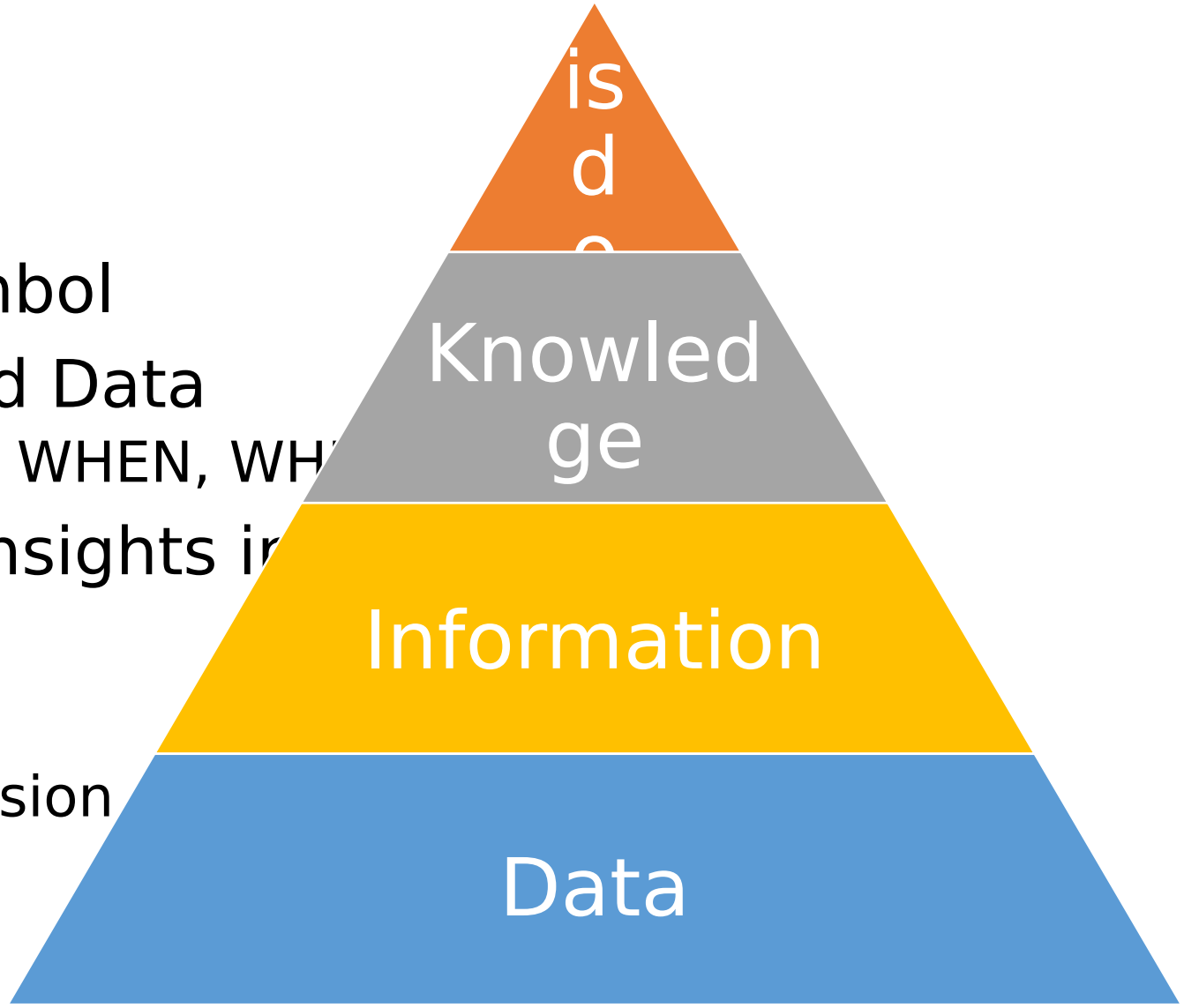
# Database and Spatial Database

Lab - Feb 08, 2024

# DIKW Pyramid

- Data as fact, signal, symbol
- Information as Processed Data
  - Can answer WHO, WHAT, WHEN, WH
- Knowledge as pattern, insights ir
  - Can answer HOW
- Wisdom as conclusion
  - Can answer WHY for decision




https://en.wikipedia.org/wiki/DIKW_pyramid

# Types of Databases

- Relational Databases
  - Purpose : Transactions (Structured)
  - Also known as OLTP (On-Line Transaction Processing)
- Data Warehouse
  - Purpose : Read-only Dashboards and Reports (Structured)
  - Also known as OLAP (On-Line Analytical Processing)
- NoSQL Databases
  - Purpose : Huge data processing (Unstructured or semi-structured)
  - Big Data concepts

# Relational Databases – ACID Properties

- Atomicity
  - Each transaction is atomic in nature
  - Each transaction consists of multiple statements
- Consistency
  - At any moment database must be consistent
  - In terms on all constraints must be followed
- Isolation
  - Each transaction executes in isolation, through many transactions are being executed in parallel
- Durability
  - It guarantees that once a transaction has been committed, it will remain committed even in the case of a system failure

# Structured Query Language (SQL)

| | |
|---|---|
| DDL (Data Definition Language) | CREATE, DROP, ALTER, TRUNCATE, COMMENT, RENAME |
| DQL (Data Query Language) | SELECT |
| DML(Data Manipulation Language) | INSERT, UPDATE, DELETE, LOCK, CALL |
| DCL (Data Control Language) | GRANT, REVOLK |
| TCL (Transaction Control Language) | COMMIT, ROLLBACK, SAVEPOINT |

# Spatial Databases - Postgis

- https://postgis.net/workshops/postgis-intro/introduction.html