

# Assignment No. 1

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## Objectives

This assignment has been designed so that you understand the concept of classes in C++. After the completion of this assignment you should have a good grasp on:

- Writing classes in C++.
- Accessing the data members of the class, using member functions.
- Writing constructor and destructor.

## Source Code

### class Opt\_library.h

```
class Opt_library
{
private:
    int card_number;
    int valid_days_left;
    int books_issued;
    int books_returned;
    int Number_of_books;
public:
    Opt_library(int,int,int,int);
    ~Opt_library();

    int getCardNumber(){return card_number;}
    int getValidDaysLeft(){return valid_days_left;}
    int getBooksIssued(){return books_issued;}
    int getBooksReturned(){return books_returned;}
    int getNumberOfBooks(){return Number_of_books;}
    void setCardNumber(int id){card_number = id;}
    void setValidDaysLeft(int days){valid_days_left = days;}
    void setBooksIssued(int issued){books_issued = issued;}
    void setBooksReturned(int returned){books_returned = returned;}
    void setNumberOfBooks(int books){Number_of_books = books;}

    int PreviousStatusOfTheCard();
    int issue_books(int);
    void display();
};
```

### Opt\_library function.cpp

```
#include"class Opt_library.h"
#include<iostream>
using namespace std;

Opt_library::Opt_library(int id,int days,int issued,int returned)
{
    card_number = id;
```

```

        valid_days_left = days;
        books_issued = issued;
        books_returned = returned;
    }

    Opt_library::~~Opt_library()
    {
        cout << endl << "Destructing..." << endl;
    }

    int Opt_library::PreviousStatusOfTheCard()
    {
        if(books_issued > books_returned)
        {
            cout << endl << "No further operations can be made. Some books are
still not returned" << endl;
            cout << endl;
            return 1;
        }
        else if (books_issued == books_returned)
        {
            cout << endl;
            cout << "Card Number: " << card_number << endl;
            cout << "Valid days left: " << valid_days_left << endl;
            cout << "Books issued previously: " << books_issued << endl;
            cout << "Books returned previously: " << books_returned << endl;
            cout << endl << "          " << "The status has been cleared." << endl;
            cout << endl;
            return 0;
        }
    }

    int Opt_library::issue_books(int books)
    {
        if(valid_days_left < 15)
        {
            cout << endl << "Books cannot be issued, there are not enough days
left for the validity of card" << endl;
            cout << endl;
            return 0;
        }

        if(books > 2)
        {
            cout << endl << "          " << "More than 2 books can not be issued
at a time" << endl;
            cout << endl;
            return 1;
        }

        if(books <= 2 && valid_days_left >= 15)
        {
            Number_of_books = books;
            display();
            return 0;
        }
    }

    void Opt_library::display()
    {

```

```

        cout << endl << Number_of_books << " book(s), issued to the " << card_number
<< endl;
}

```

## main.cpp

```

#include <iostream>
using namespace std;
#include "class Opt_library.h"

int main(int argc, char** argv) {
    int id, days, issued, returned, books;

    cout << "Enter card number: ";
    cin >> id;

    cout << "Enter days left for the validation: ";
    cin >> days;

    cout << "Enter number of books issued previously: ";
    cin >> issued;
    while(issued < 0)
    {
        cout << endl << "Number of books issued can not be negative" << endl;
        cout << "Enter number of books issued previously: ";
        cin >> issued;
    }

    cout << "Enter number of books returned previously: ";
    cin >> returned;
    while(returned < 0)
    {
        cout << endl << "Number of books returned can not be negative" <<
endl;

        cout << "Enter number of books returned previously: ";
        cin >> returned;
    }

    while(issued < returned)
    {
        cout << endl << "Number of books returned can not be greater than
number of books issued" << endl;
        cout << endl;
        cout << "Enter number of books issued previously: ";
        cin >> issued;
        cout << "Enter number of books returned previously: ";
        cin >> returned;
    }

    Opt_library op(id, days, issued, returned);
    int flag1 = op.PreviousStatusOfTheCard();
    if(flag1)
    {
        return 0;
    }

    cout << "Please enter the number of books to be issued: ";
    cin >> books;

    int flag2 = op.issue_books(books);
    while(flag2)

