

Microsoft  
SQL Server  
Training for  
Developer



Microsoft®  
**SQL Server**®

**Pusat Geospasial Negara**

15 – 16 May 2024

# What is Data , DBMS and MSSQL

What?

Database are used to store and manage large amounts of data. DBMS help in retrieving data and manipulating it and then representing the data.



Today, almost every organization has morphed itself into a data-driven organization.



This has a **direct impact** on organization's strategic, tactical and operational **business decisions**



## **What is a SQL Server application?**

Microsoft SQL Server is a relational database management system developed by Microsoft. It is a software product with the primary function of storing and retrieving data as requested by other software applications

## **What is a SQL database administrator (dba)?**

The primary responsibility of the dba is to manage databases, configure server, install application, control permissions, backup and restore databases, ensure security of server, provide high availability solutions for redundancy of data and much more

# Installation

## Editions:

- **Express**
  - Up to 10GB database size
  - 1.4 GB Memory limit
  - Single CPU
- **Developer**
  - All of enterprise
  - Not for production but for dev.
- **Trial**
  - Ent. Edition but limit to 2 months
- **Azure**
  - Cloud solution (future)
- **Standard**
  - For smaller scale app.
- **Enterprise**
  - For large scale app.
- **Linux**
  - Since ver. 2017
- **Docker**
  - Since ver. 2017

## Components:

- Database Engine
- Analysis Service
  - 3 dimensional cube
- Integration Service (SSIS)
  - ETL
- Reporting Service
  - Show report on web
  - Pdf, excel
- Master Data Service
  - Reference data across db
- **Machine Learning Service**
  - In database
  - Standalone
  - R & Python (panda, pi)
- Management Studio (SSMS)
- Visual Studio

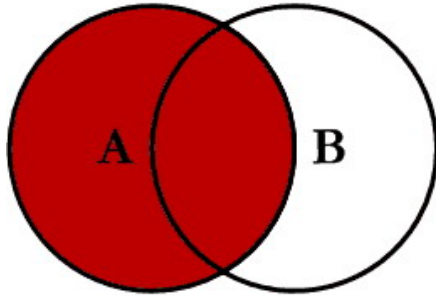
## Version:

- 6.0
- **6.5 -> year 2000**
- 7.0
- 2000 (8.0)
- 2005 (9.0)
- 2008 (10.0)
- 2012 (11.0)
- 2014 (12.0)
- 2016 (13.0)
- 2017 (14.0)
- 2019 (15.0)
- **2022 (16.0)**

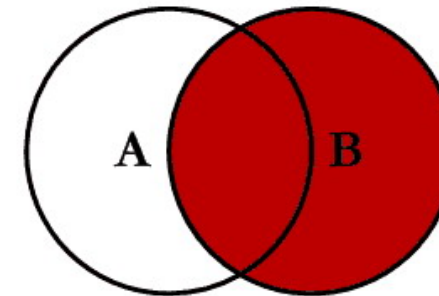
# Jenis2 DB

- RDBMS (**MSSQL**, Oracle, Informix, MySQL, ...)
  - T-SQL. ANSI
- NoSQL (MongoDB, Cassandra, Solr)
- Graph Database (Hbase)
- Embedded DB (SQLite)
- OOP DB (Derby)
- Cloud DB (Google Firestore), Azure Cloud

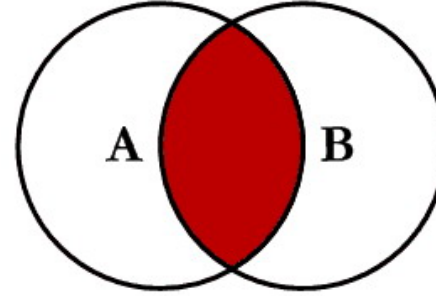
# SQL JOINS



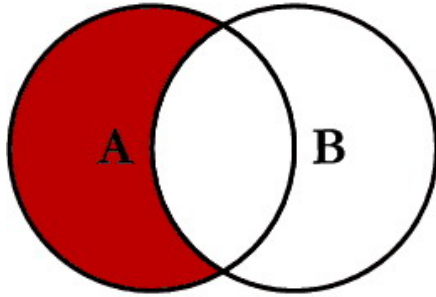
```
SELECT <select_list>  
FROM TableA A  
LEFT JOIN TableB B  
ON A.Key = B.Key
```



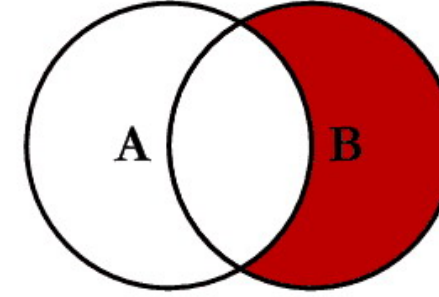
```
SELECT <select_list>  
FROM TableA A  
RIGHT JOIN TableB B  
ON A.Key = B.Key
```



