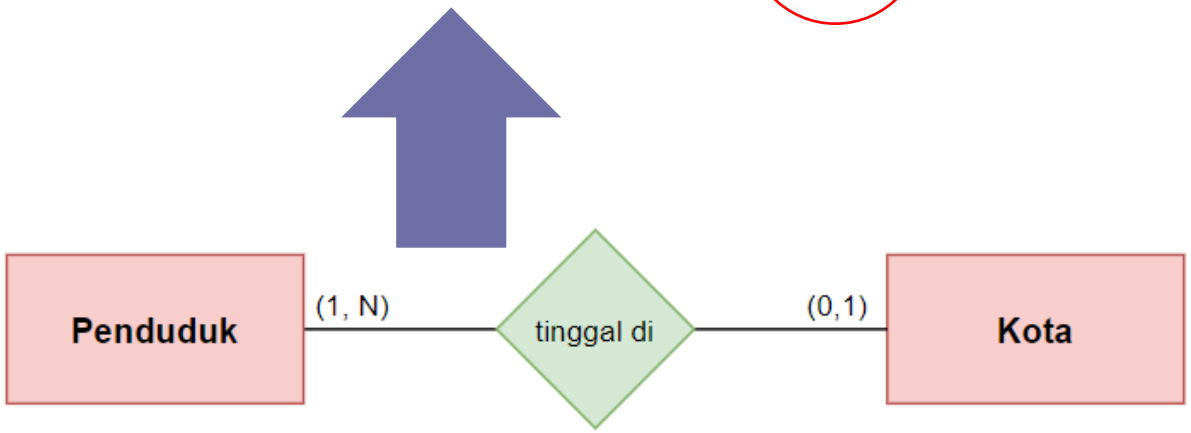


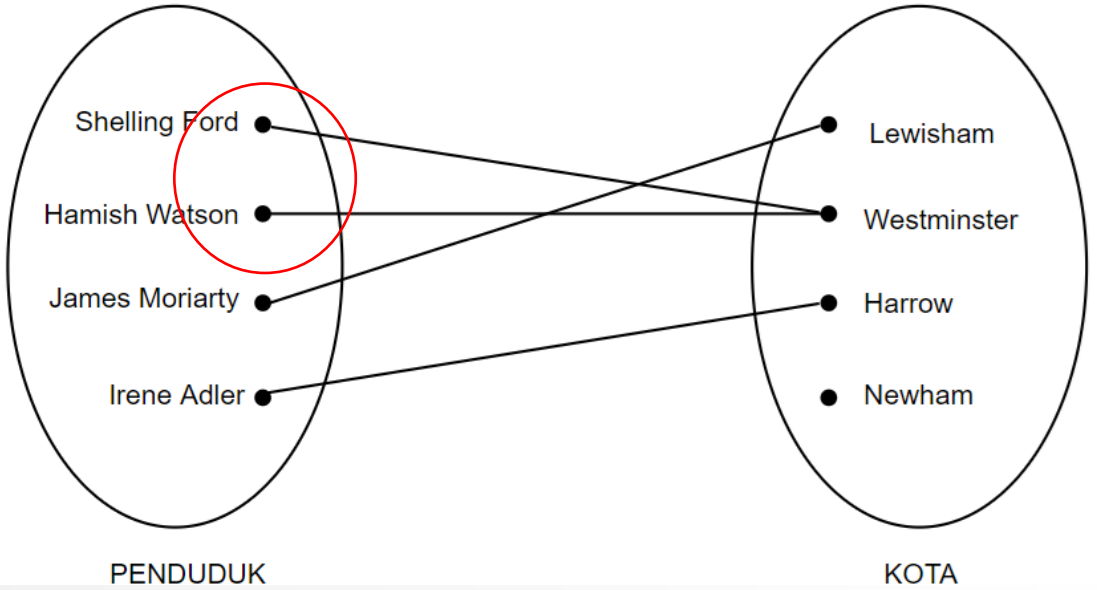
Notasi Crow's Foot juga memiliki berbagai variasi, misalnya model Baker dan IE. Meskipun demikian, secara garis besar terdapat konsistensi pada notasi seperti pada gambar

Notasi Crow's Foot

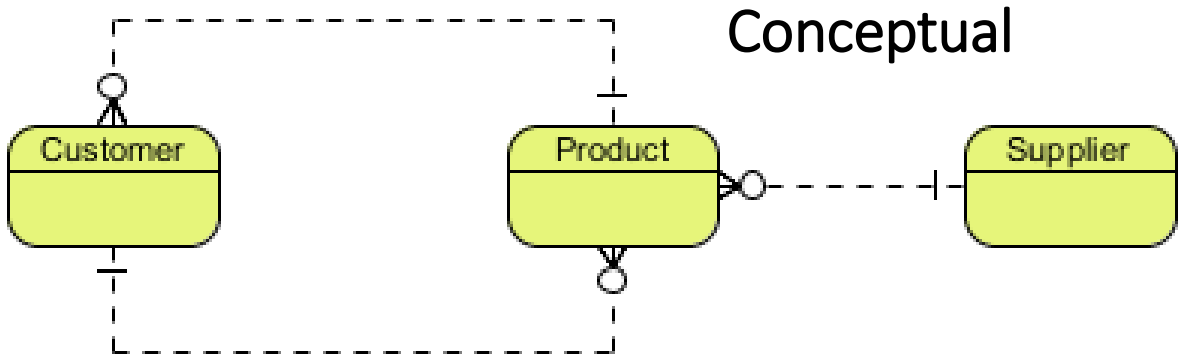
Penduduk	
PK	No_KTP varchar(10) NOT NULL
	Nama_Lengkap varchar(30) NOT NULL
	No_HP varchar(15)
	Alamat_Lengkap varchar(50)
	Pekerjaan varchar(30)
FK	*id_Kota int(6) NOT NULL*