```

```

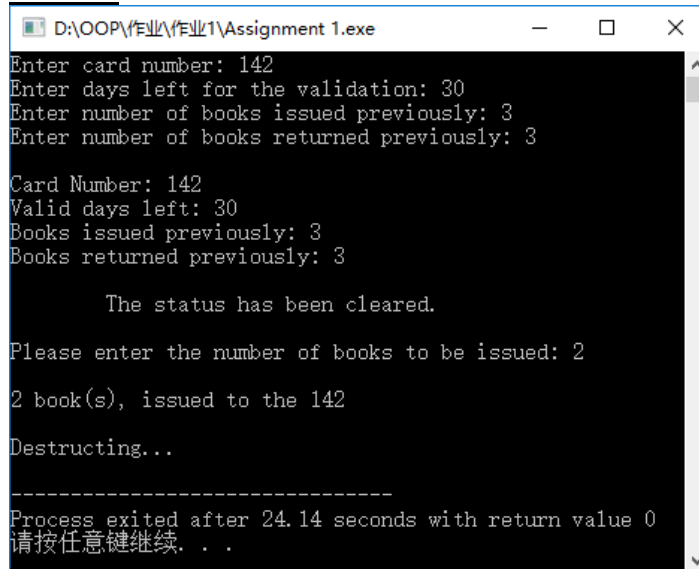
    {
        cout << "Please enter the number of books to be issued: ";
        cin >> books;
        flag2 = op.issue_books(books);
    }

    return 0;
}

```

## Test

### Test 1: when user enters 2 books to be issued



```

D:\OOP\作业\作业1\Assignment 1.exe
Enter card number: 142
Enter days left for the validation: 30
Enter number of books issued previously: 3
Enter number of books returned previously: 3

Card Number: 142
Valid days left: 30
Books issued previously: 3
Books returned previously: 3

    The status has been cleared.

Please enter the number of books to be issued: 2

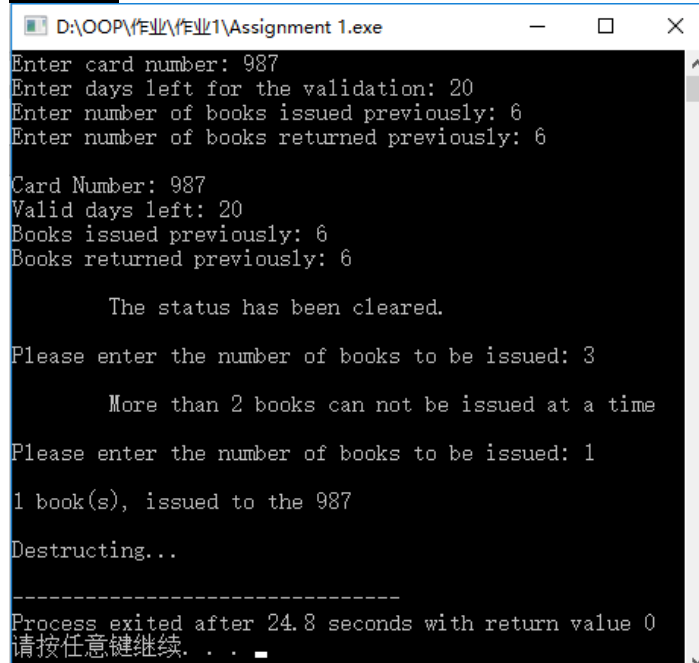
2 book(s), issued to the 142

Destructing...

-----
Process exited after 24.14 seconds with return value 0
请按任意键继续. . .

