

CS561: Advanced Topics in Database Systems Spring-2016

(MongoDB Project 2)
(Done in teams)

Total Points: 100 (10 each question)

Release Date: 04/19/2016

Due Date: 05/03/2016 (midnight 11:59pm)

References: Lecture notes & MongoDB Manual

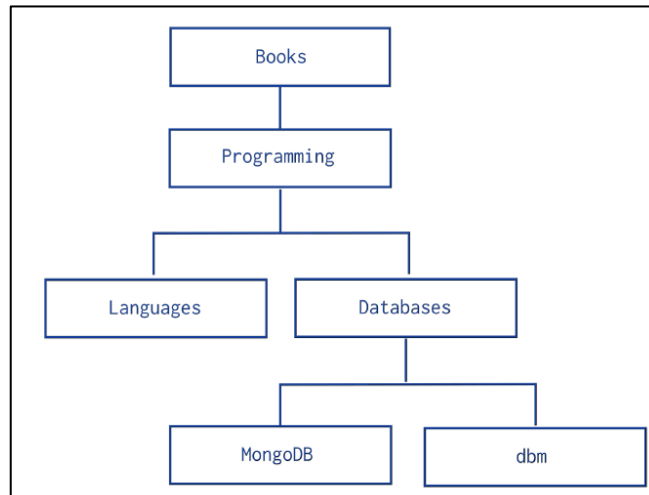


Figure 1: Tree Structure Relationships

Question 1

1) Assume we model the records and relationships in Figure 1 using the Parent-Referencing model (Slide 49 in MongoDB-2). Write a query to report the ancestors of “MongoDB”. The output should be an array containing values [{Name: “Databases”, Level: 1}, {Name: “Programming”, Level: 2}, {Name: “Books”, Level: 3}]

** Note: “Level” is the distance from “MongoDB” node to the other node. It should be computed in your code*

2) Assume we model the records and relationships in Figure 1 using the Parent-Referencing model (Slide 49 in MongoDB-2). You are given only the root node, i.e., `_id = “Books”`, write a query that reports the height of the tree. (It should be 4 in our case).

3) Assume we model the records and relationships in Figure 1 using the Child-Referencing model (Slide 54 in MongoDB-2). Write a query to report the parent of “dbm”.

4) Assume we model the records and relationships in Figure 1 using the Child-Referencing model (Slide 54 in MongoDB-2). Write a query to report the descendants of “Books”. The output should be an array containing values [“Programming”, “Languages”, “Databases”, “MongoDB”, “dbm”]

5) Assume we model the records and relationships in Figure 1 using the Child-Referencing model (Slide 54 in MongoDB-2). Write a query to report the siblings “Databases”.

Question 2

As you did in MongoDB Project 1, Create a collection named “test”, and insert into this collection the documents found in this link (10 documents): <http://docs.mongodb.org/manual/reference/bios-example-collection/>

- 1) Write an aggregation query that groups by the award name, i.e., the “award” field inside the “awards” array, and reports the count of each award. (Use Map-Reduce mechanism)
- 2) Write an aggregation query that groups by the birth year, i.e., the year within the “birth” field, are report an array of _ids for each birth year. (Use Aggregate mechanism)
- 3) Report the document with the smallest and largest _ids. You first need to find the values of the smallest and largest, and then report their documents.
- 4) Use the \$text operator to search for and report all documents containing “Turing Award” as one sentence (not separate keywords).
- 5) Use the \$text operator to search for and report all documents containing either “Turing” or “National Medal”.

Submission Mechanism

Submit all your statements in a single text file electronically using blackboard system.