Data Engineering Day 15:

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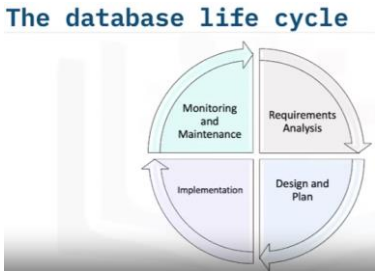
Another link : Azure data Engineer

Relational Database administrations (RDA)

 # Introductions to database management

Database management and its Life cycle:

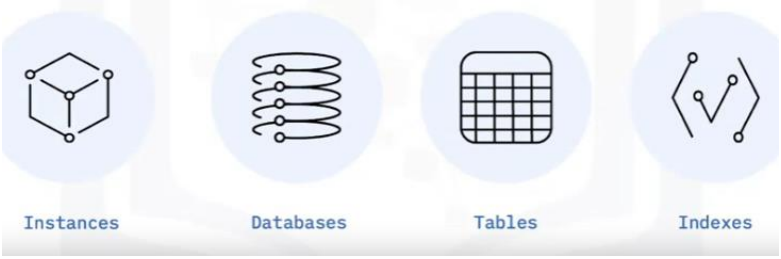


The figure above shows a typical Database and its Life cycle.

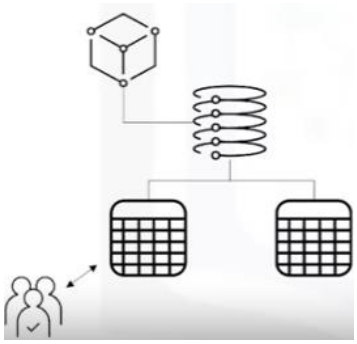
1. **Requirements Analysis:**
   - Understand the purpose and scope of the database.

   - Work with the state holders for analyzing and targeting certain goals.

2. **Design and Plan Stage:**
   - Works with database objects:



- Database Modelling

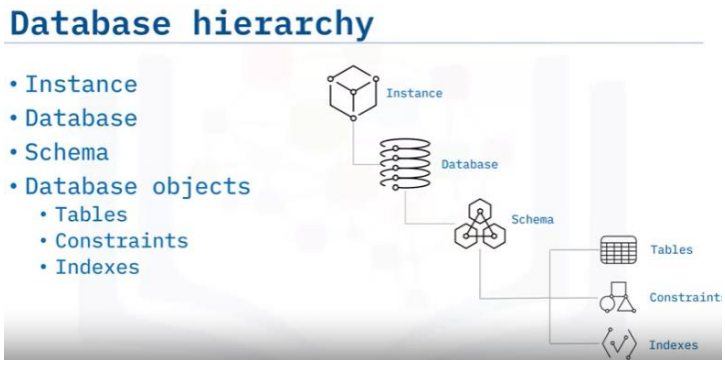


3. **Implementation stage:**
   - Creates and configure a database object like instances example like EC2.
   - Permits user access for developers, Data Engineers, or a group.
   - Automates the repeating tasks such as backups, deployments, and security.
   - Deployment of the database.

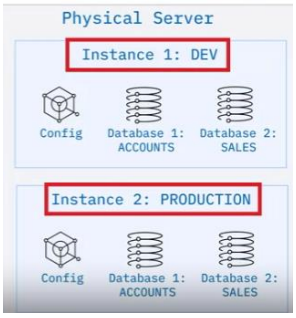
4. **Monitoring and maintain stage:**
   - Looks after the systems for issues or performs maintenance of the system.
   - Review the reports and try to optimize the system accordingly with user's requirements.
   - Automates deployments and the routine tasks such that it can be backup.
   - Trouble shoots operational issues and resolves for smoothing the performances.
   - Ensures security where only authorized users will be permitted to get access to the system.

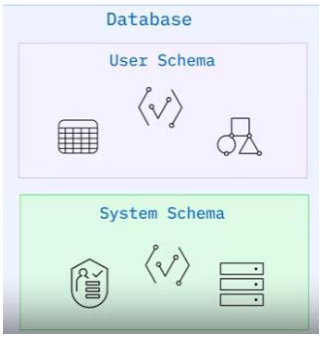
Server objects and **hierarchy:**

 # Database objects:



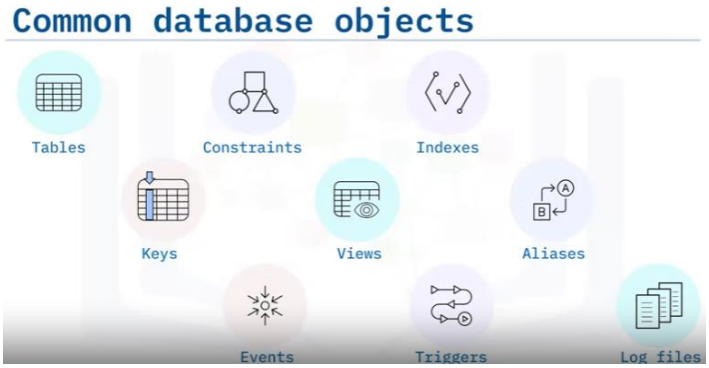
- Instance
  - Instance is the logical boundary for databases, objects, and configurations.
  - Example of instance is EC2 instance etc.
  - It is also possible to create more than one instance in the same server in which it needs a logical separation and in a very instance, it is also possible to create more than one database. Example AWS EC2 instance can have database named db1, db2……. Dbn
  - It is always a good practice to create separate instances for development and for protection.

