Introduction:

MongoDB is a popular NoSQL (Not Only SQL) database system that stores data in a flexible document-oriented format. Unlike relational databases that use a rigid table structure, MongoDB offers a more dynamic approach that excels in handling:

- **Unstructured or semi-structured data:** Often encountered in modern web applications, mobile apps, and IoT projects, this type of data doesn't fit neatly into predefined tables. MongoDB's document model, similar to JSON (JavaScript Object Notation), accommodates this data seamlessly.
- **Evolving data structures:** As your application's data requirements change, MongoDB's schema-less design allows you to modify documents without altering the entire database structure. This adaptability is a significant advantage for applications under continuous development.

Key Characteristics of MongoDB:

- **Document-Oriented Storage:** Data is organized into JSON-like documents, each containing key-value pairs. Documents can embed other documents and arrays, enabling you to model complex relationships efficiently.
- **Horizontal Scalability:** MongoDB scales horizontally by distributing data across multiple servers (sharding). This allows you to handle growing data volumes without performance degradation.
- **High Availability:** Replication ensures data redundancy. If a server fails, reads and writes can be directed to a replica, minimizing downtime.
- **Rich Query Language:** MongoDB provides a powerful query language that allows you to search, filter, and aggregate data using a JSON-like syntax.
- **Cross-Platform Support:** MongoDB works on various operating systems, making it a versatile choice for development environments.

What is mangoDB?

MongoDB is a popular NoSQL database system that stores data in a flexible document-oriented format. Let me know if you'd like to hear more about it!

MongoDB Data types:

- **String:** Most common type, used for text data (UTF-8 encoded).
- **Integer:** Stores whole numbers (32-bit or 64-bit signed integers depending on your server).
- **Double:** Represents floating-point numbers with decimal precision.
- **Boolean:** Stores true or false values.
- **Null:** Represents the absence of a value.

Complex Data Types:

- **Array:** Holds an ordered collection of values of any data type. Useful for lists or sequences of data.
- **Object:** Similar to a JSON object, it stores key-value pairs where keys are strings and values can be any data type. Enables embedding documents within documents for complex relationships.
- **Date:** Represents a date and time in milliseconds since the Unix epoch (January 1, 1970, 00:00:00 UTC).

Other Data Types:

- **ObjectID:** A unique 12-byte identifier generated by MongoDB for each document.
- **Binary Data:** Stores raw binary data (e.g., images, files).
- **Regular Expression:** Used for pattern matching in text searches.
- **JavaScript Code:** Can be embedded within documents for server-side execution.
- **Timestamp:** Internally used for timestamps in the oplog (operation log) but not generally used for storing application data.

Applications of MangoDB:

- **E-commerce:** Store product information (descriptions, images, prices), user accounts (profiles, shopping carts, order history), and content management systems (articles, blog posts).

- **Social Media:** Manage user profiles, posts, comments, likes, and follower relationships.
- **Real-time Applications:** Build chat applications, collaborative editing tools, and real-time dashboards using MongoDB's ability to handle frequent updates and deliver data efficiently.

Mobile Applications:

- Develop data-driven mobile apps that store user data locally on the device and synchronize with a central MongoDB database in the cloud.
- Build location-based apps by leveraging MongoDB's geospatial indexing capabilities for efficient location queries.

Content Management Systems (CMS):

- Store website content (articles, pages, images) with flexible schemas to accommodate different content types.
- Manage user-generated content (comments, reviews) efficiently.

Internet of Things (IoT):

- Store sensor data from connected devices (temperature, pressure, device status) and analyze it for insights and trends.
- Manage device configurations and user settings in a scalable way.

Big Data Applications:

- Handle large datasets due to MongoDB's horizontal scaling capabilities (sharding) for efficient storage and retrievas

What is Database?

