Advanced Database – Week 1

Khaula Molapo

20240001

1

A NoSQL database is a modern type of database that stores data in flexible formats instead of fixed tables. In an e-commerce platform, a document-based NoSQL database like MongoDB can store data about users, products, orders, and payments in JSON-like documents.

For example, a product document can include product name, price, category, images, reviews, and stock information in one place. An order document can contain customer details, purchased items, delivery address, and payment status. Each document can have different fields, which makes the system flexible.

The main benefits of NoSQL databases are high speed, scalability, and flexibility. They can handle millions of users and large amounts of data easily. They are also good for real-time applications, frequent updates, and complex data structures, which makes them perfect for modern e-commerce systems.

2

Apache Cassandra is a distributed database designed to handle large amounts of data across many servers. It is highly scalable, meaning you can add more servers without stopping the system. Cassandra is also fault-tolerant, so if one server fails, the system still works.

It uses a peer-to-peer architecture, where all nodes are equal, and there is no single central server. This makes it very reliable and fast. Cassandra is often used by big companies like

Netflix and Instagram because it can handle huge data loads and high traffic. It is suitable for real-time applications, big data systems, and systems that need high availability.

3

First, I installed MongoDB Compass from the official MongoDB website. After installing it, I opened the application and connected it to the local MongoDB server. Then, I created a new database called “ecommerceDB” and a collection called “products”.

Inside the collection, I created a sample document with fields such as productName, price, category, stock, and rating. MongoDB Compass provides a graphical interface that makes it easy to view and edit documents without writing complex commands.

The process was simple and user-friendly. MongoDB Compass helps beginners understand how NoSQL databases work and how data is stored in documents instead of tables.

4

Big data refers to extremely large and complex datasets that traditional databases cannot handle easily. These datasets come from social media, online transactions, sensors, videos, and many other sources.

Big data has changed how databases are designed and used. Traditional relational databases are often not enough, so organizations use NoSQL and distributed databases to store and process massive data. Technologies like Hadoop, Spark, and cloud databases are widely used.

Big data helps companies make better decisions, predict customer behavior, improve services, and create personalized experiences. It has also increased the demand for faster, scalable, and flexible database systems in many industries such as healthcare, finance, and e-commerce.