Lab 1 – Redis

Alex Dembele

I. Description

This project is composed of two scripts. *PublisherSubscriber.py* and *FillingLibrary.py*

a) PublisherSubscriber

This code implements two classes with their methods:
BookPublisher and BookSubscriber.

BookPublisher create an instance of a publisher, it contains two methods

.add_book()	add a book to the library with the timer
.delete_book()	delete a book from the library

BookSubscriber create an instance of a subscriber, it contains several methods

.listen_for_news()	Listen if something changes in the channel
.find_book_ISBN()	Book research with ISBN
.find_book_title()	Book research with title
.show_books()	Show the books that the subscriber has borrowed
.subscribe_to_channel()	Enable to subscribe to a new channel
.borrow_a_book()	Borrow a book if it exists
.return_a_book()	Return a book
.get_all_books()	Show all books in base

b) Filling Library

This code does a preliminary filling of the library.
A book in the library is a dictionary:
{'key': {Title, channel, author, number, language, year}}
The key is the ISBN.

c) Expiration

As asked, this code delete books after a certain expiration time that you can change.
It is automatically done thanks to **redis.expire()**

II. How to run the code

I used Python (on Pyzo) to implement redis. In order to run the code, install python3 and run

pip install redis . You need to start a redis server with the command **redis-server** in linux terminal. Then open python3.

a) Preliminary command

Run *PublisherSubscriber.py.*

To create a publisher, use the command: **publisher = BookPublisher('Channel')**
Channel is the name of the channel on which the publisher will post message.
A publisher can publish a book in another channel but do not use it, I do not guarantee the result after.

To create a subscriber, use the command: **subscriber = BookSubscriber('Channel')**
Channel is the name of the first channel to which the subscriber is subscribed.

To fill the library with some books, just run *FillingLibrary.py.*

To change expiration time, change it in the code *PublisherSubscriber.py*

b) Publisher Commands

To add a book, use your publisher:
publisher.add_book(ISBN,channel,title,author,langage,year[,number])

This method will add a book and publish a message on the correct channel.
If the book already exists, it will increase the number, otherwise it will create a book, in both case it initializes the expiration time.

To delete a book, use your publisher: **publisher.delete_book(ISBN)**
This method will delete the book corresponding to the ISBN and publish a message on the correct channel.

c) Subscriber Commands

To listen for news with a subscriber, use: **subscriber.listen_for_new()**
It prints if there is an update.

To find a book with ISBN, use **subscriber.find_book_ISBN(ISBN)**
It prints wheter the book is in the library

To find a book with title, use **subscriber.find_book_title(title)**
It prints wheter the book is in the library

To see what book you have, use **subscriber.show_books()**
It prints the books that you have borrowed

To borrow a book, use **subscriber.borrow_a_book(ISBN)**
It reset the expiration time of the book. It checks if the book is in the library and set the number.

To return a book, use **subscriber.return_a_book(ISBN)**
It checks if you have the book, reset the expiration time and reset the number.

To subscribe to a new channel, use **subscriber.subscribe_to_channel(channel)**

To see all the books store in the library, use **subscriber.get_all_books()**
It prints all the books, even the books with a number of 0.

III. Example

Launch a redis server :	$ redis-server
Open a new terminal, and launch	$python3 FillingLibrary.py
Switch to python	$python3
Import Classes	>>> from PublisherSubscriber import *

Play with the program:

>>>publisher = BookPublisher('Sport')

>>>subscriber = BookSubscriber('Sport')

>>>subscriber.get_all_books()

>>>subscriber.find_book_title('Handball')

>>>subscriber.find_book_ISBN('3001')

>>>subscriber.borrow_a_book('3001')

>>>subscriber.show_books() # To see the change

>>>subscriber.get_all_books() # To see the change

>>>subscriber.return_a_book('3001')