database is essentially a big organized collection of data stored electronically on a computer system. This data can be anything from text and numbers to images, videos, and files. Databases are managed by software called a Database Management System (DBMS) .
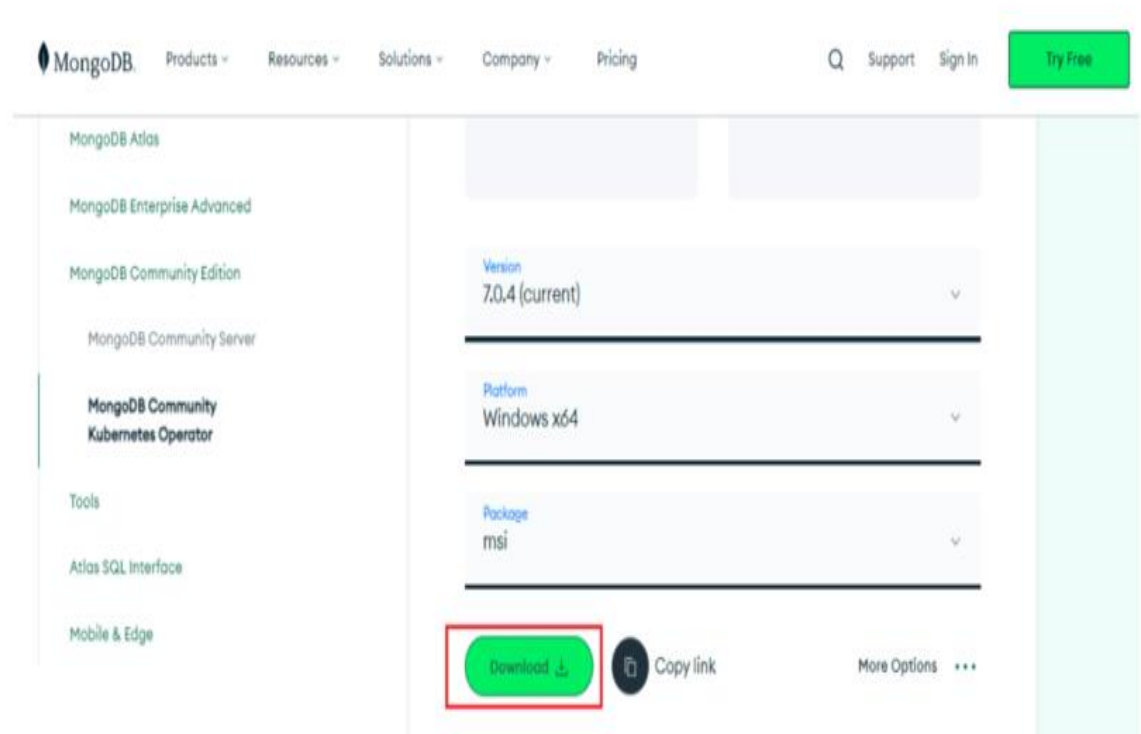
Installation of mango shell OR studio3t

- Mongo Shell download link
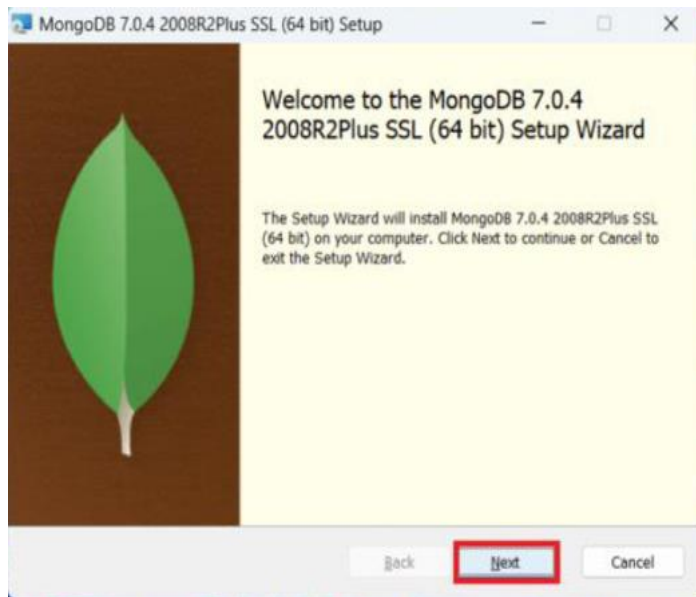- All the work is expected to do it in mongo shell not in mongo compass

OR

- You can also install Studio3T
- Connect to mongodb://localhost:27017

Steps to install mango db

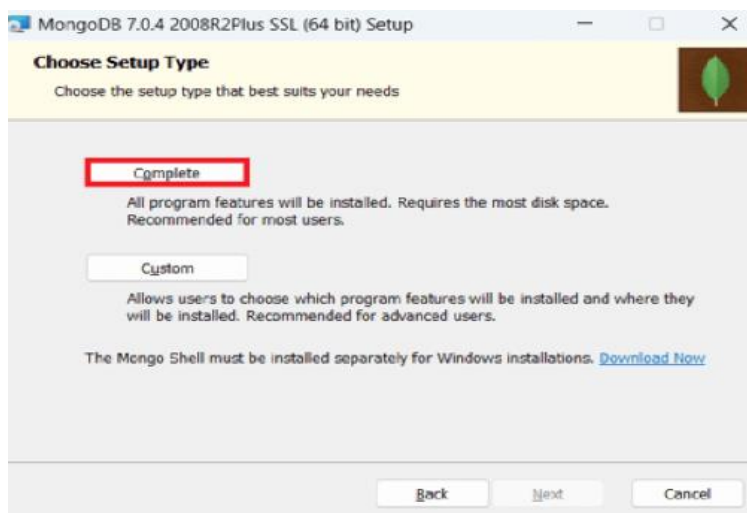Step 1:go to the mangodb download center to download the mangodb community server

