

期中实验 shell 脚本综合编程实验

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一、实验目的

1. 练习 shell 脚本编程

二、实验要求

1. 填写实验报告，请将关键命令及其结果进行截图(请确保截图中的文字清晰可见)
2. 导出为 pdf 文件，文件名为用户名-姓名-lab08.pdf，在规定截止时间之前上传作业)
3. 以下步骤中所有 s01 请换成你自己的用户名，01 请换成你自己用户名中的序号。

三、实验步骤

1. 用 shell 脚本实现一个个人图书管理系统，脚本名为 s01-library，为了尽可能重用和精简代码，请将重复功能写成函数，要求所有函数名形如 s01-funcname。

(以下仅为最基本的界面及功能要求，鼓励大家在此基础上自行设计更美观的界面和更丰富、完善的功能，图书数据文件的格式字段等也可以根据需要自行修改和扩充，优秀作品有加分!!!)

说明：

(1) 该系统用一个文本文件 books.db (该文件初始并不存在，要求由系统判断其是否存在，若不存在则自动创建) 保存按照 bookID 从小到大排序的图书信息，每行为一本图书的信息，字段之间用%分隔，每个字段如下：

第 1 个字段：书号(bookID)，8 位 (下面系统截图中的 bookID 为 5 位，但要求同学们系统中写的书号为 8 位，形如 s01-00001)，每增加一本书时要求自动生成新书的 bookID。

第 2 个字段：书名(title)

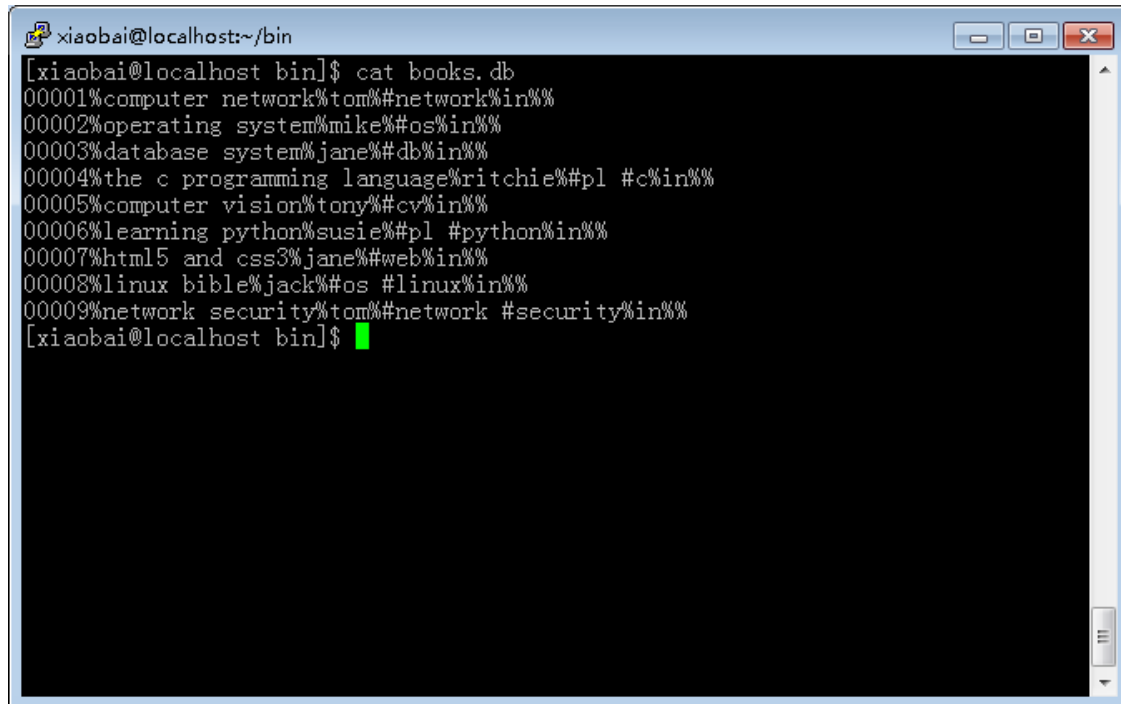
第 3 个字段：作者(author) (多个作者用, 隔开)

第 4 个字段：标签(tag) (每个标签以#开头，多个标签用空格隔开)

第 5 个字段：状态(status)：in 表示在库，out 表示借出

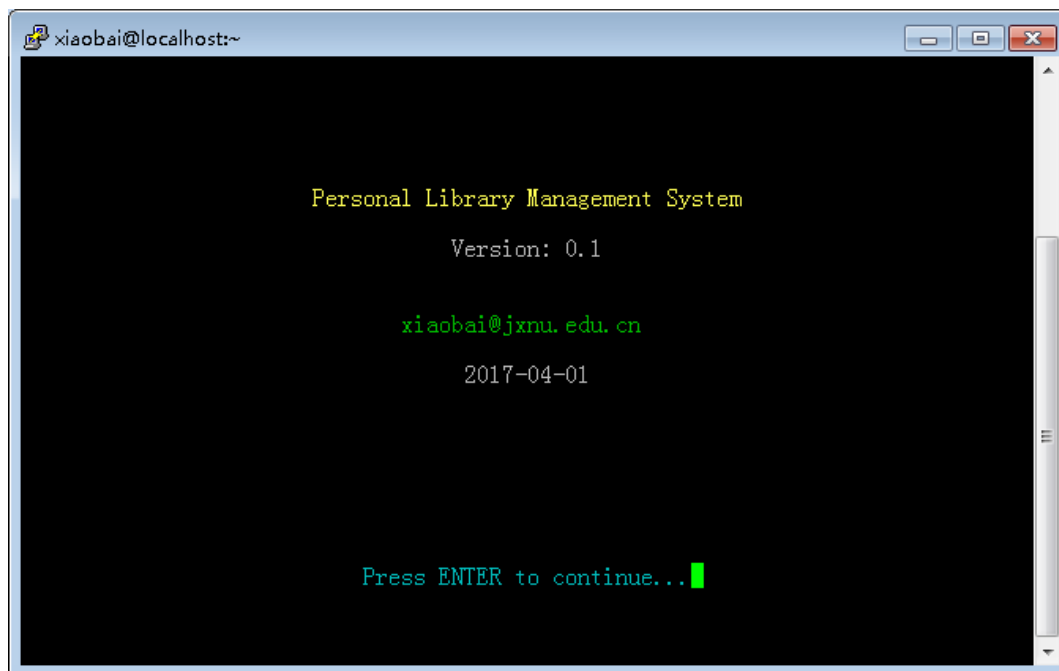
第 6 个字段：借书人(bname)：如果 status 值为 in，则为空，否则为借书人

