1. Puzzles in database management systems (DBMS) can be a fun and challenging way to improve your understanding of database concepts and SQL queries. Here are some examples of puzzles in DBMS:

Query Puzzle: Write an SQL query to find the second highest salary from an employee table.

Join Puzzle: You have two tables, one with a list of orders and another with a list of customers. Write an SQL query to find the total number of orders placed by customers who live in the USA.

Group by Puzzle: Write an SQL query to find the total sales made by each salesperson in a sales table.

Data Modeling Puzzle: Given a set of requirements, design a database schema and write the SQL queries to create and populate the tables.

Index Puzzle: Given a table with millions of rows, write an SQL query that returns a subset of data based on a specific column. How can you optimize this query using indexes?

Solving puzzles like these can help you improve your SQL skills and gain a better understanding of how databases work.

2. Entity-Relationship Model Puzzle: You need to design a database schema for a university that stores information about students, courses, and instructors. The schema should allow for a student to enroll in multiple courses, and each course to have multiple instructors. Draw an entity-relationship diagram for the schema.
   Normalization Puzzle: Given the following table:

3. OrderID	4. CustomerName	5. CustomerAddress	6. ItemName	7. ItemQuantity
9. 1	10. John Smith	11. 123 Main St.	12. T-shirt	13. 2
15. 1	16. John Smith	17. 123 Main St.	18. Pants	19. 1
21. 2	22. Jane Doe	23. 456 Maple Ave.	24. Shoes	25. 1
27. 2	28. Jane Doe	29. 456 Maple Ave.	30. Jacket	31. 1

Normalize this table to eliminate redundancy.

3. Join Puzzle: Given two tables, Customers and Orders, write an SQL query to find all customers who have placed an order in the last 30 days.

4. Indexing Puzzle: You have a table with millions of rows and you need to optimize a query that filters on a specific column. Which type of index would be best suited for this query, and how would you create and use the index?

5. Solving these puzzles can improve your understanding of key database concepts such as data modeling, normalization, indexing, and SQL queries.