Kota	
PK	id_Kota int(6) NOT NULL
	Nama_Kota varchar(30) NOT NULL
	Jumlah_penduduk int(7)
	Walikota varchar(30)



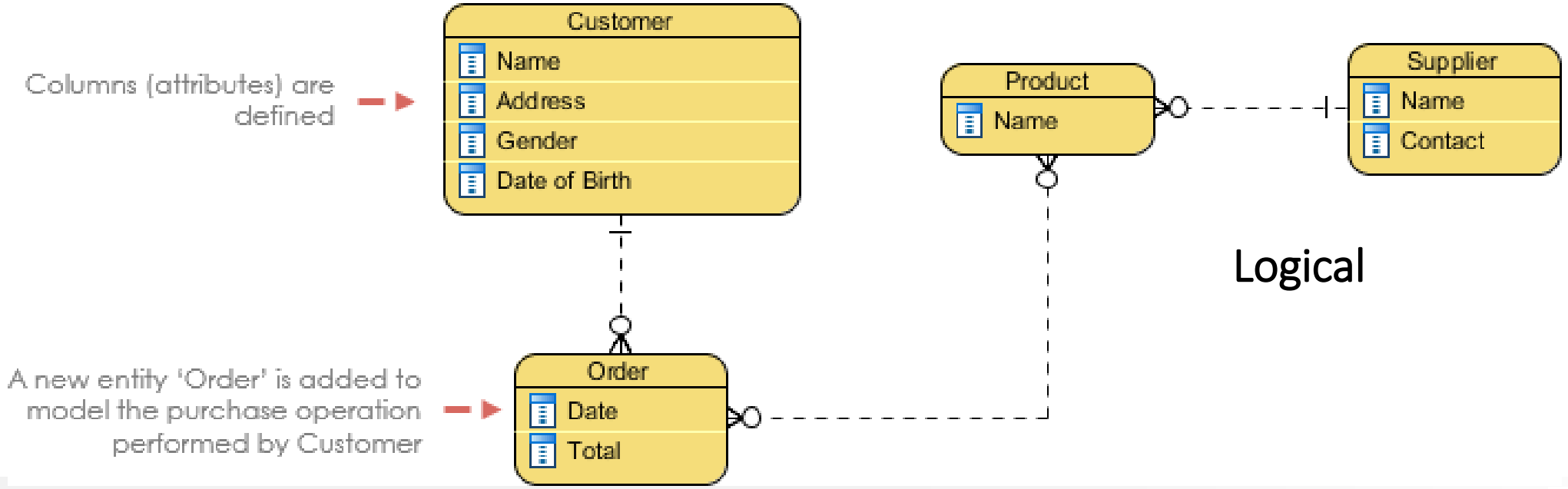


ERD ke Relational Model

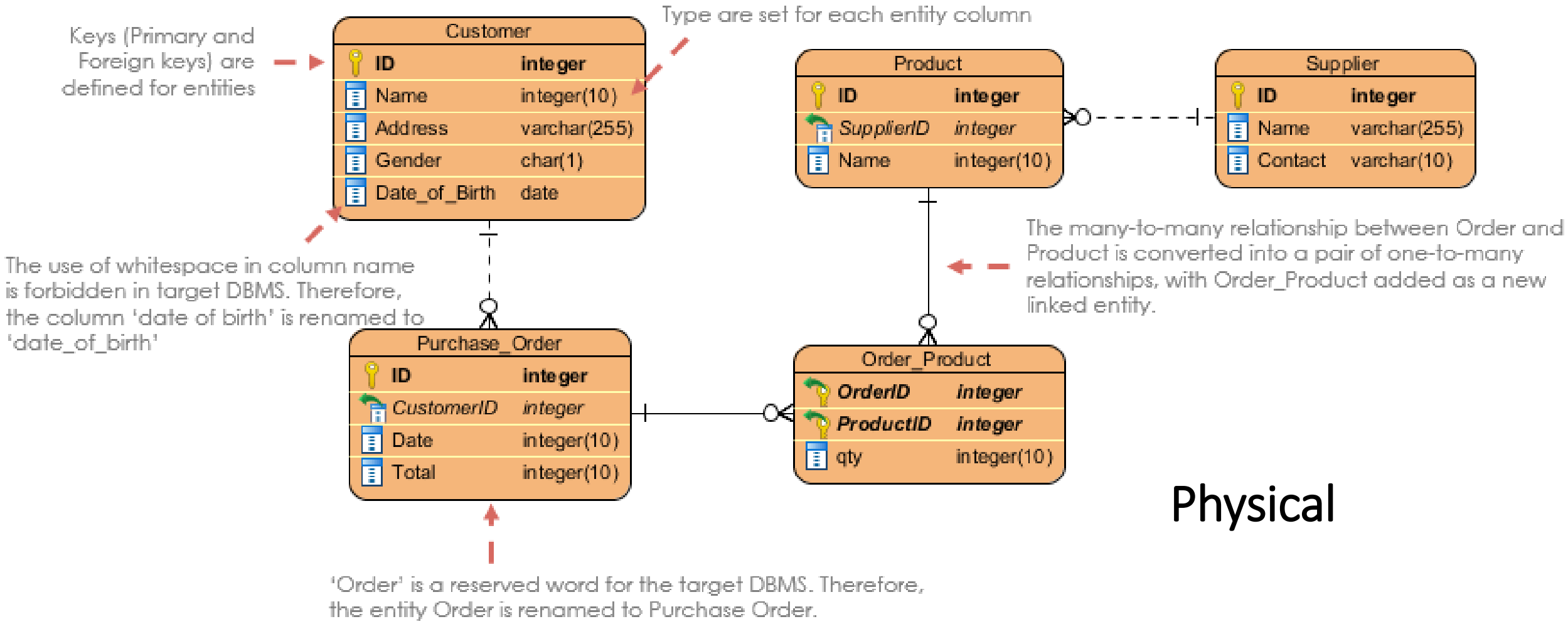


Notasi Crow's Foot dapat digunakan untuk **pemodelan Konseptual, Logical maupun Physical**

Konversi dari tahapan konseptual ke logical dan ke physical dapat dilakukan melalui beberapa cara

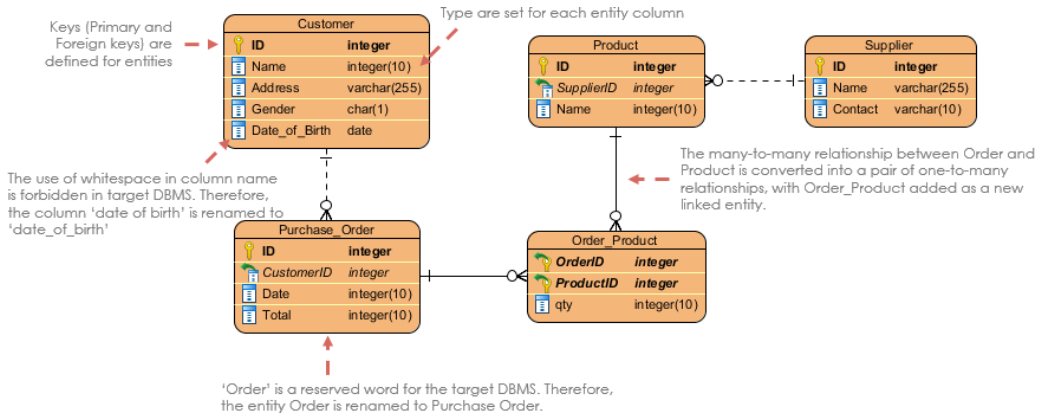


ERD ke Relational Model