第 7 个字段：借出时间(btime)：格式为 2017-04-01，如果 status 值为 in，则为空，否则为借出日期



```
xiaobai@localhost:~/bin
[xiaobai@localhost bin]$ cat books.db
00001%computer network%tom%#network%in%%
00002%operating system%mike%#os%in%%
00003%database system%jane%#db%in%%
00004%the c programming language%ritchie%#pl #c%in%%
00005%computer vision%tony%#cv%in%%
00006%learning python%susie%#pl #python%in%%
00007%html5 and css3%jane%#web%in%%
00008%linux bible%jack%#os #linux%in%%
00009%network security%tom%#network #security%in%%
[xiaobai@localhost bin]$
```

(2) 脚本运行后显示如下封面，按回车键后进入系统主菜单：



```
xiaobai@localhost:~
Personal Library Management System
Version: 0.1
xiaobai@jxnu.edu.cn
2017-04-01
Press ENTER to continue...
```

(3) 用户根据可以从主菜单选择进入具体功能模块（如果用户输入无效（如输入 9）则显示错误信息，并让用户重新选择，后续操作类似处理）：

```
xiaobai@localhost:~  
  
Main Menu  
  
1: Show books  
2: Find books  
3: Add books  
4: Edit infomation of books  
5: Check out books  
6: Check in books  
7: Delete books  
q: Exit  
  
Please enter your choice[1-7 or q]: █
```

(4) 显示图书信息，可按 bookID、title、author 等字段进行排序后显示

```
xiaobai@localhost:~  
  
Show books  
  
1: Sort by ID  
2: Sort by Title  
3: Sort by Author  
q: Return Main Menu  
  
Enter your choice[1-3 or q]: █
```

```
xiaobai@localhost:~/bin
ID: 00001
Title: computer network
Author: tom
Tags: #network
Status: in

ID: 00002
Title: operating system
Author: mike
Tags: #os
Status: in

ID: 00003
Title: database system
Author: jane
Tags: #db
Status: in

ID: 00004
Title: the c programming language
Author: ritchie
Tags: #pl #c
Status: in
:
```

(5) 查找图书，可组合 bookID、书名、作者、标签、状态、借书人等查询条件进行图书查找，并可进行多次查找

```
xiaobai@localhost:~/bin

Find books

ID:
Title:
Author:
Tags: #linux
in/out:
Borrower:
Are you sure? [y(es)/n(o)/c(ancel)]: y
```

```
xiaobai@localhost:~/bin

ID: 00008
Title: linux bible
Author: jack
Tags: #os #linux
Status: in

(END)
```

```
xiaobai@localhost:~/bin

Find books

ID:
Title:
Author:
Tags: #linux
in/out:
Borrower:
Are you sure? [y(es)/n(o)/c(ancel)]: y
Any book to find? [y/n]:
```

(6) 添加图书，新书的 bookID 必须自动生成，且要求可连续添加多本图书

```
xiaobai@localhost:~/bin

Add books

ID: 00010
Title: 
Author:
Tags:
```

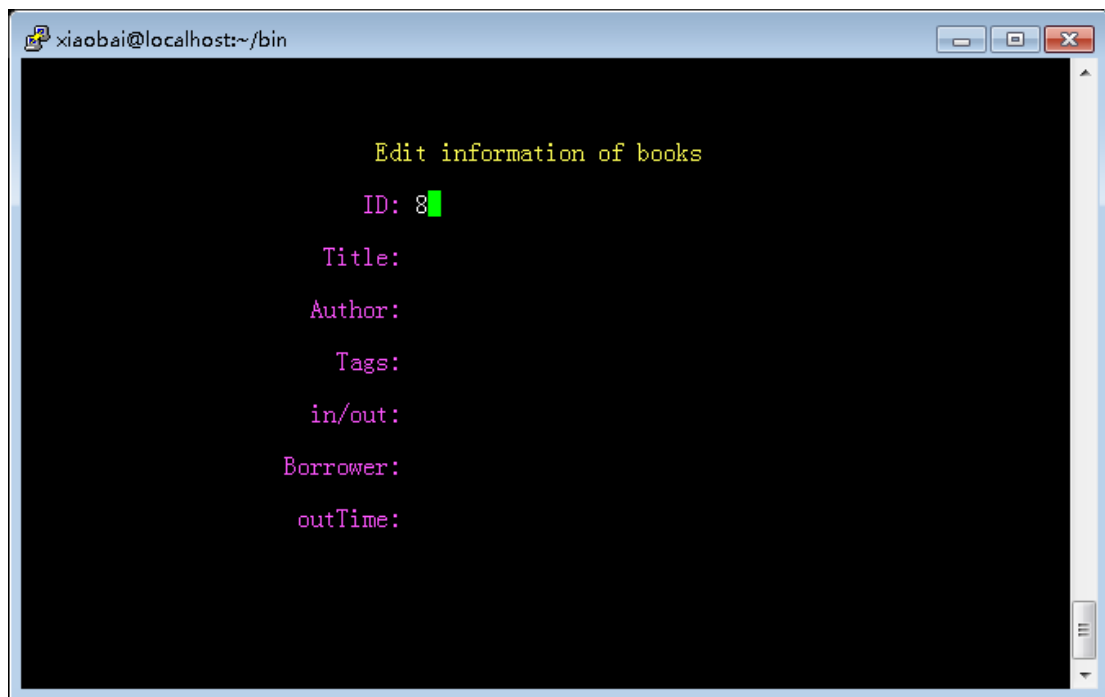
```
xiaobai@localhost:~/bin

Add books

ID: 00010
Title: centos linux
Author: mary
Tags: #linux #centos

Are you sure? [y(es)/n(o)/c(ancel)]: y
Success, any book to add? [y/n]: n
```

(7) 编辑图书信息，用户通过输入短的书号(如只需输入 8 而不是 00008)选择待编辑的图书，如果该图书尚不存在则提示图书不存在并可让用户重新选择，若存在则显示该图书当前的信息

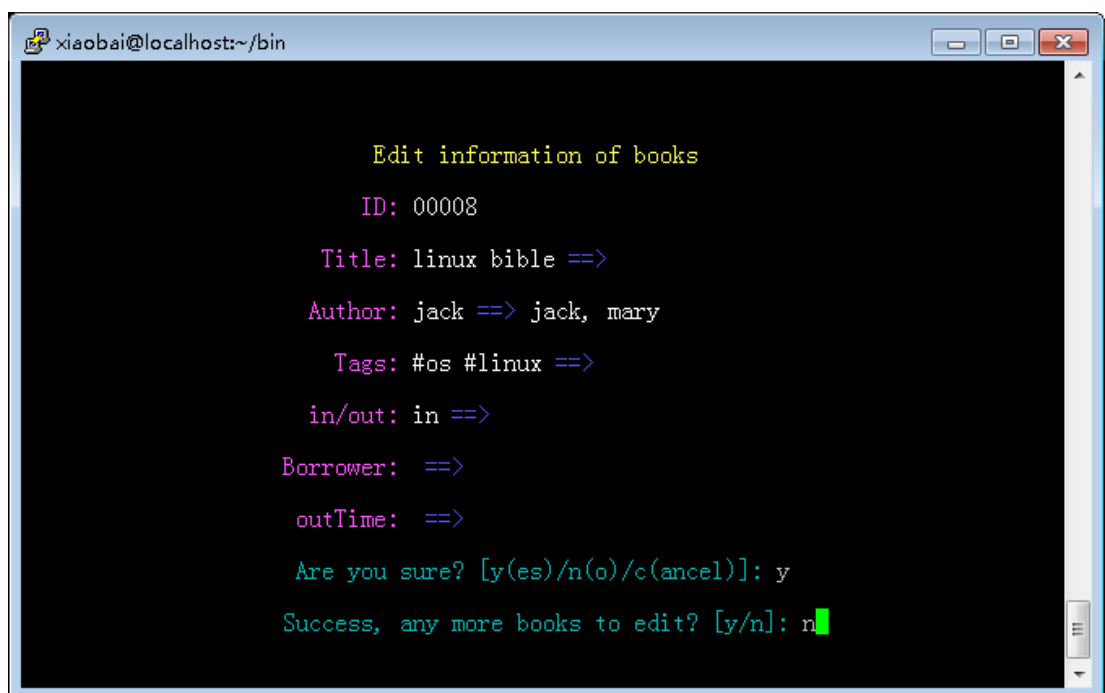


```
xiaobai@localhost:~/bin

Edit information of books

ID: 8
Title:
Author:
Tags:
in/out:
Borrower:
outTime:
```

