

EXTRA CREDIT PROJECT REDIS

BIA 810 - STEVENS INSTITUTE OF TECHNOLOGY



Submitted by

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INTRODUCTION

Redis is an open source (BSD licensed), in-memory data structure store, used as database, cache and message broker. It supports data structures such as strings, hashes, lists, sets, sorted sets with range queries, bitmaps, hyperloglogs and geospatial indexes with radius queries¹.

DATA TYPES IN REDIS

NAME	DESCRIPTION
Strings	a sequence of binary safe bytes up to 512 MB
Hashes	a collection of key value pairs
Lists	an in-insertion-order collection of strings
Sets	a collection of unique strings with no ordering
Sorted Sets	a collection of unique strings ordered by user defined scoring

Among these data types, **Hashes** can be used to store items of each row with unique identifier (Primary key). **Sets** can be used to store all the unique identifiers of a table and map them with relation (table) name.

OBJECTIVES

1. To Install Redis on Windows
2. Program that gets as input (in the command line) the name of a relation's specification file and inserts relation's data into Redis in an appropriate format.
3. program that gets as input (in the command line) the name of a query's specification file and prints out the results, separated by ","

¹ <http://redis.io/>

SOFTWARE TOOLS

1. Download and install Redis for Windows from MSOpenTech page on [github](https://github.com/MSOpenTech/redis/releases)²
2. Download and install Python2.7 for Windows from [Python.org](https://www.python.org/downloads/windows/)³

PROGRAM

Program contains three major functions

1. **Create** - reads from the specification file and inserts into the Redis
2. **Query** - function reads query specification file and prints out the result
3. **Handy** - this function helps both create and query functions

FORMAT OF INPUT FILES

Above functions and entire program was built around pre-determined format of input specification files.

INSERT - SPECIFICATION FILE

- first line contains only **table's name**
- second line contains the **primary key's name** - assume a single attribute
- the rest of the attributes are in a single line each
- a line containing the character ';' -
- one or more lines, representing **records**, delimited by the character ";"
- assume all attributes are of type string

QUERY - SPECIFICATION FILE

- first line (SELECT): a list of **relation_name.attribute_name**, delimited by the character ","
- second line (FROM): a list of relation names, delimited by the character ","
- third line (WHERE): a very simple condition, consisting only of **AND, OR, =, <>, > and <**

² <https://github.com/MSOpenTech/redis/releases>

³ <https://www.python.org/downloads/windows/>

RESULTS

```
C:\Python27\python.exe
Enter 1 to add relation schema and values
Enter 2 to Query
Enter 3 to Exit
Enter Choice: 1
Enter path of relation's file: relation.txt
['12938', 'Hydras 28, Athens', 'Papadopoulos', 'Nikos', '42']
['18298', 'Kifisias 33, Marousi', 'Nikolaou', 'Maria', '34']
['81129', 'Alamanas 44, Petralona', 'Panagiotou', 'Dimitris', '29']
['87623', 'Spain 34, Kumbij', 'Jetix', 'Timon', '40']
['76543', 'Lined 23, Poinyh', 'Jetix', 'Pumba', '45']
Data added Successfully
Enter 1 to add relation schema and values
Enter 2 to Query
Enter 3 to Exit
Enter Choice: 2
Enter path of query file: query2.txt
['Dimitris', 'Panagiotou', '29']
Enter 1 to add relation schema and values
Enter 2 to Query
Enter 3 to Exit
Enter Choice:
```

DATA USED IN THE RESULT

Relation.txt

Student

SSN

FName

LName

Address

Age

;

12938;Nikos;Papadopoulos;Hydras 28, Athens;42

18298;Maria;Nikolaou;Kifisias 33, Marousi;34

81129;Dimitris;Panagiotou;Alamanas 44, Petralona;29

87623;Timon;Jetix;Spain 34, Kumbij;40

76543;Pumba;Jetix;Lined 23, Poinyh;45

Query2.txt

Student.FName,Student.LName,Student.Age
Student,Grade
Student.SSN=Grade.SSN AND Student.Age<30

REFERENCES

1. http://www.python-course.eu/sets_frozensets.php
2. <https://redislabs.com/ebook/redis-in-action/part-2-core-concepts-2/chapter-3-commands-in-redis/3-4-hashes>
3. <https://redislabs.com/ebook/redis-in-action/part-2-core-concepts-2/chapter-3-commands-in-redis/3-3-sets>
4. <https://channel9.msdn.com/Blogs/Interoperability/Redis-on-Windows-Getting-Started>
5. <http://liamkaufman.com/blog/2012/06/04/redis-and-relational-data/>
6. <https://docs.python.org/2/tutorial/inputoutput.html>
7. <https://msopentech.com/opentech-projects/redis/>
8. <https://matt.sh/introduction-to-redis-data-types>