Physical

ERD ke Relational Model

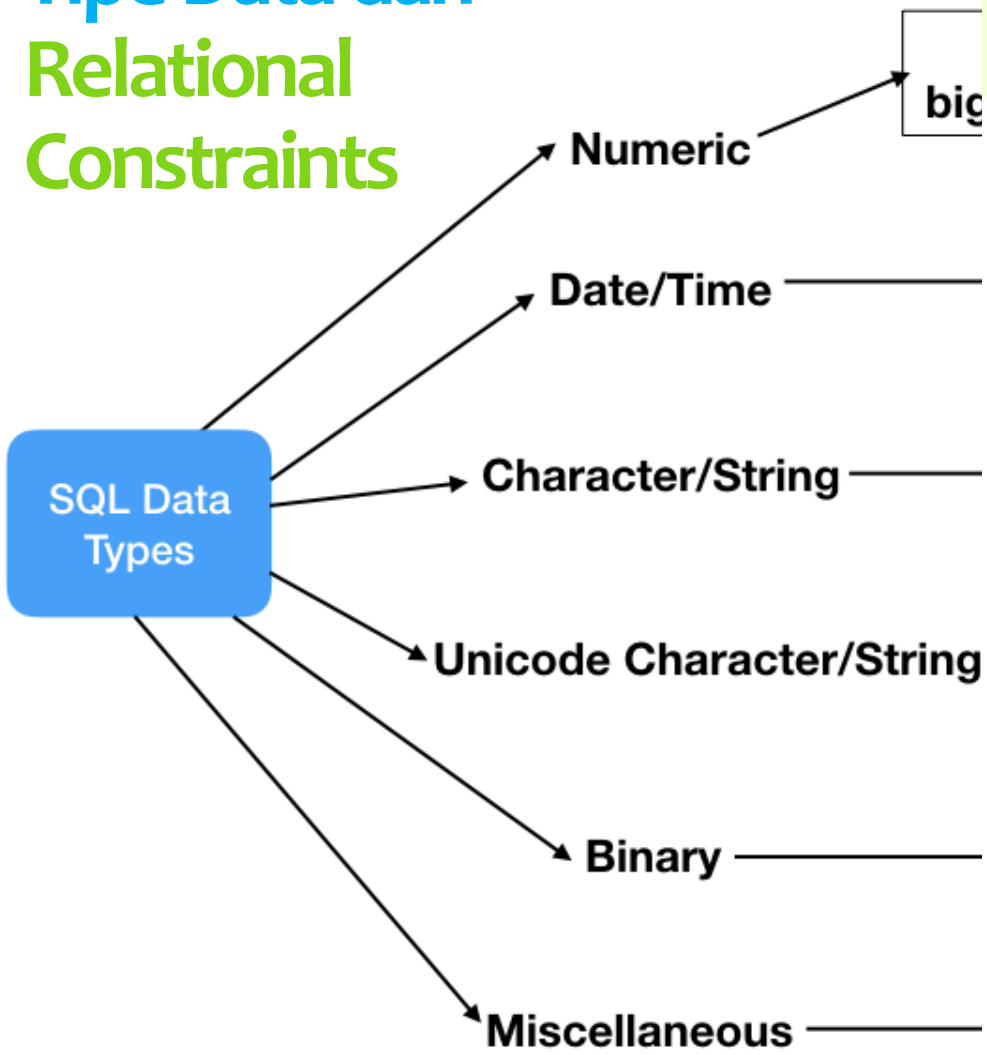



```sql
-- SELECT
SELECT *
FROM employee

-- INSERT
INSERT INTO employee(emp_id, fname, minit, lname,
                     job_id, job_lvl, pub_id, hire_date)
            VALUES('0000000', 'Almir', 'M', 'Vuk',
                     7, 12, 1207, 2009-05-09)

-- UPDATE
UPDATE employee
SET fname = 'ALMIR'
WHERE emp_id = '0000000'

-- DELETE
DELETE
FROM employee
WHERE emp_id = '0000000'
```