>>>subscriber.show_books() # To see the change

>>>subscriber.get_all_books() # To see the change

```
>>> publisher = BookPublisher('Sport')
>>> subscriber = BookSubscriber('Sport')
>>> subscriber.get_all_books()
{'1010': {'Title': 'Running like Forest', 'channel': 'Sport', 'author': 'Usain Bolt', 'number': '1', 'language': 'English', 'year': '1994'}, '3004': {'Title': '
Magic electricity', 'channel': 'Science', 'author': 'Alessandro Volta', 'number': '1', 'language': 'Italian', 'year': '1799'}, '3009': {'Title': 'Modelization i
n aeronautics', 'channel': 'Science', 'author': 'Louis-Hadrien Gros', 'number': '3', 'language': 'English', 'year': '2019'}, '1002': {'Title': 'Basketball', 'ch
annel': 'Sport', 'author': 'Jimmy Butler', 'number': '1', 'language': 'English', 'year': '2003'}, '3002': {'Title': 'Molecular Gastronomy', 'channel': 'Science'
, 'author': 'Einstein Etchebest', 'number': '1', 'language': 'German', 'year': '2008'}, '4001': {'Title': 'Immortal', 'channel': 'Novel', 'author': 'Chuck Norri
s', 'number': '1', 'language': 'English', 'year': '1980'}, '3005': {'Title': 'Buffalo Anatomy', 'channel': 'Science', 'author': 'David Crocket', 'number': '1',
'language': 'English', 'year': '1802'}, '1001': {'Title': 'Handball', 'channel': 'Sport', 'author': 'Dika Mem', 'number': '3', 'language': 'French', 'year': '20
18'}, '3001': {'Title': 'Terraforming Mars !?', 'channel': 'Science', 'author': 'Elon Musk', 'number': '1', 'language': 'English', 'year': '2019'}, '1005': {'Ti
tle': 'Rugby History', 'channel': 'Sport', 'author': 'Jonah Lomu', 'number': '2', 'language': 'Maori', 'year': '1995'}, '2007': {'Title': 'Ink Mastering', 'chan
nel': 'Art', 'author': 'Freaky Hoody', 'number': '1', 'language': 'English', 'year': '2022'}, '3008': {'Title': 'Finance model and equation', 'channel': 'Scienc
e', 'author': 'Christopher Tks', 'number': '10', 'language': 'Chinese', 'year': '2020'}, '1009': {'Title': 'Swimming like a butterfly : Really ?', 'channel': 'S
port', 'author': 'Michael Phelps', 'number': '1', 'language': 'English', 'year': '1999'}, '1004': {'Title': 'Tennis', 'channel': 'Sport', 'author': 'Roger Feder
er', 'number': '5', 'language': 'German', 'year': '2005'}, '3006': {'Title': 'Climate Change', 'channel': 'Science', 'author': 'Greta Thunberg', 'number': '4',
'language': 'English', 'year': '2015'}, '2001': {'Title': 'Street Art', 'channel': 'Art', 'author': 'Banksy', 'number': '3', 'language': 'English', 'year': '200
2'}, '4003': {'Title': 'Orientation Adventure', 'channel': 'Novel', 'author': 'Zoro Roronoa', 'number': '1', 'language': 'English', 'year': '1997'}, '2002': {'T
itle': 'Smiling Face', 'channel': 'Art', 'author': 'Mona Lisa', 'number': '1', 'language': 'Italian', 'year': '1509'}, '1008': {'Title': 'Calisthenic basics', '
channel': 'Sport', 'author': 'Simone Biles', 'number': '1', 'language': 'English', 'year': '2013'}, '2003': {'Title': 'Modern Art', 'channel': 'Art', 'author':
'Monet Claude', 'number': '1', 'language': 'French', 'year': '1902'}, '2005': {'Title': 'Frozen human', 'channel': 'Art', 'author': 'Pompei Volcano', 'number':
'1', 'language': 'Italian', 'year': '79'}, '1003': {'Title': 'Football', 'channel': 'Sport', 'author': 'Pele', 'number': '1', 'language': 'Brasilian', 'year': '
1980'}, '1006': {'Title': 'F1 superstar', 'channel': 'Sport', 'author': 'Lewis Hamilton', 'number': '1', 'language': 'English', 'year': '2006'}, '3007': {'Title
': 'Dealing with nuclear waste', 'channel': 'Science', 'author': 'Sebastien Quinn', 'number': '1', 'language': 'English', 'year': '2023'}, '1007': {'Title': 'Ho
w to become Athletic', 'channel': 'Sport', 'author': 'The Mountain', 'number': '2', 'language': 'Icelandic', 'year': '2009'}, '4002': {'Title': 'Canice Glowen',
 'channel': 'Novel', 'author': 'Edmond Fauret', 'number': '2', 'language': 'French', 'year': '1869'}, '3003': {'Title': 'Apple Gravity', 'channel': 'Science', '
author': 'Isaac Newton', 'number': '3', 'language': 'English', 'year': '1703'}, '2004': {'Title': 'Carving a curve', 'channel': 'Art', 'author': 'Robin Rodin',
'number': '1', 'language': 'English', 'year': '1911'}, '2006': {'Title': 'Decorate your house', 'channel': 'Art', 'author': 'Stephane Plaza', 'number': '6', 'la
nguage': 'French', 'year': '2017'}}
>>> subscriber.find_book_title('Handball')
1001 {'Title': 'Handball', 'channel': 'Sport', 'author': 'Dika Mem', 'number': '3', 'language': 'French', 'year': '2018'}
End of search
>>> subscriber.find_book_ISBN('3001')
3001  :  {'Title': 'Terraforming Mars !?', 'channel': 'Science', 'author': 'Elon Musk', 'number': '1', 'language': 'English', 'year': '2019'}
```

```
>>> subscriber.borrow_a_book('3001')
This book is available
>>> subscriber.find_book_ISBN('3001')
3001  :  {'Title': 'Terraforming Mars !?', 'channel': 'Science', 'author': 'Elon Musk', 'number': '0', 'language': 'English', 'year': '2019'}
>>> subscriber.show_books()
['3001']
>>> subscriber.return_a_book('2001')
You don't have this book
>>> subscriber.return_a_book('3001')
You returned this book
>>> subscriber.show_books()
[]
>>> subscriber.find_book_ISBN('3001')
3001  :  {'Title': 'Terraforming Mars !?', 'channel': 'Science', 'author': 'Elon Musk', 'number': '1', 'language': 'English', 'year': '2019'}
>>>
```