Step 2: when the download is complete open the msi file and click the next button in the start up screen
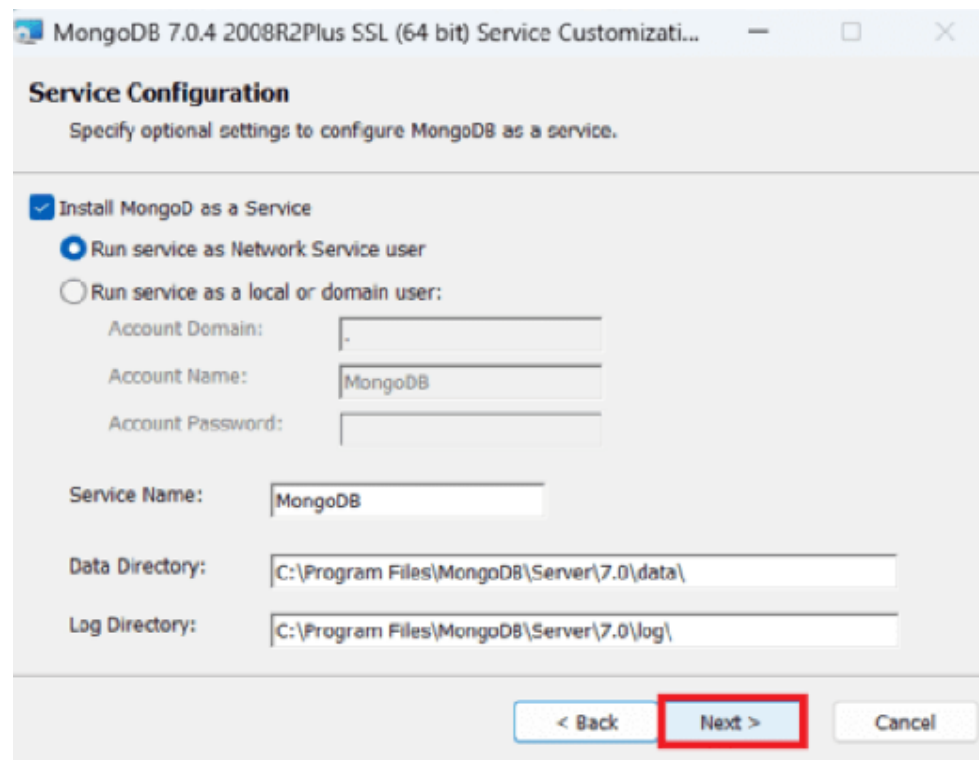
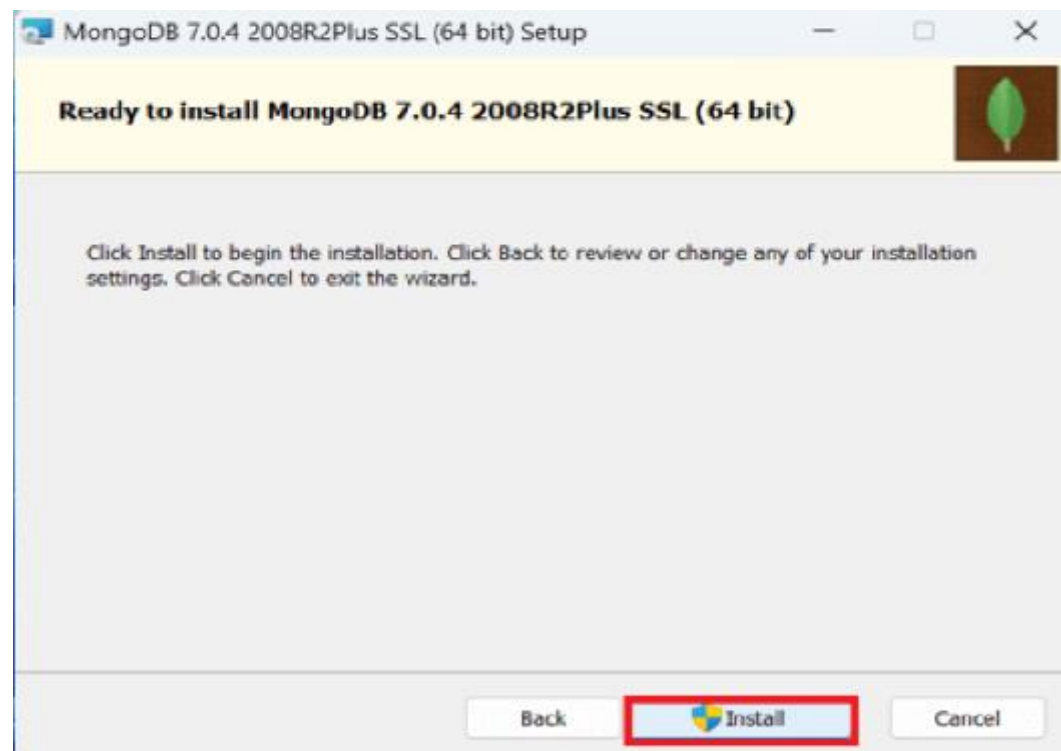Step 3:now accept the end-user license agreement and click the next button:
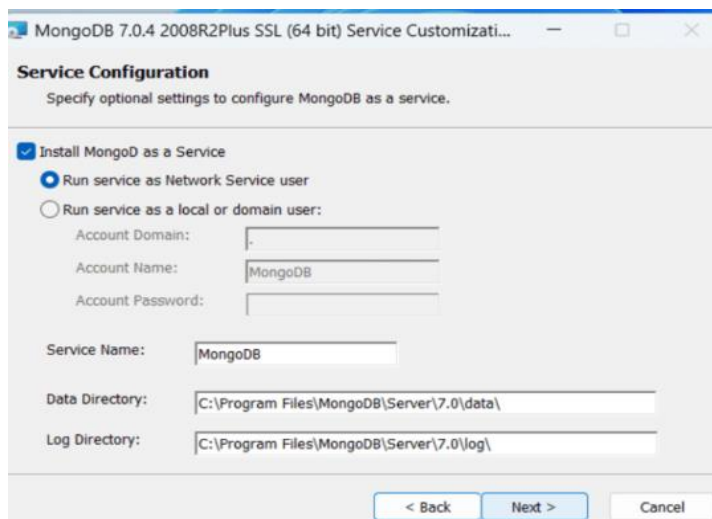
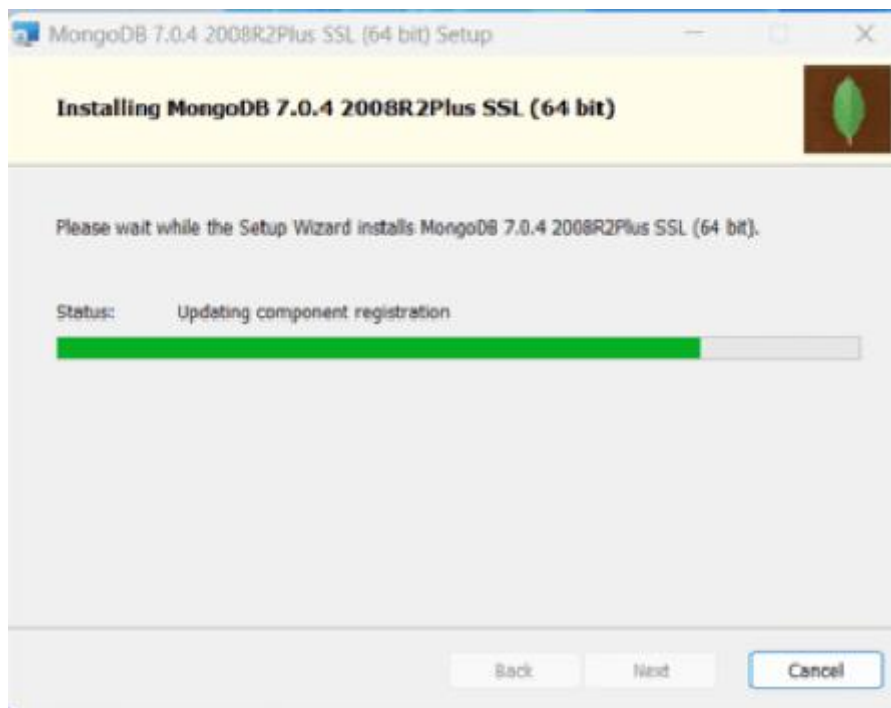Step 4:now select the complete option to install all the program features ;

Step 5:select"run service as network service user" and copy the part of data directory,clikc next

Step 6:click the install button to start the mangodb installation process :

Step 7:after clicking on install button installation of mongodb begins:

Step 8:now click the finish button to complete the mongodb installation process.