Model fisik inilah yang akan diterjemahkan menjadi perintah dalam Bahasa SQL dalam perangkat Basisdata

Dalam pemodelan fisik (Physical), tiap Perangkat Lunak Manajemen Basisdata (DBMS) mungkin memiliki implementasi notasi dan tipe data yang berbeda-beda

Tipe Data dan Relational Constraints



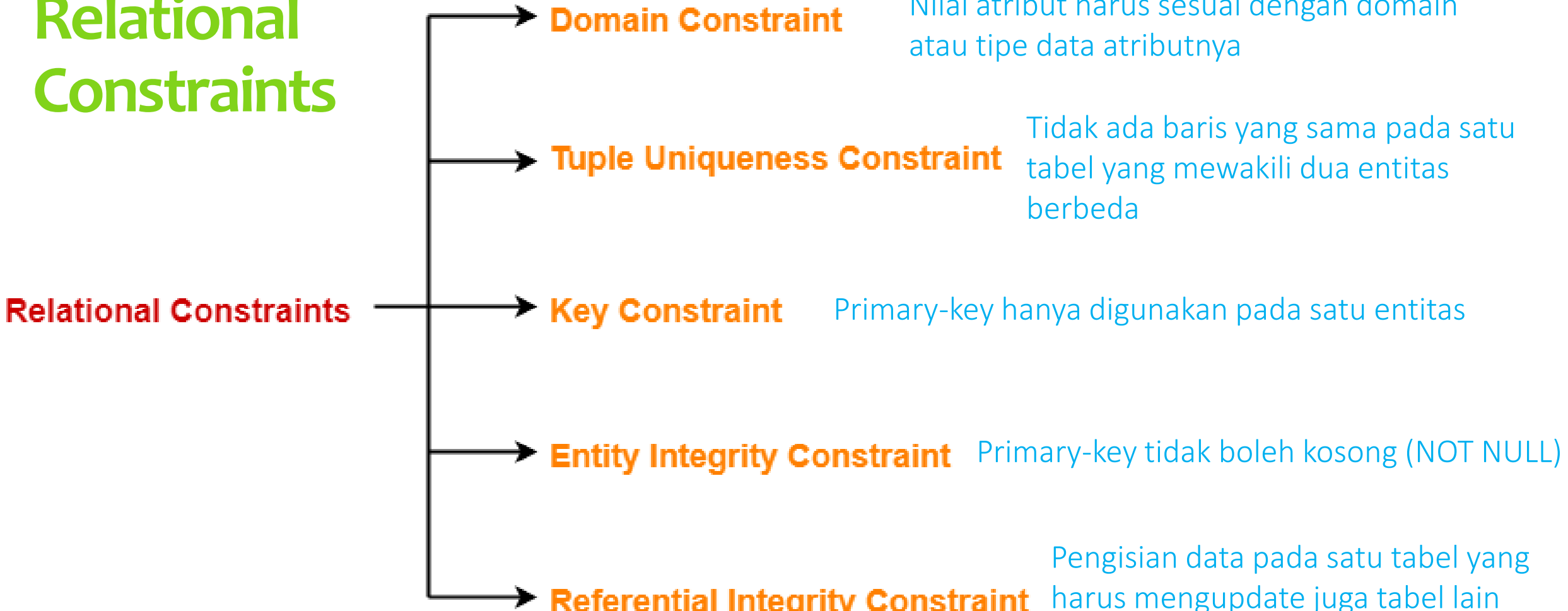
Implementasi di tiap DBMS bisa berbeda-beda