```

### Test 2: when user enters more than 2 books to be issued



```

D:\OOP\作业\作业1\Assignment 1.exe
Enter card number: 987
Enter days left for the validation: 20
Enter number of books issued previously: 6
Enter number of books returned previously: 6

Card Number: 987
Valid days left: 20
Books issued previously: 6
Books returned previously: 6

    The status has been cleared.

Please enter the number of books to be issued: 3

    More than 2 books can not be issued at a time

Please enter the number of books to be issued: 1

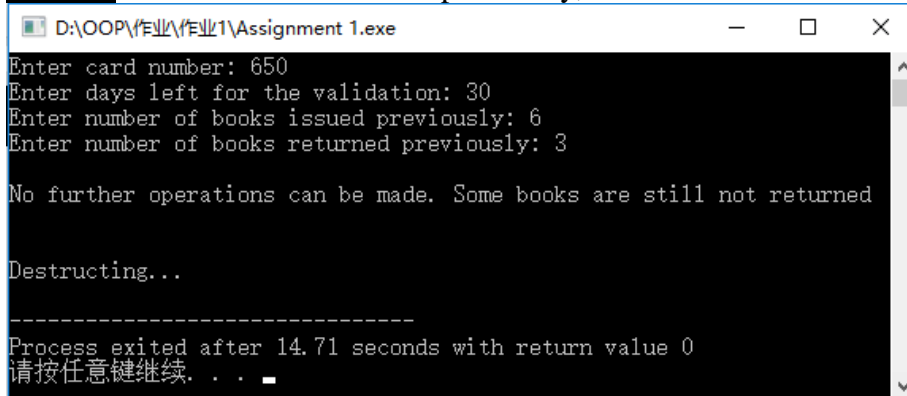
1 book(s), issued to the 987

Destructing...

-----
Process exited after 24.8 seconds with return value 0
请按任意键继续. . .

```

**Test 3:** when some books issued previously, have not been returned



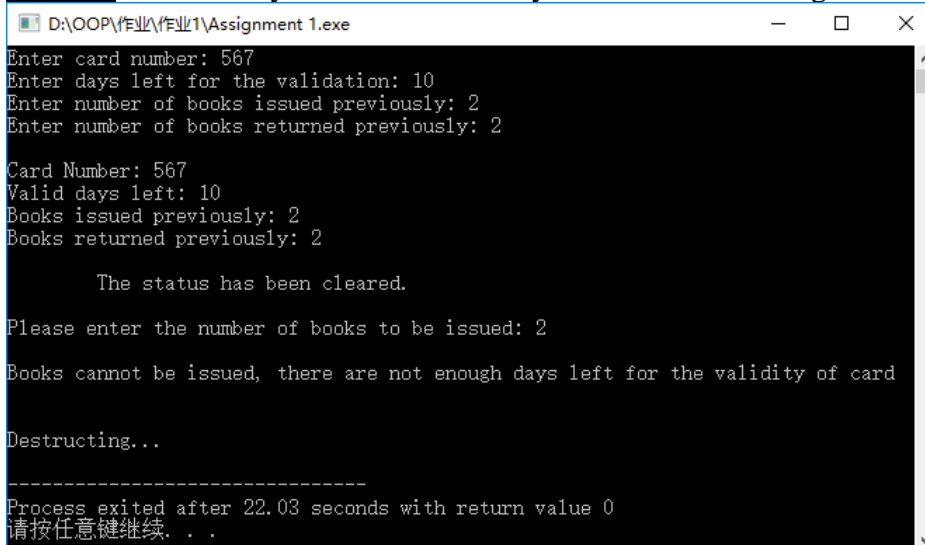
```
D:\OOP\作业\作业1\Assignment 1.exe
Enter card number: 650
Enter days left for the validation: 30
Enter number of books issued previously: 6
Enter number of books returned previously: 3

No further operations can be made. Some books are still not returned

Destructing...

-----
Process exited after 14.71 seconds with return value 0
请按任意键继续. . .
```

**Test 4:** when the days left for the validity of card are not enough



```
D:\OOP\作业\作业1\Assignment 1.exe
Enter card number: 567
Enter days left for the validation: 10
Enter number of books issued previously: 2
Enter number of books returned previously: 2

Card Number: 567
Valid days left: 10
Books issued previously: 2
Books returned previously: 2

The status has been cleared.

Please enter the number of books to be issued: 2
Books cannot be issued, there are not enough days left for the validity of card

Destructing...

-----
Process exited after 22.03 seconds with return value 0
请按任意键继续. . .
```

**Test 5:** when the user enters books\_returned which are more than books\_issued

```
D:\OOP\作业\作业1\Assignment 1.exe
Enter card number: 789
Enter days left for the validation: 30
Enter number of books issued previously: 2
Enter number of books returned previously: 3

Number of books returned can not be greater than number of books issued

Enter number of books issued previously: 2
Enter number of books returned previously: 2

Card Number: 789
Valid days left: 30
Books issued previously: 2
Books returned previously: 2

    The status has been cleared.

Please enter the number of books to be issued: 2

2 book(s), issued to the 789

Destructing...

-----
Process exited after 50.16 seconds with return value 0
请按任意键继续. . .
```