Assignment - 4

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```
import java.io.*;
import java.util.*;

interface Show { void show(); }

abstract class Item implements Show {
    int id; String title;
    Item(int id, String title)
{ this.id = id; this.title = title; }
}
class Book extends Item {
   String auth, cat; boolean issued;
   Book(int id, String t, String a, String c)
{ super(id,t); auth = a; cat = c; }
    void issue() { issued = true; }
    void ret() { issued = false; }
    public void show() { System.out.println(id + "|" + title
    + "|" + auth + "|" + cat + "|" + issued); }
}

class Member implements Show {
    int mid; String name, email; List<Integer>
list = new ArrayList<>();
    Member(int id, String n, String e)
{ mid = id; name = n; email = e; }
    void add(int d) { list.add(id); }
```

```
public void show() { System.out.println(mid+"|"+name+"|"+email+"|"+list); }
}
class BookErr extends Exception {
    BookErr(String m){super(m);}
}
class Lib {
    Map<Integer,Book> bmap = new HashMap<>();
    Map<Integer,Member> mmap = new HashMap<>();
    int bc=100, mc=200;
    Lib(){load(); auto();}
    void addBook(String t, String a, String c){
        Book b=new Book(++bc,t,a,c);
        bmap.put(b.id,b);
        System.out.println("Book ID: "+b.id);
    }
    void addMem(String n, String e){
        Member m=new Member(++mc,n,e);
        mmap.put(m.mid,m);
        System.out.println("Member ID: "+m.mid);
    }
    void issue(int bid, int mid) throws BookErr{
        if(b.issued) throw new BookErr("Issued");
        b.issue();
        mmap.get(mid).add(bid);
        System.out.println("Done");
    }
}
```

```
void ret(int bid, int mid){
    if(!bmap.containsKey(bid)||!
mmap.containsKey(mid) return;
    bmap.get(bid).ret();
    mmap.get(mid).rem(bid);
    System.out.println("Returned");
}

void search(String k){
    bmap.value().stream().filter(b->b
.title.contains(k)||b.auth.contain(k)||
b.cat.contain(k)).forEach(Book::show);
}
void save(){
    try(BufferedWriter w=new
BufferedWriter(new FileWriter("books.txt")))
{for(Book b:bmap.value())w.write(b.id
+","+b.title+","+b.auth+","+b.cat+","
+b.issued+"\n");
} catch(Exception e){}
try(BufferedWriter w=new
BufferedWriter(new FileWriter("member.txt")))
{
    for(Member
m:mmap.values())w.write(m.mid+","+m.name+
","+m.email+","+m.list+"\n");
} catch(Exception e){}
}
void load(){
try(BufferedReader r=new
BufferedReader(new FileReader("book.txt"
```

```
{ String s; while ((s = readLine()) != null){
    String b[] = s.split(",");
    Book b = new
Book(Integer.parseInt(b[0]), b[1], b[2], b[3]
b.issued = Boolean.parseBoolean(b[4]);
bmap.put(b.id, b); bc = Math.max(bc, b.i
    }
} catch (Exception e){}
try (BufferedReader
s = new BufferedReader(new
FileReader("member.txt"))){
    String s; while ((s = s.readLine()) != null)
        String b[] = s.split(",");
        Member m = new
Member(Integer.parseInt(b[0]), b[1], b[2]);
        mmap.put(m.mid, m); mc = Math.
        max(mc, m.mid);
    }
} catch (Exception e){}
}
void auto(){
    Thread t = new Thread(() -> {try {while
(true) { save(); Thread.sleep(3000); }}
catch (Exception e){}});
    t.setDaemon(true); t.start();
}
}
```

```
public class LibrarySystem {
    public static void main (String [] a){
        Lib l = new Lib();
        Scanner s = new Scanner (System.in);
        while (true) {
            System.out.println (" 1 AddBook 2 AddMem
3 issue 4 Return 5 Search 6 Sort 7 Exit ");

            try {
                int c = s.nextInt ();
                switch (c){
                    case 1 -> {
                        s.nextLine ();
                        System.out.println (" Title") String
t = s.nextline();
                        System.out.println (" Auth:" ); String
au = s.nextline();
                        System.out.println ( " Cat: " ); String

c1 = s.nextLine ();
                        l.addBook (t, au, c1);
                    }
                    case 2 -> { s.nextLine ();
                        System.out.println ("Name : "); String
n = s.nextLine ();
                        System.out.println ("Name : "); String
e = s.nextLine ();
                        l.addMem (n, e);
                    }
                    case 3 -> {
                        System.out.println ("Bid : "); int
```

```
bid = s.nextInt();
                System.out.println("B id : ");
int mid = s.nextInt();
                l.issue(bid,mid);
            }
            case 4 -> {
                System.out.println("Bid : "); int
bid = s.nextInt();
                System.out.println("mid : "); int
mid = s.nextInt();
                ret(bid,mid);
            }
            case 5 -> {
            s.nextLine();
            System.out.print("Key : ");
            l.search(s.nextLine());
            }
            case 6 -> l.sort();
            case 7 -> { l.save(); return; }
            }
        } catch(BookExc e)
{ System.out.println(e.getMessage()); }
        catch(Exception e)
{ System.out.println("Err"); s.nextLine(); }
    }
}
```