COMPARISON OF DATA TYPE

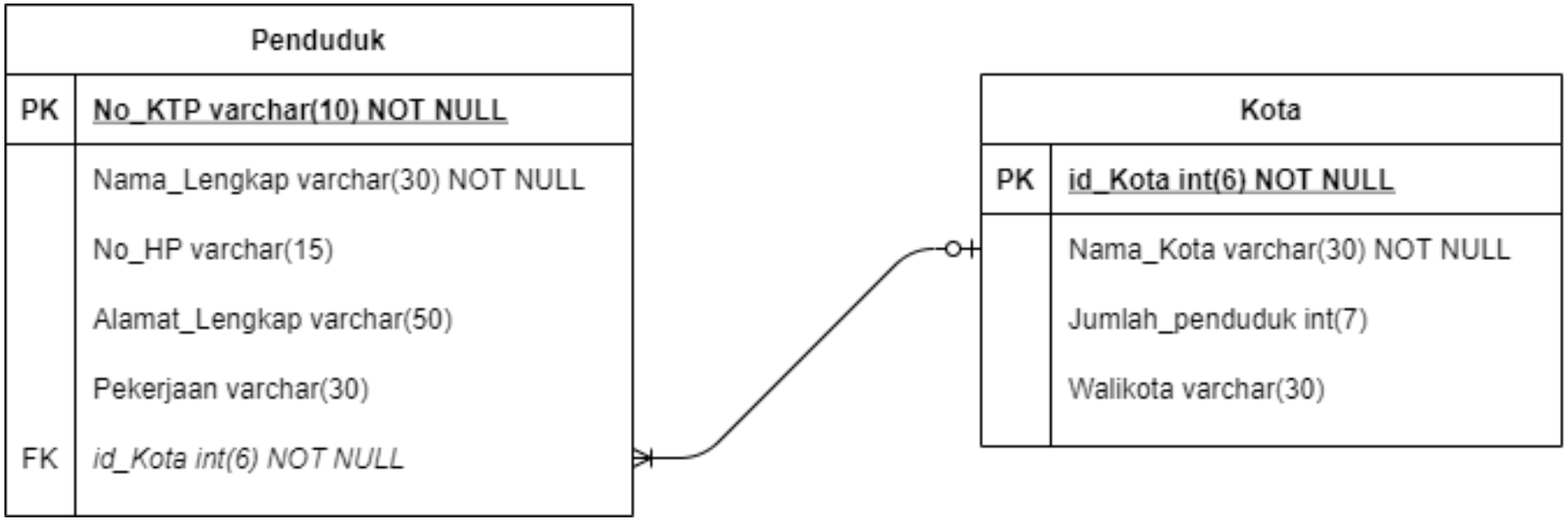
ezis

	Oracle	PostgreSQL	MySQL	MariaDB
EXACT NUMERIC	INTEGER NUMBER NUMERIC SMALLINT DECIMA	INTEGER DECIMAL, INT2 INT4, INT8 NUMERIC, SERIAL	INTEGER TINYINT SMALLINT MEDIUMINT INT, BIGINT DECIMAL NUMERIC	INTEGER SMALLINT MEDIUMINT INT, BIGINT DECIMAL NUMERIC
APPROXIMATE NUMERIC	FLOAT, REAL DOUBLE PRECISION	FLOAT, REAL DOUBLE PRECISION FLOAT4, FLOAT8	FLOAT, REAL DOUBLE PRECISION	FLOAT, REAL DOUBLE PRECISION
CHARACTER	CHAR, VARCHAR2, NVARCHAR2, LONG, TEXT ENUM, SET	CHAR, VARCHAR TEXT, NAME CHARACTER	CHAR, VARCHAR TINYBLOB, BLOB, MEDIUMBLOB LONGBLOB TINYTEXT TEXT, MEDIUMTEXT LONGTEXT ENUM, SET	CHAR, VARCHAR TINYBLOB, BLOB, MEDIUMBLOB LONGBLOB TINYTEXT TEXT, MEDIUMTEXT LONGTEXT ENUM, SET
DATETIME	DATE, TIME DATETIME TIMESTAMP, YEAR	DATE, TIME TIMETZ, TIMESTAMP CURRENT, EPOCH, INFINITY INVALID, NOW TODAY, TOMORROW YESTERDAY	DATE, TIME DATETIME TIMESTAMP, YEAR	DATE, TIME DATETIME TIMESTAMP, YEAR
BOOLEAN		BOOL	TINYINT	TINYINT