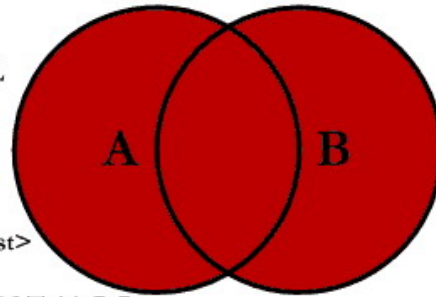
```
SELECT <select_list>  
FROM TableA A  
INNER JOIN TableB B  
ON A.Key = B.Key
```



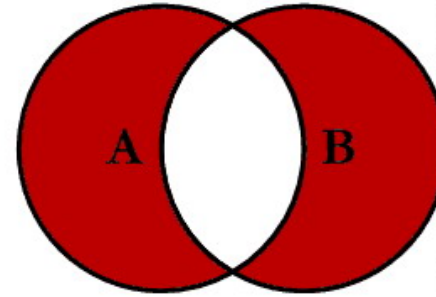
```
SELECT <select_list>  
FROM TableA A  
LEFT JOIN TableB B  
ON A.Key = B.Key  
WHERE B.Key IS NULL
```



```
SELECT <select_list>  
FROM TableA A  
RIGHT JOIN TableB B  
ON A.Key = B.Key  
WHERE A.Key IS NULL
```

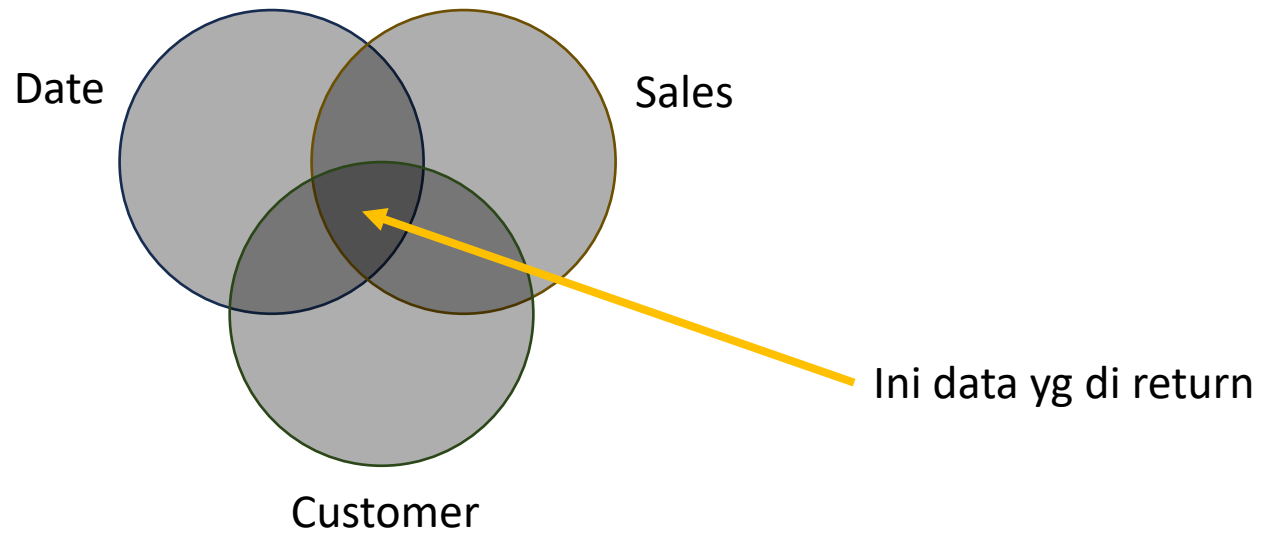
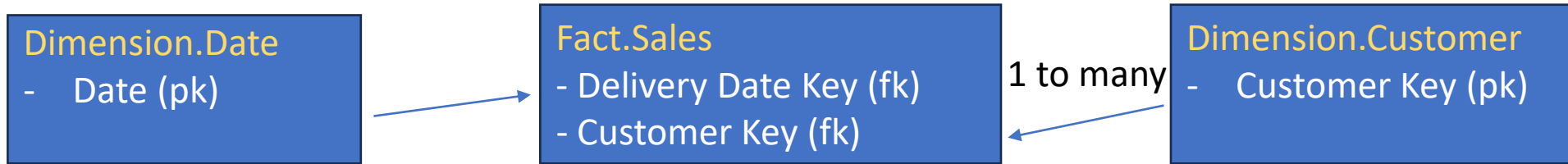


```
SELECT <select_list>  
FROM TableA A  
FULL OUTER JOIN TableB B  
ON A.Key = B.Key
```

