A document answering the practical task questions at the end of the PDF.
2025-07-09 EJS

Question 1
Data are raw numbers, figures, or facts. Without additional context, that is all they are. Metadata provides details about the data that provide context. For example, units and labels associated with data figures are the first and most necessary component of beginning to understand what raw data could mean or its significane. Finally, we have information which is processed data--which often requires the supplemental details provided by the metadata. Information can also be the result of more advanced processing techniques including statistical analysis, visualization techniuqes (e.g. graphs or charts), or isolating and describing relationships that may not have been obvious or clear from the data and their metadata alone.

Question 2
Metadata provides details about the data. Examples of metadata include labels and units.

Question 3
DBMS stands for DataBase Management System. DBMS are programs (open source or enterprise level) that contain and maintain the raw data and enable users to update or query the data in a controlled manner. There are numerous advantages, but some of the most salient are convenience, security (possibly by managing which users can access particular information), and data integration.

Question 4
An operational database is optimized for day-to-day functions of a group. The managed data are updated often and required frequently. An example use-case would be inventory management at a small business.
In contrast, an analytical database stores long-term historical data for determining trends or making decisions. These are optimized for complex querries such that insight may be gained by the user. An example would be a data warehouse or data farm.

Question 5
NoSQL databases are most effective when the data stored does not have rigid structure or minimal structure. For example, the data might be images, videos, or sound files (like music or radio recordings).

Question 6
SQLite does not required server configuration. It is a free, open-source DBMS that is lightweight, reliable, and fast. For smaller applications, it can be embedded directly, making it convenient too.

Question 7
ACID is an acronym for four properties: atomicity, consistency, isolation, and durability. In a DBMS context, these properties imply the following details.
Atomicity: that each datapoint in the database cannot be further broken down into greater detail.
Consistency: that the information in a database are accurate (or as accurate as possible)
Isolation: that more than one operation (by one or more users of the database) can peform actions on the database concurrently. For example, two users might wish to use the same DBMS to make different querries at the same time.
Durability: that the data stored is permanent and could therefore be recovered in the event of a failure. This way the database owners can still continue using the accumulated data, even after a crash.