Question 1

1. The address in user collection is changed into an array to solve the problem of multiple address. And it will be easy to get all data of address to be created as a nested collection.
2. Publisher is built as a separate collection, because it will be helpful if we want to add more publishers in the future. It is possible we currently don’t have any books in our library published by this new publisher, but we still want to have information about this publisher for statistic use. Also, MongoDB has 16MB size limitation for each collection (BSON document). A library will has so much data, and will keep increasing. Moreover, when adding books with same publisher into database, we only need to enter the information of publishers once.
3. The publisher in book collection is changed into an array to solve the problem that a book may have multiple publishers.
4. The address in publish collection is changed into an array to solve the problem of multiple address.
5. The subjects in book collection is changed into an array to solve the problem of multiple subjects.
6. The note in book collection is changed into an array to solve the problem of multiple note
7. The availability in book collection and active in user collection are changed into Boolean type to make more sense and convince in use
8. All dates are changed from String type into Date type to make more sense and convince in use
9. Zip codes are changed from int type into string to make more sense and avoid missing leading zeros.

Question 2

Inserted by load() function, json files will be provided.

**(js file can be provided upon request.)**

Question 3

db.book.find().pretty()

**(.pretty() is optional)**

Question 4

db.book.find({author:{ $ref : "author", $id : db.author.findOne({"first\_name" : "Danielle","last\_name" : "Steel"}).\_id}}).pretty()

Question 5

db.user.find({dateOfCreation : {$gt: new Date("2014-12-15")}, "addresses.city" : "Boston"}).pretty()

Question 6

db.book.find({$where : "this.publisher.length > 1 "}).pretty()

Question 7

db.book.find({$where : "this.note.length > 0 "}).pretty()

Question 8