>>>publisher.add_book(‘1011’,’Sport’,’VolleyBall’,’Earvin NGapeth’,’French’,’2016’)

>>>subscriber.listen_for_new() # To see the change

>>>subscriber.get_all_books() # To see the change

>>>publisher.delete_book(‘1011’)

>>>subscriber.listen_for_new() # To see the change

>>>subscriber.get_all_books() # To see the change

```
>>> publisher.add_book('1011','Sport','VolleyBall','Earvin NGapeth','French','2016')
New book added : VolleyBall
This book is new
>>> subscriber.listen_for_news()
Nothing new
>>> subscriber.listen_for_news()
New book added : VolleyBall
>>> subscriber.listen_for_news()
Nothing new
>>> subscriber.listen_for_news()
Nothing new
>>> subscriber.find_book_ISBN('1011')
1011  :  {'Title': 'VolleyBall', 'channel': 'Sport', 'author': 'Earvin NGapeth', 'number': '1', 'language': 'French', 'year': '2016'}
>>> publisher.delete_book('1011')
Book 1011 deleted.
>>> subscriber.find_book_ISBN('1011')
1011  :  {}
>>> subscriber.find_book_ISBN('1011')
1011  :  {}
>>> subscriber.listen_for_news()
Book deleted: 1011
>>> subscriber.listen_for_news()
Nothing new
```