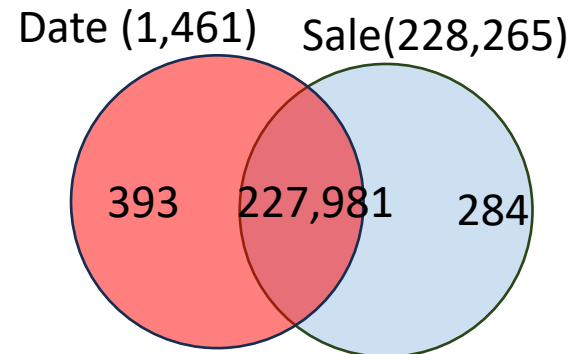
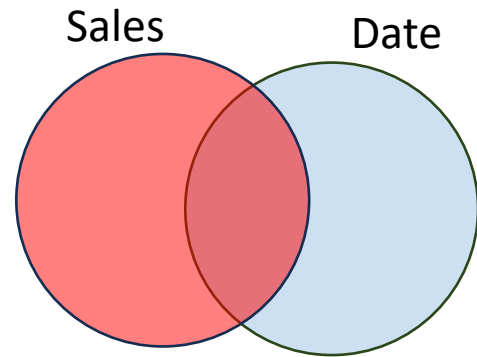


```
SELECT <select_list>  
FROM TableA A  
FULL OUTER JOIN TableB B  
ON A.Key = B.Key  
WHERE A.Key IS NULL  
OR B.Key IS NULL
```

# ER Diagram



## LEFT OUTER JOIN



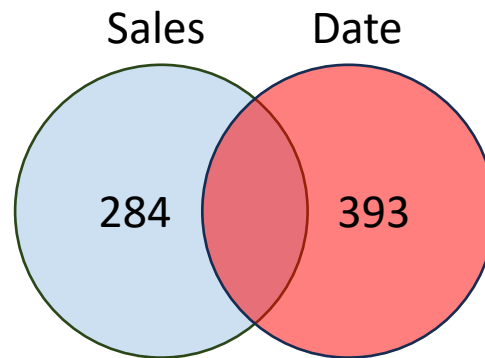
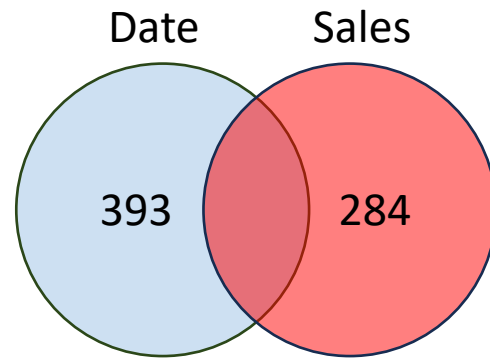
$$\text{Full outer join} = (393 + 227,981 + 282) = 228,658$$

$$\text{Anti Full outer join} = (393 + 284) = 677$$

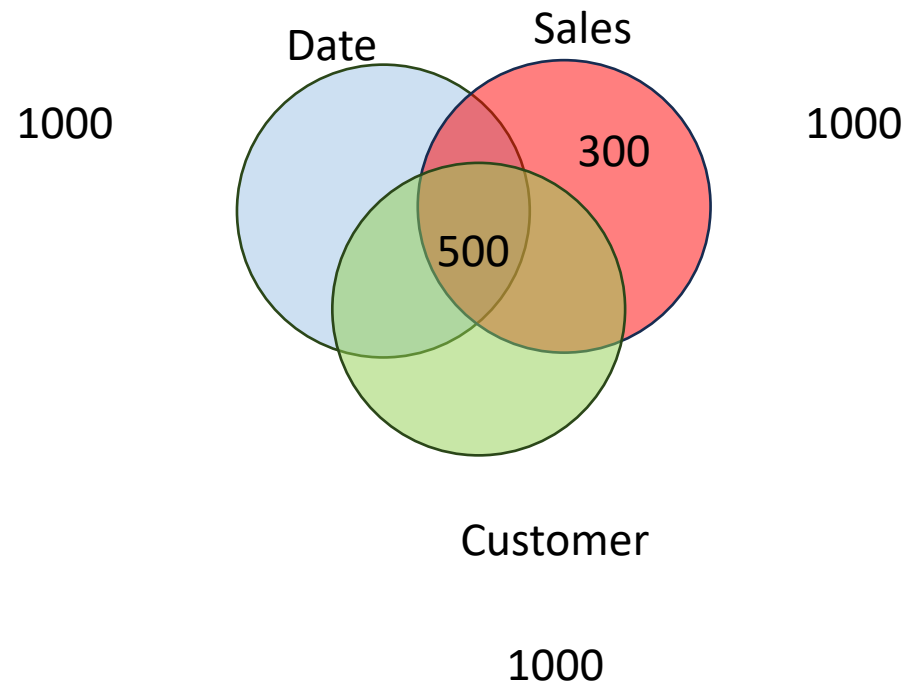
Semua yg match antara Date dan Sales + yg x match dalam Date



## RIGHT OUTER JOIN



## INNER + LEFT OUTER JOIN



Result Akhir = 800 rekod

# Revision Day #

- Introduction
- T-SQL: 1. DML, 2. DDL
- SELECT [column] FROM .. WHERE... GROUP BY, ORDER BY DESC/ASC
- Join. 7 jenis join.. Left join, right join, anti left/right, full
- Month(), year(), getdate(), min(), max(), sum(), count(),
- Having

# Day #2

- View
- Stored Procedure
- User defined function
- Trigger
- Spatial, JSON
- R dan Python

Sbo.SimpleOrders  
- OrderId (pk)



Dbo.SimpleOrderDetails  
- ..  
- OrderId(fk)