在图书每个字段的后面可以输入新的字段值，如果直接回车则表示不修改该字段，要求支持连续修改多本图书。



```
xiaobai@localhost:~/bin

Edit information of books

ID: 00008
Title: linux bible ==>
Author: jack ==> jack, mary
Tags: #os #linux ==>
in/out: in ==>
Borrower: ==>
outTime: ==>
Are you sure? [y(es)/n(o)/c(ancel)]: y
Success, any more books to edit? [y/n]: n
```

(8) 借出图书，通过输入短的书号选择待借出的书，如果该书不存在或已经被借出，则提示并允许用户重新选择借出别的书，若该书存在则显示该书的信息，并等待用户填写借书人的姓名，允许用户连续借出多本书。

```
xiaobai@localhost:~/bin

Check out books

ID: 9
Title:
Author:
Tags:
in/out:
Borrower:
outTime:
```

```
xiaobai@localhost:~/bin

Check out books

ID: 00009
Title: network security
Author: tom
Tags: #network #security
in/out: in
Borrower:
outTime:
```



```
xiaobai@localhost:~/bin

Check out books

ID: 00009

Title: network security
Author: tom
Tags: #network #security
in/out: in
Borrower: mary
outTime:

Are you sure? [y(es)/n(o)/c(ancel)]: y
```

完成借出操作后，要更新并显示新的图书信息

```
xiaobai@localhost:~/bin

Check out books

ID: 00009

Title: network security
Author: tom
Tags: #network #security
in/out: out
Borrower: mary
outTime: 2017-04-14

Are you sure? [y(es)/n(o)/c(ancel)]: y

Success, any more books to check out? [y/n]: n
```

(9) 归还图书，通过输入短的书号选择归还的书，如果该书不存在或已经被归还，则提示并允许用户重新选择归还别的书，若该书存在则显示该书的信息，完成归还操作后要更新并显示新的图书信息，允许连续归还多本书。

```
xiaobai@localhost:~/bin

                                Check in books

ID: 9
Title:
Author:
Tags:
in/out:
Borrower:
outTime:
```

```
xiaobai@localhost:~/bin

                                Check in books

ID: 00009
Title: network security
Author: tom
Tags: #network #security
in/out: out
Borrower: mary
outTime: 2017-04-14
Are you sure? [y(es)/n(o)/c(ancel)]: y
```

```
xiaobai@localhost:~/bin

Check in books

ID: 00009

Title: network security
Author: tom
Tags: #network #security
in/out: in
Borrower:
outTime:

Are you sure? [y(es)/n(o)/c(ancel)]: y
Success, any more books to check in? [y/n]: n
```

(10) 删除图书，通过输入短的书号选择待删除的书，如果该书不存在，则提示并允许用户重新选择删除别的书，若该书存在则显示该书的信息，完成删除操作（从 `books.db` 文件中删除相应行，其他书的 `bookID` 不受影响）后要更新并显示新的图书信息，允许连续删除多本书。

```
xiaobai@localhost:~/bin

Delete books

ID: 10
Title:
Author:
Tags:
in/out:
Borrower:
outTime:
```

```
xiaobai@localhost:~/bin

Delete books

ID: 00010
Title: centos linux
Author: mary
Tags: #linux #centos
in/out: in
Borrower:
outTime:

Are you sure to delet the book? [y(es)/n(o)/c(ancel)]: y
```

```
xiaobai@localhost:~/bin

Delete books

ID:
Title:
Author:
Tags:
in/out:
Borrower:
outTime:

Success, any more books to delete? [y/n]: n
```

(请在下面贴出源代码)

Main.sh

1. #####
2. # File Name: main.sh
3. # Author: noya
4. # Mail: 1066771757@qq.com
5. # Created Time: Sun 20 Nov 2022 04:32:40 PM CST

```
6. #####
   ####
7. #!/bin/bash
8. #Personal library management System
9.
10. source enter.sh
11. source mainMenu.sh
12. source showBooks.sh
13. source findBooks.sh
14. source addBooks.sh
15. source editorBooks.sh
16. source checkOut.sh
17. source checkIn.sh
18. source deleteBooks.sh
19.
20. app_name='{0##*[\ \ /]}'
21. app_version="1.1"
22. bookdb=${1:-"books.db"}
23. User="noya@jxnu.edu.cn"
24.
25. sysName="Personal Library Managerment System"
26. sysVersion="Version:$app_version"
27. sysAuthor="${User}"
28. sysDate=$(date +%F)
29.
30. Red=1
31. Green=2
32. Brown=3
33. Blue=4
34. Purple=5
35. Cyan=6
36. White=7
37. colors=($Red $Green $Grown $blue $Purple $Cyan $White)
38.
39. Width=$(tput cols)
40. Height=$(tput lines)
41.
42. bold=$(tput bold)
43. rev=$(tput rev)
44. normal=$(tput sgr0)
45.
46. center(){
47.     tput cup $1 $(((Width-${#2})/2))
48. }
```

```

49. centerMessage(){
50.     tput cup $1 $(((Width-$2)/2))
51. }
52. bold(){
53.     echo -n ${bold}"$1"${normal}
54. }
55.
56. color(){
57.     echo -ne "\e[3${1}m${2}\e[0m"
58. }
59.
60. boldColor(){
61.     echo -ne "${bold}\e[3${1}m${2}\e[0m"
62. }
63.
64. error(){
65.     errTip='Invalid Input! Press any key to retry...'
66.     center 26 "$errTip"; color $Red "$errTip"
67.     read -n1 -s key
68. }
69.
70. showFlash
71. showMain