Tipe Data dan Relational Constraints

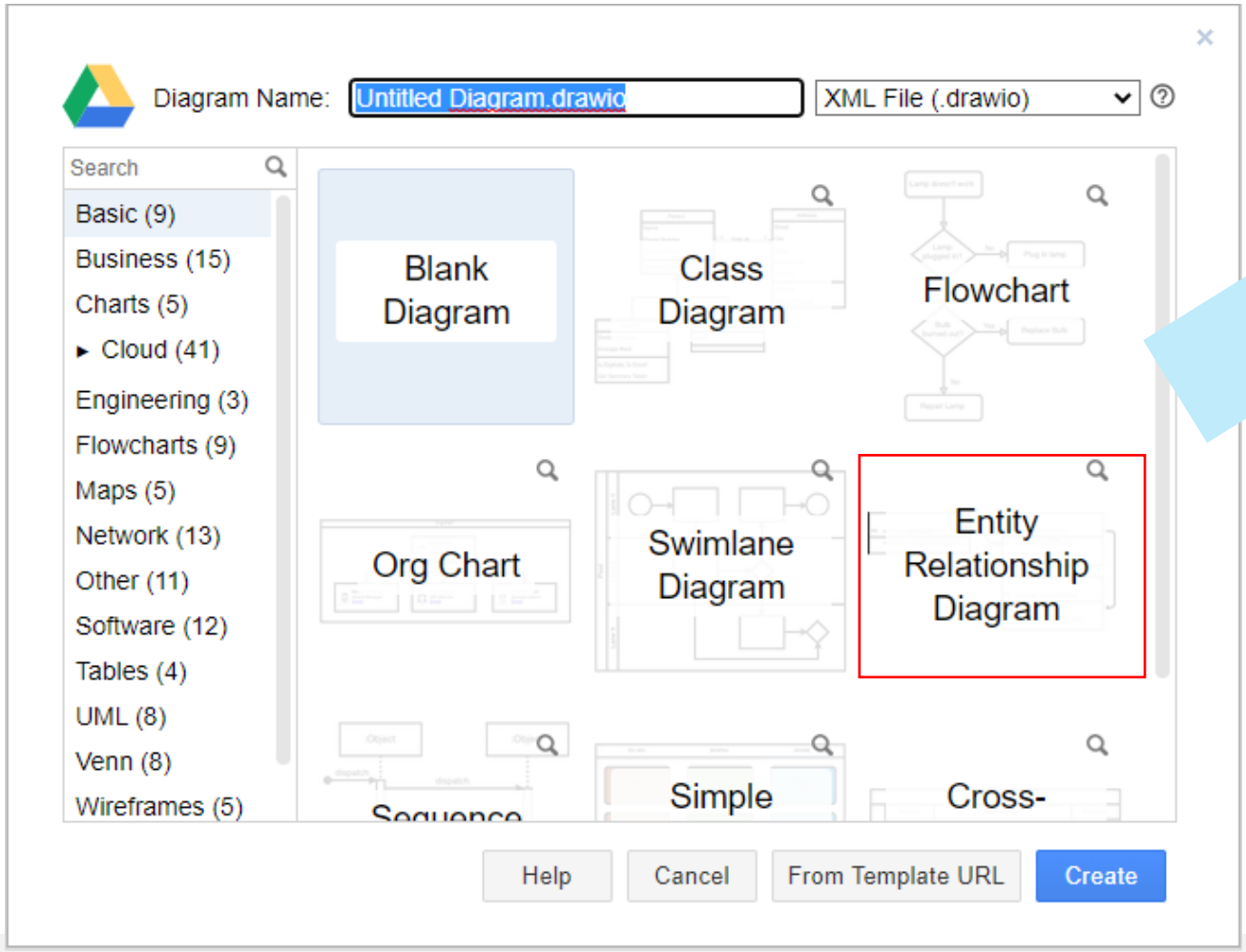


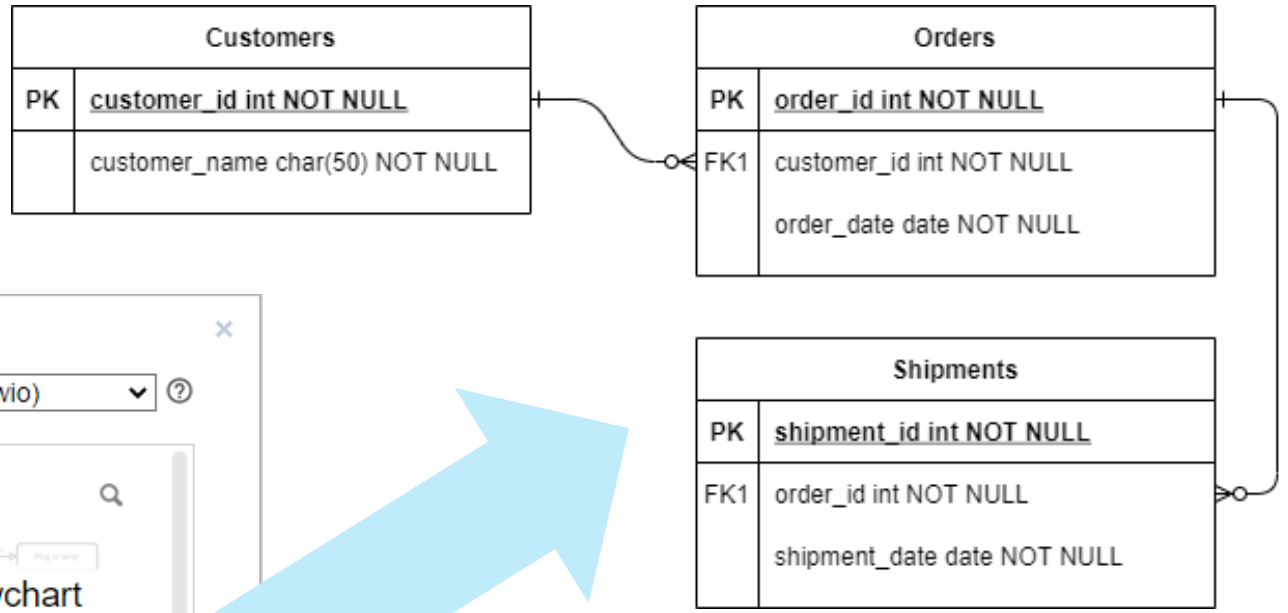
Penggambaran Notasi
Crow's Foot



Apakah desain di atas sudah memenuhi semua **relational constraints**?

