Institut Polytechnique de Paris

DataAI

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Architectures for Big Data: Lab 1 - Redis

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Submission deadline: Monday, October 17, 2022 at 23:55:00 (Paris time).

1 Lab organization[2]

1.1 Key-value stores recall

Please find the presentation under `Lab 1 slides` link at Moodle.

1.2 Redis setup

1. Download and install Redis following instructions at `https://redis.io/docs/getting-started/`.

2. Launch Redis and check if it works.

If you use Windows as your operating system, please consider installing a virtual machine (e.g., VirtualBox) and a Linux distribution onto it (some popular distros: Ubuntu, Linux Mint, Debian, Fedora/CentOS, Arch Linux) so that you can go through the lab within the virtual environment.

1.3 Redis tutorial

To warm up, start with a tutorial on Redis. Learn some basic commands at `https://try.redis.io`.

1.4 Assignment and questions

Please read the assignment description in the next section. If you have any questions about the lab or on the course material, don't hesitate to ask them during the lab session, via Moodle or over email (don't wait until the last moment).

2 Assignment

With the help of a programming language interface to Redis, write a toy application of a database of books that can be borrowed in a library. You can use any supported language among the ones listed at `https://redis.io/docs/clients/`.

2.1 Application specification

1. All books in the library database have an ISBN, a title, an author and a number of copies.

2. Books may also have other properties, e.g., language, publication year, edition... (up to you).

3. Create a publish-subscribe news system (see `https://redis.io/topics/pubsub`) that:

   (a) on the **publisher** side lets the user add a book to the library, indexes it by the keywords in its description, publishes a channel for each indexed keyword, and emits a news message containing the newly published book ID;

   (b) on the **subscriber** side enables the user to subscribe to news channels matching certain keywords, retrieve a book from a news by the ID, and show the full book entry from the database; separately the user can borrow or return a book: the system needs to check if the book is available;

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[2] All lab materials based on previous course editions courtesy of Ioana Manolescu, Silviu Maniu and Pawel Guzewicz (with some changes)

(c) makes books expire after a while (if no one borrows the book): these are no longer available to borrow;

(d) if someone borrows a book (by, e.g., setting a certain field in the database), makes the book refresh its expiry date.

To understand better how to interact with some commands through Redis API, you can look at the tutorial implementing a Twitter clone in a PHP client at `https://redis.io/docs/reference/patterns/twitter-clone/`.

2.2 Report

Write a short report on your implementation. It should include the following elements.

1. Setup information: which programming language did you use, what are the necessary steps to use a Redis client (e.g., for python you need to run `pip install redis` to install Redis package), and most importantly, **how to run your code**.

2. Supported scenarios: how to publish a book, how to subscribe to a channel, how to borrow/return books, how does the client detect an expired book, etc.

3. An example of the program execution per scenario: terminal screenshots, a list of commands or a script along with their outputs.

2.3 Submission guidelines

Please follow the submission rules and guidelines available at Moodle.

Some tips to help you in your work:

1. **Version Control:** It is strongly recommended to use a version control system like git, svn, etc. to save your work to a cloud. Ensure that the repository is private so that your code is not accessible by others. Not having a backup is not acceptable as an excuse for late/no submission.

2. **Time Management:** Do not wait until the last moment/day for working on the assignment. Since late submissions will incur penalties, ensure that you start early and plan your work well.