```

mainMenu.sh

```

1. #####
   ####
2. # File Name: mainMenu.sh
3. # Author: noya
4. # Mail: 1066771757@qq.com
5. # Created Time: Sun 20 Nov 2022 04:37:15 PM CST
6. #####
   ####
7. #!/bin/bash
8.
9. showMain(){
10.     error=0
11.     while :; do
12.         if [[ $error -eq 0 ]];then
13.             tput clear
14.             center 4 "Main Menu"; boldColor $Brown "Main Menu";
15.             centerMessage 7 30; bold "1: Show books"
16.             centerMessage 9 30; bold "2: Find books"
17.             centerMessage 11 30; bold "3: Add books"

```

```

18.          centerMessage 13 30; bold "4: Edit information of books"
19.          centerMessage 15 30; bold "5: Check out books"
20.          centerMessage 17 30; bold "6: Check in books"
21.          centerMessage 19 30; bold "7: Delete books"
22.          centerMessage 21 30; bold "q: Exit"
23.          message='Please inter your choice(1-7 or q):'
24.          inputCol=$((Width-#{#message})/2+#{#message}))
25.          center 24 "$message"; color $Cyan "$message"
26.      fi
27.      read choice
28.      case $choice in
29.          1)      showBooks; error=0;;
30.          2)      findBooks; error=0;;
31.          3)      addBooks; error=0;;
32.          4)      editBooks; error=0;;
33.          5)      checkOut; error=0;;
34.          6)      checkIn; error=0;;
35.          7)      deleteBooks;error=0;;
36. #          8)      center 24 "$choice"; color $Cyan "$message";;
37.          [qQ]*) tput clear;exit 0;;
38.          *)      error $((infoHeight+2))
39.                  tput cup $((infoHeight)) $inputCol
40.                  tput ed; error=0;;
41.      esac
42.      done
43. }

```

ShoeBooks.sh

```

1. #####
   ####
2. # File Name: showBooks.sh
3. # Author: noya
4. # Mail: 106771757@qq.com
5. # Created Time: Sun 20 Nov 2022 04:37:36 PM CST
6. #####
   ####
7. #!/bin/bash
8.
9. showBooks(){
10.     error=0
11.     while ;; do
12.         if [ $error -eq 0 ];then
13.             tput clear

```

```

14.         center 6 "Show books"; boldColor $Brown "Show books"
15.         centerMessage 8 30; bold "1:Sort by ID"
16.         centerMessage 10 30; bold "2:Sort by Title"
17.         centerMessage 12 30; bold "3:Sort by Author"
18.         centerMessage 14 30; bold "4:Show in"
19.         centerMessage 16 30; bold "5:Show out"
20.         centerMessage 18 30; bold "q:Main Menu"
21.         message='enter your choice(1-3 or q):'
22.         inputCol=$((Width-${#message})/2+${#message}))
23.         center 24 "$message";color $Cyan "$message"
24.     fi
25.     read choice
26.     case $choice in
27.         1)      showBook 1;;
28.         2)      showBook 2;;
29.         3)      showBook 3;;
30.         4)      showBook 4;;
31.         5)      showBook 5;;
32.         [qQ]*)  tput clear;return 0;;
33.         *)      error $((infoHeight+2))
34.                 tput cup $((infoHeight)) $inputCol
35.                 tput ed;error=0;;
36.     esac
37. done
38. }
39. showBook(){
40.     if [ ! -f $bookdb ];then
41.         echo "The book database is empty."
42.         return 1
43.     fi
44.     result=y
45.     until [ "$result" = n ];do
46.         tput clear
47.         case $1 in
48.             1)  sortedById;;
49.             2)  sortedByTitle;;
50.             3)  sortedByAuthor;;
51.             4)  showIn;;
52.             5)  showOut;;
53.         esac
54.         backmessage="BACK"
55.         echo
56.         color $Blue $backmessage
57.         read result

```



```

58.         case $result in
59.             *) tput clear;return 0;;
60.         esac
61.     done
62.
63. }
64.
65. sortedById(){
66.
67.     sort -t"%" -k1 $bookdb| awk 'BEGIN{FS = "%"}
68.     {printf "%15s%\n%15s%\n%15s%\n%15s%\n%15s%\n\n","ID: ",$1,"
        Title: ",$2,"Author: ",$3,"Tags: ",$4,"Status: ",$5}'
69.
70. }
71. sortedByTitle(){
72.     sort -t"%" -k2 $bookdb| awk 'BEGIN{FS = "%"}
73.     {printf "%15s%\n%15s%\n%15s%\n%15s%\n%15s%\n\n","ID:
        ",$1,"Title: ",$2,"Author: ",$3,"Tags: ",$4,"Status: ",$5}'
74.
75. }
76. sortedByAuthor(){
77.     sort -t"%" -k3 $bookdb| awk 'BEGIN{FS = "%"}
78.     {printf "%15s%\n%15s%\n%15s%\n%15s%\n%15s%\n\n","ID
        : ",$1,"Title: ",$2,"Author: ",$3,"Tags: ",$4,"Status: ",$5}'
79.     }
80.
81.
82. showIn(){
83.     awk 'BEGIN{FS = "%"}
84.     $5~/in/{printf "%15s%\n%15s%\n%15s%\n%15s%\n%15s%\n\n","ID:
        ",$1,"Title: ",$2,"Author: ",$3,"Tags: ",$4,"Status: ",$5}' $bookdb
85.
86. }
87. showOut(){
88.     awk 'BEGIN{FS = "%"}
89.     $5~/out/{printf "%15s%\n%15s%\n%15s%\n%15s%\n%15s%\n\n","ID:
        ",$1,"Title: ",$2,"Author: ",$3,"Tags: ",$4,"Status: ",$5}' $bookdb
90. }

