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TYPES OF DATABASES

RELATIONAL

A relational database is a form of database that stores and allows access to data elements that are linked. The relational model, a simple and obvious means of representing data in tables, is the foundation of relational databases. Each row in a table in a relational database is a record with a unique ID called the key. The attributes of the data are stored in the table's columns, and each record usually contains a value for each attribute, making it simple to construct links between data points.

A relational database is a collection of data items with defined relationships that can be accessed easily. The data structures, such as data tables, indexes, and views, are kept separate from the physical storage structures in the relational database paradigm, allowing database managers to update the physical data storage without impacting the logical data structure.

Relational databases are used in the enterprise to organize data and find links between crucial data elements. They make it simple to organize and find information, allowing businesses to make better informed decisions and save money. They work effectively with data that is structured.

ANALYTICAL (OLAP)

OLAP (online analytical processing) software is used to do multidimensional analysis on massive volumes of data from a data warehouse, data mart, or other centralized data storage at rapid rates.

Most corporate data have numerous dimensions, or subcategories, into which it is divided for presentation, tracking, or analysis. Sales numbers, for example, could have multiple dimensions relating to geography (region, nation, state/province, store), time (year, month, week, day), product (clothing, men/women/children, brand, kind), and more.

However, data sets are kept in tables in a data warehouse, and each table can only organize data into two of these dimensions at a time. OLAP collects data from several relational data sets and reorganizes it into a multidimensional structure that allows for extremely quick processing and analysis.

KEY-VALUE

A key-value database is a nonrelational database that stores data using a simple key-value mechanism. Data is stored in a key-value database as a collection of key-value pairs, with a key serving as a unique identifier. Both keys and values can be any type of object, from simple to sophisticated compound objects. Key-value databases are extremely partitionable and can scale horizontally to scales that other database cannot. If a current partition fills to capacity and extra storage space is necessary, Amazon DynamoDB assigns additional partitions to the database.

COLUMN-FAMILY

A column data store is often referred to as a column-oriented database management system (DBMS) or a columnar database management system (DBMS). Data is stored in columns rather than rows in column store DBMS. Data is stored in rows and data characteristics are stored as column headers in relational database management systems (RDBMS). Although both row-based and column-based DBMS employ SQL as their query language, column-oriented DBMS may be faster. Consider the following scenario: you need to list all names from a table based on an ID; rather than wading through all the rows, you could merely retrieve a single table field**.**

1. Column store DBMS use a keyspace that is like a database schema in RDBMS.
2. Column store DBMS have a concept called a column family. A column family is like a table on RDBMS. The keyspace contains all the column families in a database.
3. A column family contains multiple rows. Each row has a unique key called Row Key, which is a unique identifier for that row.
4. Each column in column store databases has a Name, Value, and Time Stamp fields.
5. Each row can contain a different number of columns. All rows don't have to have the same columns.
6. Each column can contain multiple rows. All rows don't have to have the same data type or size.

GRAPH

Graph database is a database designed to treat the relationships between data as equally important to the data itself. It is intended to hold data without constricting it to a pre-defined model. Instead, the data is stored like we first draw it out - showing how each individual entity connects with or is related to others**.** A graph database is defined as a specialized, single-purpose platform for creating and

manipulating graphs. Graphs contain nodes, edges, and properties, all of which are used to represent and store data in a way that relational databases are not equipped to do.

DOCUMENT

A document database is a type of nonrelational database that is designed to store and query data as JSON-like documents. Document databases make it easier for developers to store and query data in a database by using the same document-model format they use in their application code. The flexible, semi structured, and hierarchical nature of documents and document databases allows them to evolve with applications' needs. The document model works well with use cases such as catalogs, user profiles, and content management systems where each document is unique and evolves over time. Document databases enable flexible indexing, powerful ad hoc queries, and analytics over collections of documents.