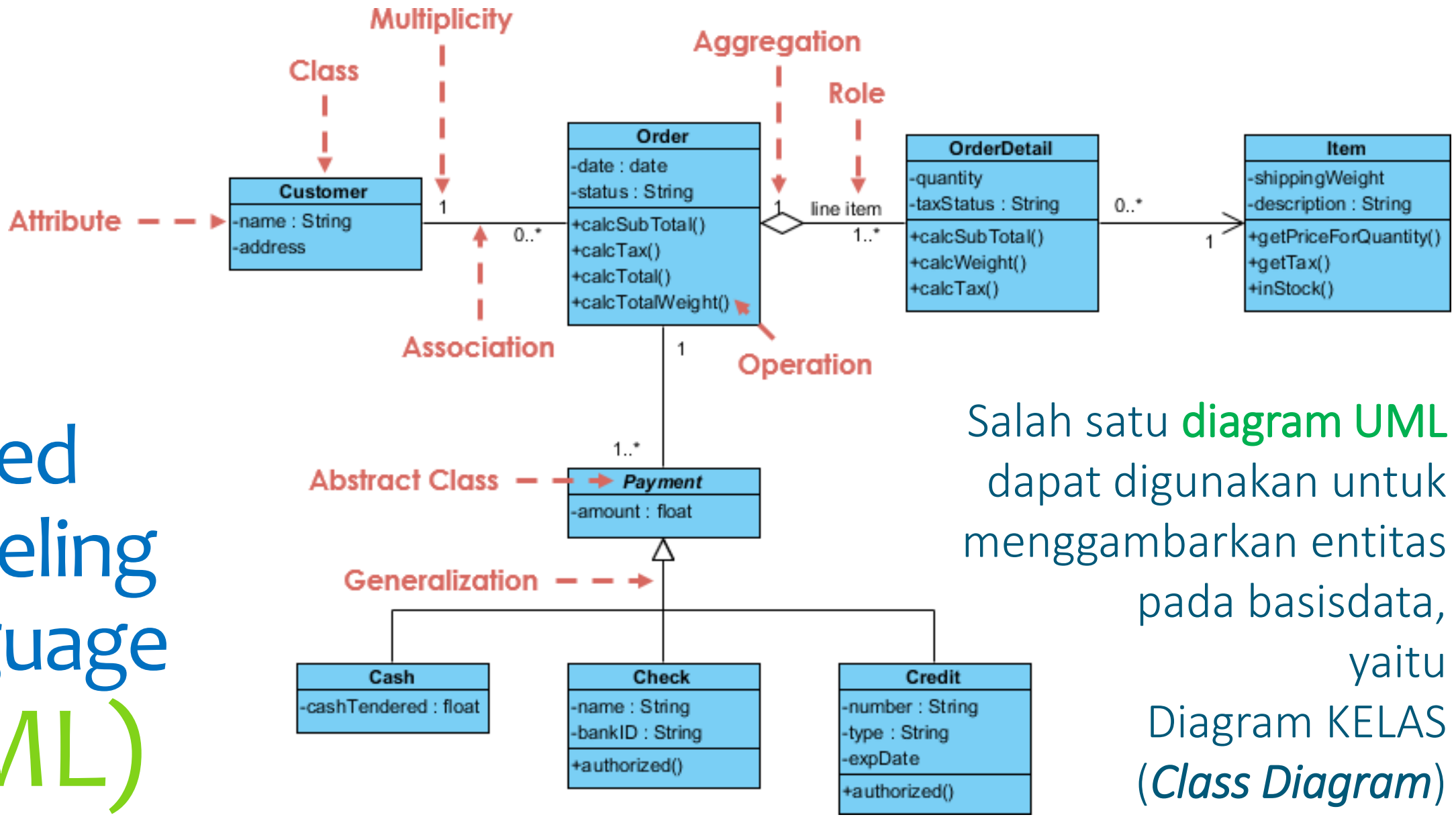
https://www.youtube.com/watch?v=lAtCySGDD48





