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Assignment 1

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Question 1

NoSQL database:

High-performance, non-relation data stores. They excel in their ease-of-use, scalability, resilience and availability characteristics. Instead of joining tables of normalized data, NoSQL stores unstructured or semi-structured data, often in key-value pairs or JSON documents. (Vettor, et al., 2020)

Motivation for NoSQL:

1. Scalability –
   Because NoSQL databases are so scalable, they can easily manage massive volumes of data and traffic. They are therefore a suitable fit for a social media platform like this one that must manage high volumes of traffic or data. (Geeksforgeeks, 2025)

2. Flexibility:
   NoSQL databases can adapt to dynamic changes in the data model since they are made to manage unstructured or semi-structured data. Because of this, NoSQL databases are a suitable fit for this social media platform, which must continuously manage shifting data needs. (Geeksforgeeks, 2025)

3. Performance:
   NoSQL databases can provide better performance than conventional relational databases since they are made to manage massive volumes of data and traffic. (Geeksforgeeks, 2025)

Kinds of data that would be stored in such a database:

1. Multimedia files – photos & videos
2. User profiles – profile pictures, names, bios & email addresses

3. Messaging data – chats & timestamps
4. Posts – images, videos & links

Four types of recommended database:

1. Document store: Documents containing data are usually based on JavaScript Object Notation (JSON). The last learning unit of this program will utilize MongoDB, a NoSQL database that stores documents. (Big Data Analytics News, 2014)

2. Key-value stores: One kind of non-relational database, also referred to as a NoSQL database, is a key-value database, which stores data using a straightforward key-value approach. It saves information as a set of key-value pairs, where each key acts as a distinct identifier. (AWS, 2025)

3. Column stores: These were designed to handle and store massive volumes of data spread over several computers. Although they point to many columns, the keys are still present. By column family, the columns are ordered. (Big Data Analytics News, 2014)

4. Document databases: Since each key can have nested values, document databases are really the next step up from key/value databases. More effective searching is supported by document databases. (Big Data Analytics News, 2014)

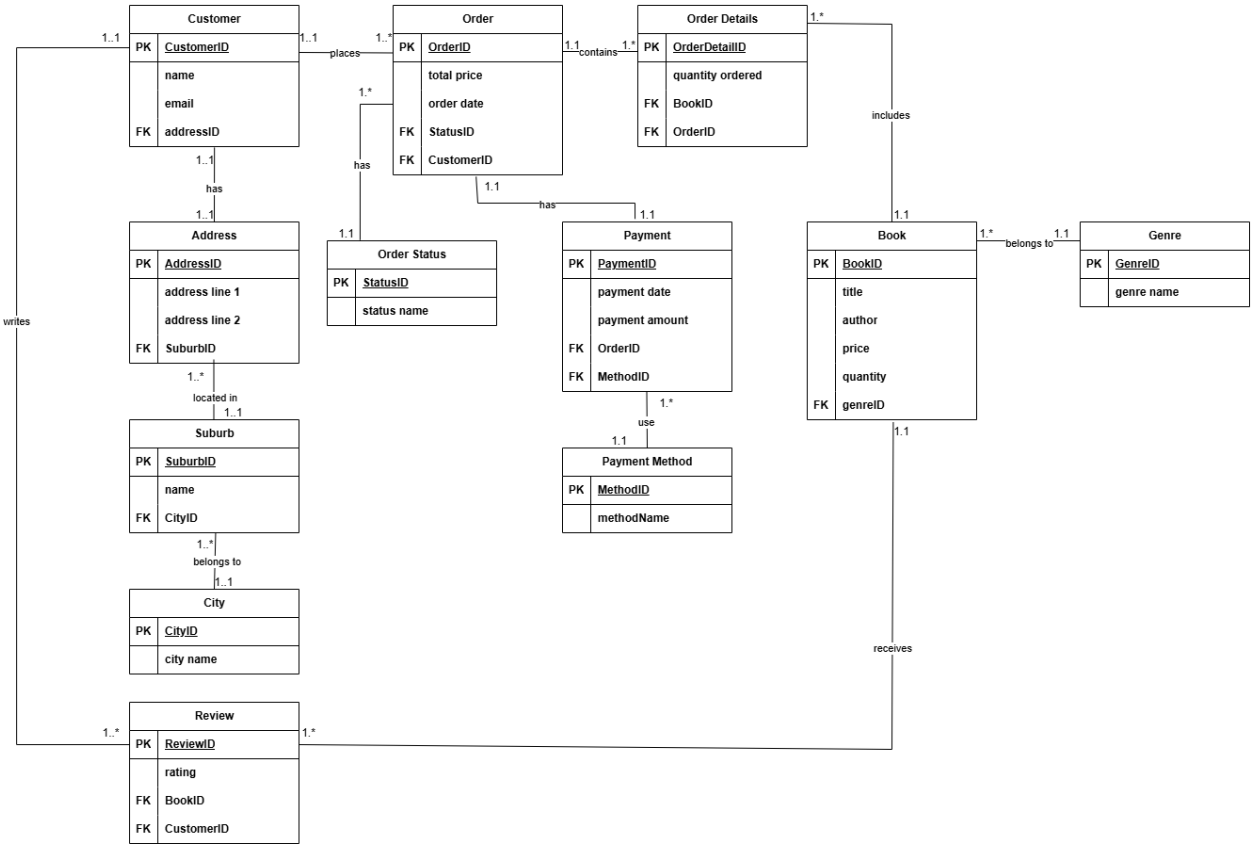
The three Vs of big data:

1. Variety: Text, photos, videos, links, and other forms of data (organized, semi-structured, and unstructured) are all stored on social networking sites. Multiple data types are supported by NoSQL databases without the need for complex schemas. (Ciorba, 2022)

2. Velocity: Real-time data generation and updating (such as live comments, alerts, and status changes) is possible. NoSQL databases provide for quick retrieval and processing. (Ciorba, 2022)

3. Volume: Every day, social media sites produce enormous volumes of data, including billions of messages, postings, and video uploads. Such large quantities are handled well by NoSQL databases. (Ciorba, 2022)

Question 2



Made using Draw.io.

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