PRACTICAL ASSIGNMENT

INSY6112

TALHA BULBULIA

ST10312198

Due: 28 March 2025

Content Page

The recommended database for the given social media platform is a **NoSQL database**.

NoSQL: Non-relational databases—that is, NoSQL databases—store data in flexible formats such texts, key-value pairs, graphs, or broad columns. It is best for managing big volumes of structured, semi-structured, and unstructured data since it lets dynamic schema creation possible. (MongoDB. 2025).

Motivation:

Scalability: NoSQL databases are built to expand horizontally by adding extra servers in order to handle vast amounts of data. This is absolutely vital for a social media network growing and witnessing exponential data increase. (Babltz. 2023).

Schema Flexibility: NoSQL databases—especially document-based databases like MongoDB—allow variable schemas, which simplifies the storage of a range of data formats without a predefined structure since users create varied kinds of content (text, images, and videos). (Babltz. 2023).

Real-Time Data Processing: NoSQL databases are built for real-time analytics like the instantaneous computation of likes, shares, and trending topics. They also offer quick read-through and write ability. This ensures a seamless user experience free from much lag. (Babltz. 2023).

NoSQL databases store the following types of data:

- **User Profiles:** User profiles call for usernames, profile images, bios, preferences, and contact information.

- **Content Data:** Posts, photos, videos, comments, and other timestamped media items comprise content data. (Babltz. 2023).

- **User Interactions**: Real-time captures of likes, shares, views, follows, and notifications—user interactions.

- **Analytics Data:** Live analytics include click-through rates, popular hashtags, and daily likes per minute. (Babltz. 2023).

NoSQL database types include:

- Document-based databases—like those found in MongoDB—store data in JSON-like documents. With layered fields for comments and reactions, every document can stand for a whole user or post. This organization is simple to search and enables dynamic material. (Ashtari. 2022).

- Redis, for example, store data as simple key-value pairs whereby every key is unique and translates to a single data item. For session data, user preferences, and real-time feeds especially, it is perfect. These technologies are incredibly light and quick. (Ashtari. 2022).

- Like relational databases, wide-column stores—e.g., Cassandra—organize data into rows and columns but each row can have a varied number of columns. Their best performance is for fast, large-scale writes. Ideal for time-series data including user activity logs. (Ashtari. 2022).

- Graph databases—such as Neo4j—are made to manage intricate connections via nodes and edges. On social media where users, posts, and interactions are all linked, they are perfect. Questions like "friends of friends" or suggestions are easily addressed. (Ashtari. 2022).

In this case, the three Vs of big data are:

1. Volume: Mass data volumes from millions of worldwide users publishing and interacting on the site are handled everyday. (BIGDATA LDN. 2018).

2. Variety: Data is produced in numerous formats—text, image, video, live streams—requiring a versatile storage system. (BIGDATA LDN. 2018).

3. Velocity: Data has to be handled in real time, with quickly occurring analytics, notifications, and user feed updates. (BIGDATA LDN. 2018).

