

NSQ1 S22 Course Assignment 3

Question 1 – Model database

Design a graph model for the bookstore model from the 1st course assignment. Make note of the choices you make and why. Document the model using either <https://arrows.app/> or screenshots from the browser.

Design the model to be used with the queries from the 1st course assignment.

Question 2 – Work with data

Answer the following questions in MongoDB using your model from question 1.

Modifying data

Use Cypher statements to execute the following scenarios. Use transactions where necessary (but if you manage to do everything in one statement it won't be).

If nothing else is stated, assume you know the object ids of the objects involved.

1. Sell a book to a customer.
2. Change the address of a customer.
3. Add an existing author to a book.
4. Retire the "Space Opera" category and assign all books from that category to the parent category. Don't assume you know the id of the parent category.
5. Sell 3 copies of one book and 2 of another in a single order

Querying data

Write Cypher queries to return the following data

1. All books by an author
2. Total price of an order
3. Total sales (in £) to a customer
4. Books that are categorized as neither fiction nor non-fiction
5. Average page count by genre
6. Categories that have no sub-categories
7. ISBN numbers of books with more than one author
8. ISBN numbers of books that sold at least X copies (you decide the value for X)
9. Number of copies of each book sold – unsold books should show as 0 sold copies.
10. Best-selling books: The top 10 selling books ordered in descending order by number of sales.
11. Best-selling genres: The top 3 selling genres ordered in descending order by number of sales.

12. All science fiction books. Note: Books in science fiction subcategories like cyberpunk also count as science fiction. Don't use your knowledge of the concrete category structure.
13. Characters used in science fiction books. Note from (12) applies here as well.
14. Number of books in each category including books in subcategories.

Question 3 – Graph Data Science

Data science isn't exactly an exact science, so you are free to interpret this as you will.

Similar Customers

We are trying to find similar customers based on their purchase decisions to help with suggestions for next book to purchase. How would you use the Graph Data Science library to find this? Explain the choice of graph and algorithm and show the code.

Key Customers

With the system above in place, it becomes important to sell to key customers so that they can drive further sales. How would you use the Graph Data Science library to find key customers? Explain the choice of graph and algorithm and show the code.

Book Suggestions

How would you use the Graph Data Science library to give book suggestions? Explain the choice of graph and algorithm and show the code.

Question 4 – Report

Write a report on the experience gained by completing Question 1 and 2 above. The report should contain answers to the questions

- What were the decisions taken in the modelling?
- Why were these decisions taken?
- What were the consequences of these decisions?
- What were the difficult and easy parts of the exercise?
- How does that compare to the other exercises?
- What are the advantages and disadvantages of graph databases compared to the other database types?

Rules

- Make the exercise in groups of 2 – 4
- Hand in to itslearning no later than 9 May