B4M36DS2 – Database Systems 2

Practical Class 6

Redis: indexing, search, persistence

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CourseWare Wiki **https://cw.fel.cvut.cz/b231/courses/b3b36prg/start**

Example 1: Storing Location Data

HSET **location:1** name "Eiffel Tower" **lon** 48.8584 **lat** 2.2945

HSET **location:2** name "Statue of Liberty" **lon** -74.0445 **lat** 40.6892

Example 2: Storing and Retrieving Geospatial Data

GEOADD locations 48.8584 2.2945 "**location:1**"

GEOADD locations -74.0445 40.6892 "**location:2**"

GEODIST locations **location:1 location:2** km

Example 3: Storing and Retrieving Geospatial Data

HSET **location:Palermo** name "Palermo" country "Italy"

HSET **location:Catania** name "Catania" country "Italy"

GEOADD locations 13.361389 38.115556 "**location:Palermo**"

15.087269 37.502669 "**location:Catania**"

GEODIST locations **location:Palermo location:Catania** km

GEOSEARCH locations FROMLONLAT 13 38 BYRADIUS 100 km ASC
1) "location:Palermo"

Alice Brown is traveling by car.

Her route is Rome (3 days) -> Venice (2 days) -> Milan (3 days).

Insert this information and define distances between all visited cities.

Rome (Roma): Latitude 41.8919° N, Longitude 12.5113° E
Venice (Venezia): Latitude 45.4371° N, Longitude 12.3327° E
Milan (Milano): Latitude 45.4643° N, Longitude 9.1895° E

Example 1: Basic Transaction

MULTI
SET key1 "Hello"
SET key2 "World"
EXEC

Example 2: Transaction with error before EXEC (syntactic error)

MULTI
INCR counter
LPUSH mylist
INCR counter
EXEC

Example 3: Transaction with Conditional Execution (WATCH)
SET mykey 10
WATCH mykey
GET mykey
MULTI
INCR mykey
EXEC

Example 4: Discarding a Transaction
MULTI
SET key1 "Hello"
DISCARD

Example 5: Error after EXEC
SET mykey 10
MULTI
INCR mykey
LPOP mykey
EXEC

Example: The Bank account has a number and balance.

Write Redis transaction to transfer money from one account to another one.

MULTI

HGET sender_account_number balance

HGET receiver_account_number balance

HSET sender_account_number balance (current_balance - amount)

HSET receiver_account_number balance (current_balance + amount)

EXEC

Insert information about movies

      (id, title, plot, release year, genre, rating, votes)

Create an index

Search all username:movie: that contain the term "war"

    1) (integer) 1
    2) "username:movie:11002"
    3) 1) "title"
       2) "Star Wars: Episode V - The Empire Strikes Back"
       3) "release_year"
       4) "1980"
       5) "rating"
       6) "8.7"

Insert information about books

  (title, author, genre, publication_year)

Search all books that
1) contain "Fiction" in the genre field
2) published in the 20th century

```
1) (integer) 1
2) "book:1"
3) 1) "title"
   2) "To Kill a Mockingbird"
   3) "author"
   4) "Harper Lee"
   5) "genre"
   6) "Fiction"
   7) "publication_year"
   8) "1960"
```

Insert some data about restaurants into Redis
(name, location, cuisine)

Search:
1) all restaurants that serve "Italian" cuisine
2) all restaurants within a 1000 km radius of a given point
(48.8584 latitude and 2.2945 longitude)
3) count the number of restaurants for each type of cuisine

Exercise 8 – Aggregation

Insert some data about username:books into Redis

HSET **username:**book:1 title "Book A" author "Author 1" genre "Fiction" price 10 rating 4.5
HSET **username:**book:2 title "Book B" author "Author 2" genre "Horror" price 15 rating 4.0
HSET **username:**book:3 title "Book C" author "Author 1" genre "Fiction" price 12 rating 4.7
HSET **username:**book:4 title "Book D" author "Author 3" genre "Fiction" price 8 rating 3.9
HSET **username:**book:5 title "Book E" author "Author 2" genre "Horror" price 20 rating 4.8

1) Count the number of books for each genre
2) Count the number of books for each author
3) Count the number of fiction books for each author
4) Count the number of books for each combination of author and genre

Exercise 9 – Aggregation

1) Calculate the total price of all books.

2) Calculate the average rating of all books.

3) Find the minimum and maximum prices for all books.

4) Count the number of books in each genre.

5) Calculate the average rating and count of books for each author.

6) Find books with a rating greater than 4 and sort them by author.

7) Define books in the "Fiction" genre with a price greater than or equal to 10.

Information about students and their journeys is stored in JSON.

Insert it into Redis. Search:

1) Find all users who have visited 'Roma'.

2) Find all users who have visited 'Italy'.

3) Find all users who have traveled in the year 2016.

4) Find all users with the name 'Alice Brown'.

5) Count the number of users who have visited 'Italy'.