Question 2
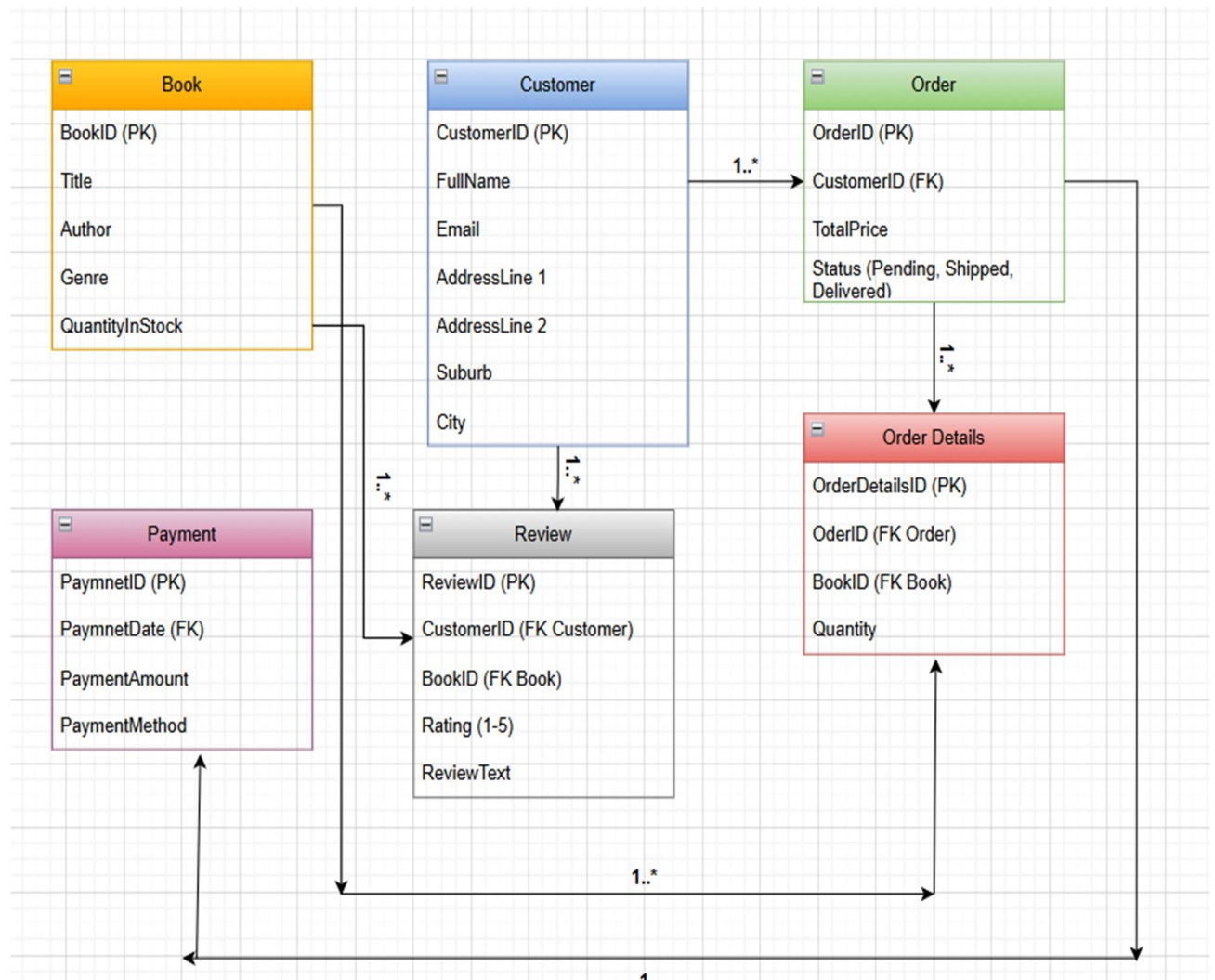
Reference List

Ashtari, H, 2022. What Is NoSQL? Features, Types, and Examples, 18 October 2022. [Online]. Available at: https://www.spiceworks.com/tech/artificial-intelligence/articles/what-is-nosql/#:~:text=NoSQL%20databases%20are%20defined%20as,column%2C%20and%20key%2Dvalue. [Accessed 25 March 2025].

Babltz, K, 2023. SQL vs NoSQL Databases: Key Differences and Practical Insights, 23 November 2023. [Online]. Available at: https://www.datacamp.com/blog/sql-vs-nosql-databases . [Accessed 24 March 2025].

BIGDATA LDN, 2018. Big Data: The 3 Vs explained. 10 August 2018. [Online]. Available at: https://www.bigdataldn.com/en-gb/blog/data-engineering-platforms-architecture/big-data-the-3-vs-explained.html#:~:text=There%20are%20three%20defining%20properties,is%20to%20old%20fashioned%20data. [Accessed 24 March 2025].

draw.io (2025). *Flowchart Maker & Online Diagram Software*. [online] app.diagrams.net. Available at: https://app.diagrams.net/.

MongoDB, 2025. What is NoSQL? 2025. [Online]. Available at: https://www.mongodb.com/resources/basics/databases/nosql-explained . [Accessed 24 March 2025].