```

findBooks.sh

```

1. #####
   ####
2. # File Name: findBooks.sh

```

```
3. # Author: breezea
4. # Mail: 1197402377@qq.com
5. # Created Time: Sun 20 Nov 2022 04:37:51 PM CST
6. #####
   ####
7. #!/bin/bash
8.
9. findBooks(){
10.     if [ ! -f $bookdb ];then
11.         echo "The book database is empty."
12.         return 1
13.     fi
14.     error=0
15.     while ;; do
16.         if [[ $error -eq 0 ]];then
17.
18.
19.             tput clear
20.             center 4 "Find books"; boldColor $Brown "Find books"
21.
22.             tput cup 7 $((Width/2-10)); boldColor $Blue "ID:"
23.
24.             tput cup 9 $((Width/2-
25.                 10)); boldColor $Blue "Title:"
26.
27.             tput cup 11 $((Width/2-
28.                 10)); boldColor $Blue "Author:"
29.
30.             tput cup 13 $((Width/2-
31.                 10)); boldColor $Blue "Tags:"
32.
33.             tput cup 15 $((Width/2-
34.                 10)); boldColor $Blue "in/out:"
35.
36.             tput cup 17 $((Width/2-
37.                 10)); boldColor $Blue "Borrower:"
38.
39.             tput cup 7 $((Width/2)); read id
40.
41.             tput cup 9 $((Width/2)); read title
42.
43.             tput cup 11 $((Width/2)); read author
44.
45.             tput cup 13 $((Width/2)); read tags
46.
47.             tput cup 15 $((Width/2)); read status
48.
49.             tput cup 17 $((Width/2)); read bname
50.
51.             message='Are you sure? [y(es)/n(o)/c(ancel)]:'
52.
53.             inputCol=$((Width-#{#message}))/2+#{#message})
```

```

40.             center 24 "$message";color $Cyan "$message"
41.         fi
42.         read choice
43.         case $choice in
44.             y) printbooks;;
45.             Y) printbooks;;
46.             n) tput clear;;
47.             c) tput clear;return 0;;
48.             *) error $((infoHeight+2))
49.                 tput cp $((infoHeight)) $inputCol
50.
51.
52.                 tput ed;error=0;;
53.         esac
54.     done
55. }
56. printbooks(){
57.     tput clear
58.     awk -v tags=$tags -v id=$id -v title=$title -
        v author=$author -v status=$status -
        v bname=$bname 'BEGIN{i=9;FS = "%"}
59.         $1~id&&$2~title&&$3~author&&$4~tags&&$5~status&&$6~bn
ame{printf "%15s%s\n%15s%s\n%15s%s\n%15s%s\n%15s%s\n\n", "ID: ", $1, "Ti
tle: ", $2, "Author: ", $3, "Tags: ", $4, "Status: ", $5}' $bookdb
60.
61.         backmessage="BACK"
62.         echo
63.         color $Cyan "$backmessage"
64.         read result
65.         case $result in
66.             *)      tput clear;return 0;;
67.
68.         esac
69. }

```

addBooks.sh

```

1. #####
   ####
2. # File Name: addBooks.sh
3. # Author: breezea
4. # Mail: 1197402377@qq.com
5. # Created Time: Sun 20 Nov 2022 04:38:07 PM CST
6. #####
   ####

```

```

7. #!/bin/bash
8.
9. addBooks(){
10.     tput clear
11.     any="y"
12.     while [ "$any" = "y" ];do
13.         center 4 "Add books";boldColor $Brown "Add books"
14.         tput cup 7 $((Width/2-10)); boldColor $Blue "      ID: "
15.         tput cup 9 $((Width/2-10)); boldColor $Blue "    Title: "
16.         tput cup 11 $((Width/2-10)); boldColor $Blue "  author: "
17.         tput cup 13 $((Width/2-10)); boldColor $Blue "    Tags: "
18.         tput cup 7 $((Width/2)); autoId
19.         tput cup 9 $((Width/2)); read Title
20.         tput cup 11 $((Width/2)); read Author
21.         tput cup 13 $((Width/2)); read Tags
22.         suremessage="Are you sure? [y/n/c(ancel)]: "
23.         center 20 "$suremessage";color $Cyan "$suremessage"
24.         read sure
25.         BookId=$(autoId)
26.         case $sure in
27.             [yY])  echo "$BookId$title$Author#$Tags\n%" >>$book
db;;
28.             [nN])  continue;;
29.             [cC]|*) tput clear;return 0;;
30.         esac
31.         anymessage="Success, any book to add?[y/n]:"
32.         center 22 "$anymessage";color $Cyan "$anymessage"
33.         read any
34.     done
35. }
36. autoId(){
37. #   new=`awk 'BEGIN{FS="%"}{last=$1}END{print last}' $bookdb | awk 'B
EGIN{FS="-"}{print $2+1}' `
38.     new=`awk 'BEGIN{FS="%"}{last=$1}END{print last+1}' $bookdb `
39.     if [ ${#new} -eq 1 ];then
40.         new="0000$new"
41.     elif [ ${#new} -eq 2 ];then
42.         new="000$new"
43.     elif [ ${#new} -eq 3 ];then
44.         new="00$new"
45.     elif [ ${#new} -eq 4 ];then
46.         new="0$new"
47.     else
48.         new="$new"

```

```
49.     fi
50.     echo "$new"
51. }
```

editorBooks.sh

```
1. #####
   ####
2. # File Name: editorBooks.sh
3. # Author: breezea
4. # Mail: 1197402377@qq.com
5. # Created Time: Sun 20 Nov 2022 04:38:22 PM CST
6. #####
   ####
7. #!/bin/bash
8.
9.
10. editBooks(){
11.     tput clear
12.     any="y"
13.     while [ "$any" = "y" ];do
14.         tput clear
15.         center 4 "Edit information of books";boldColor $Brown "Edit i
            nformation of books"
16.         tput cup 7 $((Width/2-15)) ;boldColor $Blue "BookId:"
17.         tput cup 9 $((Width/2-15));boldColor $Blue " Title:"
18.         tput cup 11 $((Width/2-15));boldColor $Blue "Author:"
19.         tput cup 13 $((Width/2-15));boldColor $Blue " Tags:"
20.         tput cup 15 $((Width/2-15));boldColor $Blue "in/out:"
21.         tput cup 17 $((Width/2-15));boldColor $Blue "Borrower:"
22.         tput cup 19 $((Width/2-15));boldColor $Blue "outTime:"
23.         tput cup 7 $((Width/2-5));read BookId
24.
25.         if [ ${#BookId} -eq 1 ]; then
26.             BookId="0000$BookId"
27.         elif [ ${#BookId} -eq 2 ]; then
28.             BookId="000$BookId"
29.         elif [ ${#BookId} -eq 3 ]; then
30.             BookId="00$BookId"
31.         elif [ ${#BookId} -eq 4 ]; then
32.             BookId="0$BookId"
33.         else
34.             BookId=$BookId
35.         fi
36.         # 检查 bookId 是否有效
```

```

37.         found_num=`awk -
v id=$BookId 'begin{FS="%";count=0}$1~id{count=count+1}END{print coun
t}' books.db`
38.         if [[ -z "$found_num" || $found_num -ne 1 ]];then
39.             errTip="valied BookId! Press any key to retry..."
40.             center 26 "$errTip"; color $Red "$errTip"
41.             read -n1 -s key
42.             continue
43.         fi
44.
45.         tput cup 7 $((Width/2-5))
46.         awk -
v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $1}' $bookdb
47.         tput cup 9 $((Width/2-5))
48.         awk -
v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $2}' $bookdb
49.         oldTitle=`awk -
v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $2}' $bookdb`
50.         tput cup 11 $((Width/2-5))
51.         awk -
v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $3}' $bookdb
52.         oldAuthor=`awk -
v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $3}' $bookdb`
53.         tput cup 13 $((Width/2-5))
54.         awk -
v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $4}' $bookdb
55.         oldTags=`awk -
v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $4}' $bookdb`
56.         tput cup 15 $((Width/2-5))
57.         awk -
v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $5}' $bookdb
58.         oldState=`awk -
v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $5}' $bookdb`
59.         tput cup 17 $((Width/2-5))
60.         awk -
v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $6}' $bookdb
61.         oldBname=`awk -
v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $6}' $bookdb`
62.         tput cup 19 $((Width/2-5))
63.         awk -
v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $7}' $bookdb
64.         oldTime=`awk -
v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $7}' $bookdb`
65.

