# Tutorial 1: Review question

1. If the layout of records in a file data management system changes, what else must change?

- Data access programs will have to change

1. What kind of relation is supported in a hierarchical data management system?

a. Parent-child

b. Many-to-many

c. Many-to-many-to-many

d. No relations are allowed.

1. What kind of relation is supported in network data management systems?

a. Parent-child

b. Many-to-many

c. Both parent-child and many-to-many

d. No relations are allowed.

4. Give an example of a SQL data manipulation language statement.

- INSERT INTO STUDENT

5. Give an example of a SQL data definition language statement.

- CREATE TABLE STUDENT

6. What is scaling up-scaling out?

- Scale up (Vertical scaling): Upgrade existing database server to add additional or processors, memory, network bandwidth or replace existing server with more capacity.

- Scale out (Horizontal scaling): Adding or removing server if needed. NoSQL server will adapt to use new set of available servers. Scaling up by replacing server require migrate database management to new server. Scale up by adding resource would not require migration, but downtime is expected

7. What do the C and A in the CAP theorem stand for? Give an example of how designing for one of those properties can lead to difficulties in maintaining the other.

- C : consistency

- A : availability

- P : partition protection

- On a query, we can respond to the user with the current value on the server, offering a highly available service. If we do this, there is no guarantee that the value is the most recent value submitted to the database. It is possible a recent write could be stuck in transit somewhere.

8. What is the different between ACID and BASE.

- ACID stands for Atomicity, Consistency, Isolated, Durable. BASE stands for Basically Available, Soft state, Eventually consistent. While the ACID model is focused on data consistency, the BASE model is focused on data availability.

9. Are NoSQL databases likely to displace relational databases as relational databases displaced earlier types of data management systems?

- NoSQL and RDBMS support different tasks and requirements so that NoSQL databases are not likely to displace relational databases as relational databases displaced earlier types of data management systems

10. How many types of NoSQL databases. Describe characteristics of each

- Key-value pair databases

- Document databases

- Column family store databases

- Graph databases