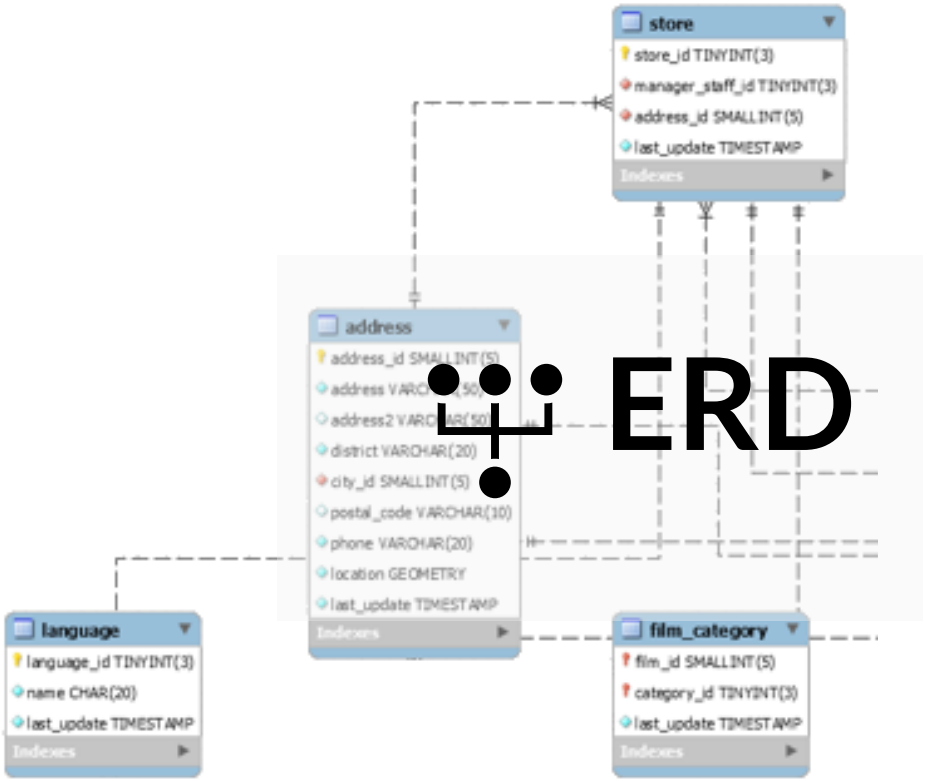
Penggambaran Notasi Crow's Foot

Unified Modeling Language (UML)



Salah satu **diagram UML** dapat digunakan untuk menggambarkan entitas pada basisdata, yaitu Diagram KELAS (*Class Diagram*)

Berbagai perangkat DBMS memiliki kemampuan untuk *Forward Engineering* dan *Backward Engineering*



Forward-Engineering

Backward-Engineering


```
CREATE SCHEMA IF NOT EXISTS `sakila` DEFAULT CHARACTER SET latin1 ;
USE `sakila` ;

-- -----------------------------------------------------
-- Table `sakila`.`actor`
-- -----------------------------------------------------
CREATE TABLE IF NOT EXISTS `sakila`.`actor` (
  `actor_id` SMALLINT(5) UNSIGNED NOT NULL AUTO_INCREMENT,
  `first_name` VARCHAR(45) NOT NULL,
  `last_name` VARCHAR(45) NOT NULL,
  `last_update` TIMESTAMP NOT NULL,
  PRIMARY KEY (`actor_id`),
  INDEX `idx_actor_last_name` (`last_name` ASC))
ENGINE = InnoDB
R SET = utf8;

`.`country`

NOT EXISTS `sa`.`country` (
SMALLINT(5) UNSIGNED NOT NULL AUTO_INCREMENT,
CHAR(50) NOT NULL,
TIMESTAMP NOT NULL,
`country_id`))

R SET = utf8;

-- -----------------------------------------------------
-- Table `sakila`.`city`
-- -----------------------------------------------------
CREATE TABLE IF NOT EXISTS `sakila`.`city` (
  `city_id` SMALLINT(5) UNSIGNED NOT NULL AUTO_INCREMENT,
  `city` VARCHAR(50) NOT NULL,
  `country_id` SMALLINT(5) UNSIGNED NOT NULL,
  `last_update` TIMESTAMP NOT NULL,
  PRIMARY KEY (`city_id`),
  INDEX `idx_fk_country_id` (`country_id` ASC),
```

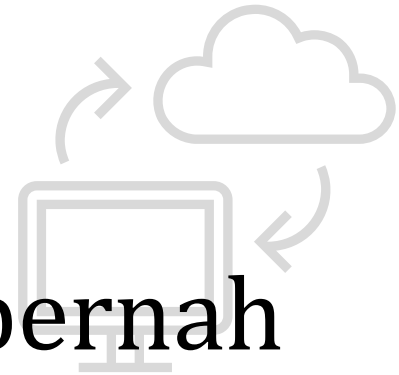
Forward Engineering dan Backward Engineering

Penggambaran Notasi Diagram Fisik Dengan Crow's Foot

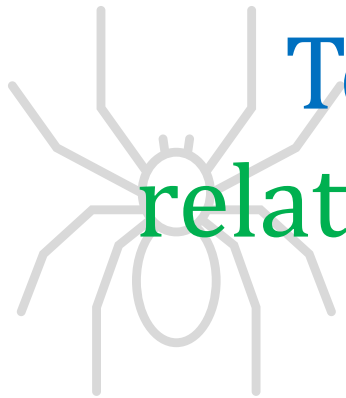
https://s.id/ERDLucidChart1

https://s.id/ERDLucidChart2

Tugas Praktikum MANDIRI



Lakukan konversi model ERD yang pernah dibuat menjadi model fisik dalam bentuk diagram dengan notasi Crow's Foot



Tentukan juga tipe data tiap atribut dan relational constraints untuk tiap definisi Tabel

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