```

```

66.
67.
68.      tput cup 9 $((Width/2+15)); boldColor $Blue "==>"
69.      tput cup 11 $((Width/2+15)); boldColor $Blue "==>"
70.      tput cup 13 $((Width/2+15)); boldColor $Blue "==>"
71.      tput cup 15 $((Width/2+15)); boldColor $Blue "==>"
72.      tput cup 17 $((Width/2+15)); boldColor $Blue "==>"
73.      tput cup 19 $((Width/2+15)); boldColor $Blue "==>"
74.      tput cup 9 $((Width/2+20));read Title
75.      tput cup 11 $((Width/2+20));read Author
76.      tput cup 13 $((Width/2+20));read Tags
77.      tput cup 15 $((Width/2+20));read State
78.      tput cup 17 $((Width/2+20));read bname
79.      tput cup 19 $((Width/2+20));read Time
80.      newTitle=${Title:-$oldTitle}
81.      newAuthor=${Author:-$oldAuthor}
82.      newTags=${Tags:-$oldTags}
83.      newState=${State:-$oldState}
84.      newName=${bname:-$oldBname}
85.      newTime=${Time:-$oldTime}
86.      if [ -z "$oldBname" ];then
87.          oldBname="shabi"
88.      fi
89.      if [ -z "$oldTime" ];then
90.          oldTime="shabi"
91.      fi
92.      suremessage="Are you sure? [y/n/c(ancel)]: "
93.      center 24 "$suremessage";color $Cyan "$suremessage"
94.      read sure
95.      case $sure in
96.          [yY])  sed -
                  i "/^$BookId/{s@$oldTitle@$newTitle@;s@$oldAuthor@$newAuthor@;s@$oldT
                  ags@$newTags@;s@$oldState@$newState@;s@$oldBname@$newBname@;s@$oldTim
                  e@$newTime@}" $bookdb;;
97.          [nN])  continue;;
98.          [cC]|*) tput clear;return 0;;
99.      esac
100.      anymessage="Edit anymore book?[y(es)/n(o)]:"
101.      center 26 "$anymessage";color $Cyan "$anymessage"
102.      read any
103.      done
104.  }

```

checkIn.sh

```

1. #####
   ####
2. # File Name: checkIn.sh
3. # Author: noya
4. # Mail: 1066771757@qq.com
5. # Created Time: Sun 20 Nov 2022 04:38:52 PM CST
6. #####
   ####
7. #!/bin/bash
8.
9. checkIn(){
10.     tput clear
11.     any="y"
12.     while [ "$any" = "y" ];do
13.         center 4 "Check in books";boldColor $Brown "Check in books"
14.         centerMessage 7 50;boldColor $Blue "      ID:"
15.         centerMessage 9 50;boldColor $Blue "    Title:"
16.         centerMessage 11 50;boldColor $Blue "  Author:"
17.         centerMessage 13 50;boldColor $Blue "    Tags:"
18.         centerMessage 15 50;boldColor $Blue "  in/out:"
19.         centerMessage 17 50;boldColor $Blue "Borrower:"
20.         centerMessage 19 50;boldColor $Blue " outTime:"
21.         tput cup 7 $((Width/2-15)); read BookId
22.         # 生成 bookId
23.         if [ ${#BookId} -eq 1 ]; then
24.             BookId="0000$BookId"
25.         elif [ ${#BookId} -eq 2 ]; then
26.             BookId="000$BookId"
27.         elif [ ${#BookId} -eq 3 ]; then
28.             BookId="00$BookId"
29.         elif [ ${#BookId} -eq 4 ]; then
30.             BookId="0$BookId"
31.         else
32.             BookId=$BookId
33.         fi
34.         # 检查 bookId 是否有效
35.         found_num=`awk -
            v id=$BookId 'begin{FS="%";count=0}$1~id{count=count+1}END{print coun
            t}' books.db`
36.         if [[ -z "$found_num" || $found_num -ne 1 ]];then
37.             errTip="valied BookId! Press any key to retry..."
38.             center 26 "$errTip"; color $Red "$errTip"
39.             read -n1 -s key
40.             continue

```



```

41.         fi
42.         tput cup 7 $((Width/2-15))
43.         awk -
            v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $1}' $bookdb
44.         tput cup 9 $((Width/2-15))
45.         awk -
            v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $2}' $bookdb
46.         tput cup 11 $((Width/2-15))
47.         awk -
            v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $3}' $bookdb
48.         tput cup 13 $((Width/2-15))
49.         awk -
            v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $4}' $bookdb
50.         tput cup 15 $((Width/2-15))
51.         awk -
            v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $5}' $bookdb
52.         tput cup 17 $((Width/2-15))
53.         awk -
            v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $6}' $bookdb
54.         tput cup 19 $((Width/2-15))
55.         awk -
            v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $7}' $bookdb
56.
57.         suremessage="Are you sure?[y/n/c]:"
58.         center 24 "$suremessage";color $Cyan "$suremessage"
59.         read sure
60.         case $sure in
61.             [yY])  sed -i "/^$BookId/s#%out%.*#%in%#" $bookdb;;
62.             [nN])  continue;;
63.             [cC]|*) tput clear;return 0;;
64.         esac
65.         anymessage="Borrow anymore book?[y/n]:"
66.         center 26 "$anymessage";color $Cyan "$anymessage"
67.         read any
68.         done
69. }

```

checkout.sh

```

1. #####
   ####
2. # File Name: checkOut.sh
3. # Author: noya
4. # Mail: 1066771757@qq.com

```

```

5. # Created Time: Sun 20 Nov 2022 04:38:41 PM CST
6. #####
   ####
7. #!/bin/bash
8.
9. checkOut(){
10.     tput clear
11.     any="y"
12.     while [ "$any" = "y" ];do
13.         center 4 "Check out books";boldColor $Brown "Check out books"
14.         centerMessage 7 50;boldColor $Blue "      ID:"
15.         centerMessage 9 50;boldColor $Blue "      Title:"
16.         centerMessage 11 50;boldColor $Blue "      Author:"
17.         centerMessage 13 50;boldColor $Blue "      Tags:"
18.         centerMessage 15 50;boldColor $Blue "      in/out:"
19.         centerMessage 17 50;boldColor $Blue "Borrower:"
20.         tput cup 7 $((Width/2-15)); read BookId
21.         # 生成 bookId
22.         if [ ${#BookId} -eq 1 ]; then
23.             BookId="0000$BookId"
24.         elif [ ${#BookId} -eq 2 ]; then
25.             BookId="000$BookId"
26.         elif [ ${#BookId} -eq 3 ]; then
27.             BookId="00$BookId"
28.         elif [ ${#BookId} -eq 4 ]; then
29.             BookId="0$BookId"
30.         else
31.             BookId=$BookId
32.         fi
33.         # 检查 bookId 是否有效
34.         found_num=`awk -
            v id=$BookId 'begin{FS="%";count=0}$1~id{count=count+1}END{print coun
            t}' books.db`
35.         if [[ -z "$found_num" || $found_num -ne 1 ]];then
36.             errTip="valied BookId! Press any key to retry..."
37.             center 24 "$errTip"; color $Red "$errTip"
38.             read -n1 -s key
39.             continue
40.         fi
41.         tput cup 7 $((Width/2-15))
42.         awk -
            v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $1}' $bookdb
43.         tput cup 9 $((Width/2-15))