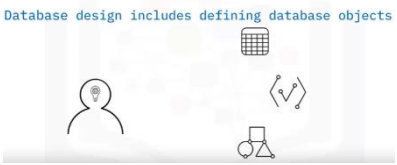




- Schema
  - Schema is another name for database.
  - It contains tables, constrains etc.
  - It can also store a list of database users and their roles.

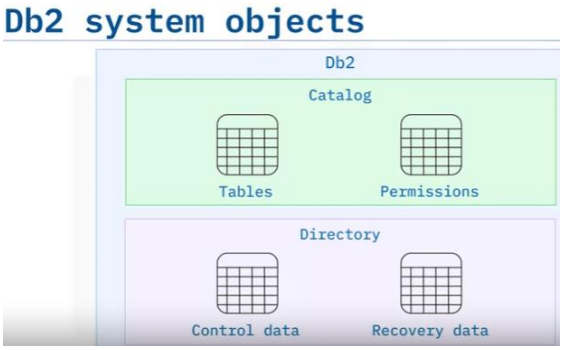
- Database objects:
  - Items that exist within a database
  - Database objects can be created and managed through GUI tools, scripts, and API's.

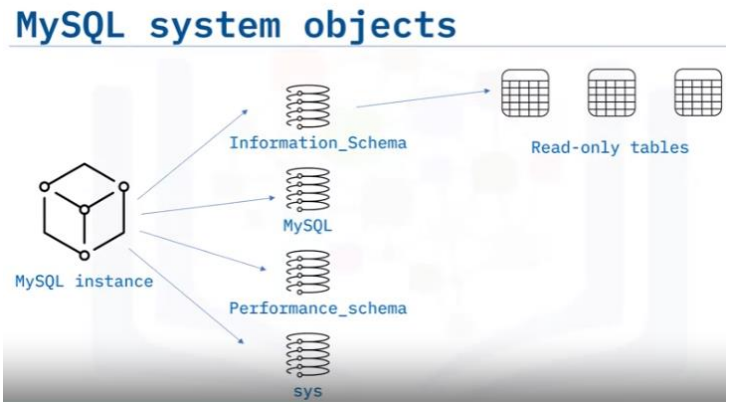




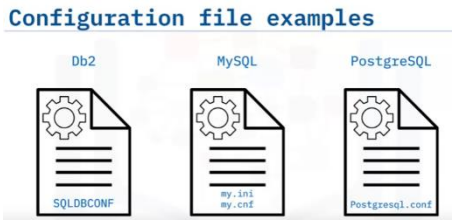
 # System Objects and Database Configurations:

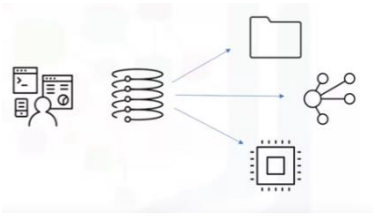
- system objects:
  - It stores the database metadata in special objects.
  - Also known as system database, system schema, catalog, or a dictionary
  - It is also a query to retrieve the information.





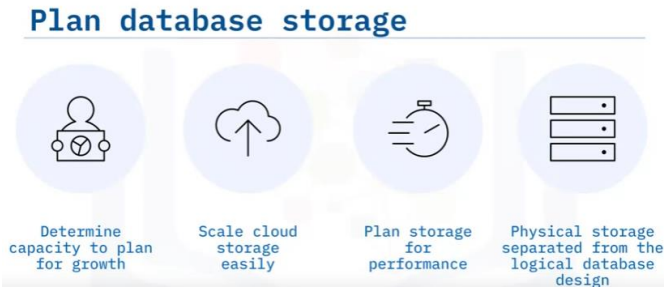
- Configuration files:
  - It sets a configurations parameter during the installations like checking some boxes for additional features, setting directories and memory allocations.





 # Database Storage:

- **Plan database storage:**
  - Determine capacity to plan for growth.
  - Scaling the database or expanding it in a cloud through API's.



- **Database partitions:**
  - splits the tables which contain the very large data into smaller partitions for smooth management.
  - Partitions hold the subsets of the overall data.
  - It is common in data ware housing.
  - The figure on the right represents typical example of Data partitions.