Homework 1: Firebase

DSCI 551 – Spring 2024

Due: 11:59pm, February 2, 2024

Points: 100

In this homework, we will use firebase for distributed data storage. Suppose we are to store the information about a collection of books. Each book is represented using a JSON object, containing author, title, year, and price. Suppose we partition the books by hashing on the author of the book and store books in two different Firebase realtime databases, depending on the hash value. For example, if h('John Smith') = 0, we will store in database 0; otherwise, in database 1.

The homework consists of the following tasks. You need to create your own two firebase realtime databases and design an appropriate hash function for hashing on the author names.

Complete the homework by writing the below methods in the given template.

Operations:

1. **[**40 points**] add_book:** Create a Python method add_book that takes a book_id and JSON object that contains the book information (with values for all four attributes) and stores the book in one of the databases, based on the hash value of the author as described above.
   Example:
   python3 file_name.py add_book 100 '{"author": "John Smith", …}'

2. **[**30 points**] search_by_author**: Create a Python method search_by_author that finds all books written by the author.
   - **Requirements**: You should only retrieve the books by the given author from the firebase databases. You will receive zero points if your query to Firebase downloads the entire database, or books not written by the requested author.

   Example:
   python3 file_name.py search_by_author "John Smith"

3. **[**30 points**]search_by_year**: Create a Python method search_by_year.py that finds all books published in the specified year.
   - **Requirements:** You will receive zero points if your query to Firebase downloads the entire database, or books not published in the given year.

   Example:
   python3 file_name.py search_by_year 2023

ALLOWED LIBRARIES: json, requests , sys

SUBMISSION INSTRUCTIONS:

1. A single python file with name: **[Student_Name]_hw1.py** [replace Student_Name with your name] Eg. John_Smith_hw1.py
2. Do not modify any contents in the template. Just fill the template by reading the comments.
3. The test script will accept the return data same as specified in the template.
4. Testing is done by test script with different test cases. So points will only be awarded if the method returns the expected result.
5. You will get 0 points if the code breaks for any syntax errors or any other problems. Please test the code thoroughly before submitting.
6. **Please delete the both firebases when submitting the HW. The database should be empty without any data [keys and values].**