```

```

44.      awk -
      v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $2}' $bookdb
45.      tput cup 11 $((Width/2-15))
46.      awk -
      v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $3}' $bookdb
47.      tput cup 13 $((Width/2-15))
48.      awk -
      v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $4}' $bookdb
49.      tput cup 15 $((Width/2-15))
50.      awk -
      v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $5}' $bookdb
51.      tput cup 17 $((Width/2-15)); read borrower
52.      suremessage="Are you sure?[y/n/c]:"
53.      center 22 "$suremessage";color $Cyan "$suremessage"
54.      read sure
55.      case $sure in
56.          [yY])  sed -
      i "/^$BookId/s#%in%%#out%$borrower%$sysDate#" $bookdb;;
57.          [nN])  continue;;
58.          [cC]|*) tput clear;return 0;;
59.      esac
60.      anymessage="Borrow anymore book?[y/n]:"
61.      center 24 "$anymessage";color $Cyan "$anymessage"
62.      read any
63.      done
64. }

```

DeleteBooks.sh

```

1. #####
   ####
2. # File Name: deleteBooks.sh
3. # Author: noya
4. # Mail: 1066771757@qq.com
5. # Created Time: Sun 20 Nov 2022 04:39:14 PM CST
6. #####
   ####
7. #!/bin/bash
8.
9. deleteBooks(){
10.     tput clear
11.     any="y"
12.     while [ "$any" = "y" ];do
13.         tput clear

```

```

14.         center 4 "Delete books";boldColor $Brown "Delete books"
15.         centerMessage 7 $((Width/2-10));boldColor $Blue "      ID:"
16.         centerMessage 9 $((Width/2-10));boldColor $Blue "      Title:"
17.         centerMessage 11 $((Width/2-
18.             10));boldColor $Blue "      Author:"
19.         centerMessage 13 $((Width/2-
20.             10));boldColor $Blue "      Tags:"
21.         centerMessage 15 $((Width/2-
22.             10));boldColor $Blue "      in/out:"
23.         centerMessage 17 $((Width/2-
24.             10));boldColor $Blue "Borrower:"
25.         centerMessage 19 $((Width/2-
26.             10));boldColor $Blue "      outTime:"
27.         tput cup 7 $((Width/2-5)); read BookId
28.         # 生成 bookId
29.         if [ ${#BookId} -eq 1 ]; then
30.             BookId="0000$BookId"
31.         elif [ ${#BookId} -eq 2 ]; then
32.             BookId="000$BookId"
33.         elif [ ${#BookId} -eq 3 ]; then
34.             BookId="00$BookId"
35.         elif [ ${#BookId} -eq 4 ]; then
36.             BookId="0$BookId"
37.         else
38.             BookId=$BookId
39.         fi
40.         # 检查 bookId 是否有效
41.         found_num=`awk -
42.             v id=$BookId 'begin{FS=" "};count=0}$1~id{count=count+1}END{print coun
43.             t}' books.db`
44.         if [[ -z "$found_num" || $found_num -ne 1 ]];then
45.             errTip="valied BookId! Press any key to retry..."
46.             center 32 "$errTip"; color $Red "$errTip"
47.             read -n1 -s key
48.             continue
49.         fi
50.         tput cup 7 $((Width/2-5))
51.         awk -
52.             v BookId=$BookId 'BEGIN{FS=" "}$1~BookId{print $1}' $bookdb
53.         tput cup 9 $((Width/2-5))
54.         awk -
55.             v BookId=$BookId 'BEGIN{FS=" "}$1~BookId{print $2}' $bookdb
56.         tput cup 11 $((Width/2-5))

```

```

48.      awk -
      v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $3}' $bookdb
49.      tput cup 13 $((Width/2-5))
50.      awk -
      v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $4}' $bookdb
51.      tput cup 15 $((Width/2-5))
52.      awk -
      v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $5}' $bookdb
53.      tput cup 17 $((Width/2-5))
54.      awk -
      v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $6}' $bookdb
55.      tput cup 19 $((Width/2-5))
56.      awk -
      v BookId=$BookId 'BEGIN{FS="%"}$1~BookId{print $7}' $bookdb
57.
58.      suremessage="Are you sure?[y/n/c]:"
59.      center 32 "$suremessage";color $Cyan "$suremessage"
60.      read sure
61.      case $sure in
62.          [yY])  sed -i "/^$BookId/d" $bookdb;;
63.          [nN])  continue;;
64.          [cC]|*) tput clear;return 0;;
65.      esac
66.      anymessage="Success,any more book to delete?[y/n]:"
67.      center 35 "$anymessage";color $Cyan "$anymessage"
68.      read any
69.      done
70. }

```

(请在下面贴出执行情况截图)

数据库内容:

```

s13@s13-virtual-machine:~/bin$ cat books.db
00001%computer network%le%#network%in%%
00002%operation system%mike%#os%in%%
00003%database system%jane%#db%in%%
00004%the c pargrammg language%ritchie%#p1 #c%in%%
00005%computer vision%tony%#cv%in%%
00006%learng python%susie%#p1 #python%in%%
00007%html5 and css%jane%#web%in%%
00008%lux bible%jack%#os #linux%in%%
00009%network security>wang%#network #security%out%zh%2022-11-22
s13@s13-virtual-machine:~/bin$

```

首页:

```
s13@s13-virtual-machine: ~/bin

Personal Library Managerment System

Version:1.1

noya@jxnu.edu.cn

2022-11-22

Press ENTER to continue...
```

```
s13@s13-virtual-machine: ~/bin

Main Menu

1: Show books
2: Find books
3: Add books
4: Edit information of books
5: Check out books
6: Check in books
7: Delete books
q: Exit

Please inter your choice(1-7 or q):
```

1、显示图书信息：

```
s13@s13-virtual-machine: ~/bin

Show books

1:Sort by ID
2:Sort by Title
3:Sort by Author
4:Show in
5:Show out
q:Main Menu

enter your choice(1-3 or q):
```

根据 id 排序:

```
ID: 00001
Title: computer network
Author: le
Tags: #network
Status: in

ID: 00002
Title: operation system
Author: mike
Tags: #os
Status: in

ID: 00003
Title: database system
Author: jane
Tags: #db
Status: in

ID: 00004
Title: the c pargrammg language
Author: ritchie
Tags: #p1 #c
Status: in

ID: 00005
Title: computer vision
Author: tony
Tags: #cv
```

```
Status: in

ID: 00006
Title: learnng python
Author: susie
Tags: #p1 #python
Status: in

ID: 00007
Title: html5 and css
Author: jane
Tags: #web
Status: in

ID: 00008
Title: lux bible
Author: jack
Tags: #os #linux
Status: in

ID: 00009
Title: network security
Author: wang
Tags: #network #security
Status: out
```

