Team 12 Library Management System - Database Documentation

Overview:
- Databases are stored in textfiles (*.txt)
- Each entry is on a seperate line
- For each entry, different fields are separated by the * symbol
  - E.g. Jacob*Cuke*21*3rd Year*Computer Science

User Database:

Filename: UserDatabase.txt

Field Order:
1. User ID
2. User Type
3. First Name
4. Last Name
5. Email
6. Password
7. List of Borrowed Items
8. List of Reserved Items
9. Fine Amount
10. Blacklisted Flag

Field Descriptions

User ID: 8 digit <u>unique</u> identification number
Possible Values: Any permutation of 8 numbers
Example: 30045721*...

User Type: Specifies the permission level of the user
Possible Values: STUDENT, FACULTY, CLERK, STAFF
Example: 30026757*STUDENT*...

First Name/Last Name: User's first and last name
Possible Values: Any string

Example: …*student*Steve*Vai*...

Email: User's email address used to log into the system
Possible Values: String containing a valid email address
Example: …*Joe*Satriani*joe.satriani@mountroyal.ca*...

Password: Password used to log into the system
Possible Values: Any string
Example: …*dave.mustaine@mountroyal.ca*thisisacrappypassword*...

List of Borrowed Items: List of items a user currently has checked out, referenced by each item's unique identification number, and the due date of each item. Each entry is separated by a comma (,)
Each entry in the list is 14 digits long. The first 6 digits are the item's unique ID number, followed by the due date in the following format: DDMMYYYY
If no items are currently checked out by the user, value is NULL
Possible Values: 14 digit numbers separated by commas, NULL
Examples: …*passw0rd123*28076225122019,10043201042020*...
         …*passw0rd*NULL*...

In the first example, user has rented out 2 items with ID numbers 280762 and 100432, which are due on 25/12/2019 and 01/04/2020 respectively.

List of Reserved Items: List of items a user currently has on their reserved list, referenced by each item's unique identification number. If they are currently at the front of the reserve queue and no one else has the item checked out, then the date by which they must pick up the book is included in this entry. Each entry is separated by a comma (,)
Each entry in the list is 6 or 14 digits long. The first 6 digits are the item's unique ID number, followed by the pickup-by date in the following format: DDMMYYYY if applicable
If no items are currently reserved by the user, value is NULL
Possible Values: 6 / 14 digit numbers separated by commas, NULL
Example: …*300897206082019,123456*...
         …*NULL*...

In this example, this user has reserved 2 items with ID numbers 300897 and 123456. The first item must be picked up by 06/08/2019 and they are still waiting to get to the front of the queue for the second item.

Fine Amount: Amount owed in fines by the user
Possible Values: Any positive integer
Example: …*100*...

Blacklist Flag: Boolean value, indicating whether or not the user is blacklisted
Possible Values: true, false
Examples: …*100*true
　　　　　…*5*false

Item Database

Filename: ItemDatabase.txt

Field Order:
1. Item ID
2. Item Type
3. Title
4. Author <Book / Online Publication> / Production Company <DVD>
5. Location in Library <Physical Item> / Item Data <Non-Physical Item>
6. Current Status <Physical Items Only>
7. Current Holder <Physical Items Only>
8. Reserve Queue <Physical Items Only>

Field Description

Item ID: 6 digit <u>unique</u> identification number
Possible Values: Any sequence of 6 digits
Example: 100238*...

Item Type: Specifies the type of item, used in determining what actions can be performed on the item, and what is stored in each field in the database. "online" refers to any online publication that can be accessed via a link. To be implemented later: ebook.
Possible Values: BOOK, DVD, ONLINE
Examples: 100238*BOOK*...
　　　　887612*DVD*...

Title: Item's Title
Possible Values: Any string
Example: …*BOOK*Software Engineering for Dummies*...

Author / Producer: In the case of books and online publications, this field contains the author. For DVDs, this field contains the producer's name. If there is more than one author/producer (this is especially true in the case of research papers) the authors names are separated with a comma (,).
Possible Values: Any string
Examples: …*A Song of Ice and Fire: Game of Thrones*George R.R. Martin*...
          …*Man with Superpowers Fights Bad Guy 32*Marvel Studios*...
…*Three-valued bounded model checking with cause-guided abstraction refinement*Nils Timm,Stefan Gruner*...

Location in Library / Item Data: Another dynamic field that changes based on item type. For items that physically exist, this field contains the section in the library where it is located. For non-physical items, namely online publications (and ebooks to be implemented in the future) this field contains the link to that publication.
Possible Values: Location in library **or** web link
Examples: …*BOOK*Harry Potter and the Philosopher's Stone*J.K. Rowlings*Fantasy*...
…*ONLINE*How to Waste Many Hours a Day*Mark Zuckerberg*https://facebook.com*...

Current Status: Describes the current status of the item. Any item is available is no one has checked it out or reserved it, and unavailable when someone has checked it out or at least one other person has reserved it. One additional status is the restricted status, which means that the book cannot be checked out, but instead must be used within the library. Since online publications are only viewed, and not checked out, this field is not needed for the "online" item type.
Possible Values: AVAILABLE, UNAVAILABLE, RESTRICTED
Example: …*J.K. Rowlings*Fantasy*AVAILABLE*...

Current Holder: Contains the unique User ID of the user who currently has the item checked out. If the item is currently not checked out then the value is NULL. Since online publications are only viewed, and not checked out, this field is not needed for the "online" item type.
Possible Values: 8 digit user ID, NULL

Example: …*J.K. Rowlings*Fantasy*UNAVAILABLE*30030179*...

Reserve Queue: Contains the queue of students who have reserved this item. The students are referenced by their ID numbers and separated by a comma (,)
Queue is a First In First Out queue. Entries are added at the tail (right) and removed from the head (left).
When the queue is empty, value is NULL
Possible Values: List of 8 digit user IDs separated by commas, NULL
Example: …*J.K. Rowlings*Fantasy*UNAVAILABLE*30030179*30087631,3002445
            …*George R.R. Martin*Fantasy*AVAILABLE*NULL*NULL