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Python Project 1 – Library Management System

The Library Management System is designed to handle basic library functions. It provides a solution for libraries to organize books and for administrators to maintain user accounts, search, borrow, and return books. It has a database for both books and user accounts. Libraries can register new books and purge books from this database. Readers can use libraries to search for books by typing book ids and names. Likewise, administrators can register new account and purge old accounts. They can borrow books as well. After a book is borrowed, the book status will be updated. If an administrator wants to borrow a book but the library has out of storage, a warning message will display so that the he would know whether the library has any more available. Similarly, after the book is returned, he can access the book status and borrow if needed.

There are lots of challenges in this project. First is to find a suitable database function to read and write the accounts and books. I had to keep registering new books and new accounts until I found the pickle function. Second is to design the interaction between different classes, especially between library and admin. Library is the place to hold books. Admin is the person performing functions such as borrow, return, and register accounts. When I first designed this project, I used the same class for library and administrator, causing lots of confusion to the implementation and database. I had to adjust the project multiple times to finalize the code. The third thing I learn is to create private functions. We want to protect many data from being changed by authorized personnel. Private functions provide more protection to our database.

This project can be used for local libraries to maintain their books and user accounts. Going forward, I would like to add punish functions so that when a reader exceeds the maximum borrowing time, he may not be able to borrow more books. I would like to have a rewards function for readers who read more than 1 book per month. A reward logo will be displayed next to this user's account.

The following are specific testing instructions:

```
print("TEST library register book")  
lib.register_book(book_id = 'b001', book_name = 'Little fire everywhere', author = 'Celeste')  
lib.register_book(book_id = 'b002', book_name = 'Computer History', author = 'Bob')
```

```
print("TEST library search book")
```

```
print("TODO: search book by id")  
lib.search_book(book_id = 'b003')  
lib.search_book(book_id = 'b001')
```

```
print("TODO: search book by name")  
lib.search_book(book_name = 'Little fire everywhere')
```

```
print("TODO: search book by author")  
lib.search_book(author = 'Bob')  
print("")
```

```
print("TEST admin register account")  
admin.register_account(account_id = 'a001', account_name = 'grace')
```

```
admin.register_account(account_id = 'a002', account_name = 'joyce')  
print("")
```

```
print("TEST admin search account")
```

```
print("TODO: search account by id")  
admin.search_account(account_id = 'a001')  
admin.search_account(account_id = 'aaa')
```

```
print("TODO: search account by name")  
admin.search_account(account_name = 'joyce')  
print("")
```

```
print("TEST admin borrow book")  
print("TODO: Borrow book b001 for the first time")  
admin.borrow_book(book_id = 'b001', account_id = 'a001', datetime = '2018-07-08')
```

```
print("TODO: Check account a001 history")  
admin.search_account(account_id = 'a001')
```

```
print("TODO: Check book b001 status")  
lib.search_book(book_id = 'b001')
```

```
print("TODO: Borrow book b001 for the second time")  
admin.borrow_book(book_id = 'b001', account_id = 'a001', datetime = '2018-07-08')
```

```
print("TODO: Borrow book b002 for the first time")  
admin.borrow_book( book_id = 'b002', account_id = 'a001', datetime = '2018-07-08')
```

```
print("TODO: Check account a001 history")
admin.search_account(account_id = 'a001')
print("")
```

```
print("TEST admin return book")
admin.return_book(book_id = 'b001', account_id = 'a001', datetime = '2018-07-08')
```

```
print("TODO: Check book b001 status")
lib.search_book(book_id = 'b001')
```

```
print("TODO: Check account a001 history")
admin.search_account(account_id = 'a001')
```

```
print("TODO: Borrow book b001 again")
admin.borrow_book(book_id = 'b001', account_id = 'a002', datetime = '2018-07-08')
```

```
print("TODO: Check account a002 history")
admin.search_account(account_id = 'a002')
print("")
```