[BACK](#)

根据 Title 排序:

```
ID: 00001
Title: computer network
Author: le
Tags: #network
Status: in

ID: 00005
Title: computer vision
Author: tony
Tags: #cv
Status: in

ID: 00003
Title: database system
Author: jane
Tags: #db
Status: in

ID: 00007
Title: html5 and css
Author: jane
Tags: #web
Status: in

ID: 00006
Title: learnng python
Author: susie
Tags: #p1 #python
```



```
Status: in

    ID: 00008
    Title: lux bible
    Author: jack
    Tags: #os #linux
    Status: in

    ID: 00009
    Title: network security
    Author: wang
    Tags: #network #security
    Status: out

    ID: 00002
    Title: operation system
    Author: mike
    Tags: #os
    Status: in

    ID: 00004
    Title: the c pargrammg language
    Author: ritchie
    Tags: #p1 #c
    Status: in

BACK
```

根据 Author 排序:

```
    ID: 00008
    Title: lux bible
    Author: jack
    Tags: #os #linux
    Status: in

    ID: 00003
    Title: database system
    Author: jane
    Tags: #db
    Status: in

    ID: 00007
    Title: html5 and css
    Author: jane
    Tags: #web
    Status: in

    ID: 00001
    Title: computer network
    Author: le
    Tags: #network
    Status: in

    ID: 00002
    Title: operation system
    Author: mike
    Tags: #os
```

```
Status: in

    ID: 00004
    Title: the c pargrammg language
    Author: ritchie
    Tags: #p1 #c
    Status: in

    ID: 00006
    Title: learnng python
    Author: susie
    Tags: #p1 #python
    Status: in

    ID: 00005
    Title: computer vision
    Author: tony
    Tags: #cv
    Status: in

    ID: 00009
    Title: network security
    Author: wang
    Tags: #network #security
    Status: out

BACK
```

查看所有未借出的:

```
    ID: 00001
    Title: computer network
    Author: le
    Tags: #network
    Status: in

    ID: 00002
    Title: operation system
    Author: mike
    Tags: #os
    Status: in

    ID: 00003
    Title: database system
    Author: jane
    Tags: #db
    Status: in

    ID: 00004
    Title: the c pargrammg language
    Author: ritchie
    Tags: #p1 #c
    Status: in

    ID: 00005
    Title: computer vision
    Author: tony
    Tags: #cv
```

查看所有借出的:

```

      ID: 00009
      Title: network security
      Author: wang
      Tags: #network #security
      Status: out

```

```
BACK
```

2、查找书籍功能

Find books

```

ID:
Title:
Author:
Tags:    #linux
in/out:
Borrower:

```

```
Are you sure? [y(es)/n(o)/c(ancel)]:y
```

```
ID: 00008
Title: lux bible
Author: jack
Tags: #os #linux
Status: in
```

BACK

Find books

```
ID:
Title:  html5
Author:  jane
Tags:
in/out:
Borrower:
```

Are you sure? [y(es)/n(o)/c(ancel)]:y

```
ID: 00007
Title: html5 and css
Author: jane
Tags: #web
Status: in
```

BACK

3、添加书籍功能

自动生成 id:

Add books

ID: 00010

Title:

author:

Tags:

```

Add books

ID: 00010
Title: centos linux
author: mary
Tags: #linux #centos

Are you sure? [y/n/c(ancel)]: y
Success, any book to add?[y/n]:
```

```

Status: in

ID: 00007
Title: html5 and css
Author: jane
Tags: #web
Status: in

ID: 00008
Title: lux bible
Author: jack
Tags: #os #linux
Status: in

ID: 00009
Title: network security
Author: wang
Tags: #network #security
Status: out

ID: 00010
Title: centos linux
Author: mary
Tags: ##linux #centos
Status: in

BACK
```

4、修改功能

自动补全 id

Edit information of books

BookId: 9

Title:

Author:

Tags:

in/out:

Borrower:

outTime:

Edit information of books

BookId: 00009

Title: network security ==> █

Author: wang ==>

Tags: #network #security ==>

in/out: out ==>

Borrower: zh ==>

outTime: 2022-11-22 ==>

```

    Edit information of books

BookId: 00009
Title: network security ==>
Author: wang ==> le
Tags: #network #security ==>
in/out: out ==>
Borrower: zh ==>
outTime: 2022-11-22 ==>

Are you sure? [y/n/c(ancel)]: y
Edit anymore book?[y(es)/n(o)]:n

```

```

    Edit information of books

BookId: 00009
Title: network security ==>
Author: le ==>
Tags: #network #security ==>
in/out: out ==>
Borrower: zh ==>
outTime: 2022-11-22 ==>

```

5、借书功能

自动补全 id 并回写数据

Check out books

ID: 2

Title:

Author:

Tags:

in/out:

Borrower:

Check out books

ID: 00002

Title: operation system

Author: mike

Tags: #os

in/out: in

Borrower:

输入借书人:

```

                                Check out books

ID: 00002
Title: operation system
Author: mike
Tags: #os
In/out: in
Borrower: noya

Are you sure?[y/n/c]:y
Borrow anymore book?[y/n]:n
```

查看借出的书:

```

ID: 00002
Title: operation system
Author: mike
Tags: #os
Status: out

ID: 00009
Title: network security
Author: le
Tags: #network #security
Status: out

BACK
```

6、还书功能

自动补全 id 并且回写数据:

Check in books

ID: 2

Title:

Author:

Tags:

in/out:

Borrower:

outTime:

Check in books

ID: 00002

Title: operation system

Author: mike

Tags: #os

in/out: out

Borrower: noya

outTime: 2022-11-22

Are you sure?[y/n/c]:

```

                                Check in books

ID: 00002

Title: operation system

Author: mike

Tags: #os

in/out: out

Borrower: noya

outTime: 2022-11-22

Are you sure?[y/n/c]:y

Borrow anymore book?[y/n]:n^[^A

```

查看借出的书发现没有了 2 说明成功还书:

```

ID: 00009
Title: network security
Author: le
Tags: #network #security
Status: out

BACK

```

7、删除书籍

自动补全 id 并回写数据:

```

                                Delete books

ID:      8
Title:
Author:
Tags:
in/out:
Borrower:
outTime:

```

```

                                Delete books

ID:      00008
Title:    lux bible
Author:   jack
Tags:     #os #linux
in/out:   in
Borrower:
outTime:

Are you sure?[y/n/c]:

```

查看书籍发现 8 没有成功删除：

Status: in

ID: 00006
Title: learnng python
Author: susie
Tags: #p1 #python
Status: in

ID: 00007
Title: html5 and css
Author: jane
Tags: #web
Status: in

ID: 00009
Title: network security
Author: le
Tags: #network #security
Status: out

ID: 00010
Title: centos linux
Author: mary
Tags: ##linux #centos
Status: in

[BACK](#)