PIMPRI CHINCHWAD EDUCATION TRUST's.

PIMPRI CHINCHWAD COLLEGE OF ENGINEERING

(An Autonomous Institute)

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Class : SY BTech   **Acad. Yr. 2025-26**   **Semester :** I

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Department: Computer Engineering   **Division :** A

Course Name : Data Structures

Course Code: BCE23PC02

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Assignment No. 9

Problem Statement:

Develop a Book Return Cart in the Library:
        A book return cart receives returned books and stacks them. When reshelving, books are taken from the top.

Source Code :

```cpp
#include <iostream>

using namespace std;

#define SIZE 10


class BookCart {

    string cart[SIZE];

    int top;



public:
```

```cpp
    BookCart() {

        top = -1;

    }

    // add book (push)

    void returnBook(string book) {

        if (top == SIZE - 1){

            cout << "Cart is full!" << endl;

        } else {

            cart[++top] = book;

            cout << book << " returned." << endl;

        }

    }

    // take book (pop)

    void reshelveBook() {

        if (top == -1){

            cout << "Cart is empty!" << endl;

        } else {

            cout << cart[top--] << " reshelvedsucessfully!" << endl;


        }

    }

    // show books

    void display() {

        if (top == -1){

            cout << "Cart is empty." << endl;

        } else {

            cout << "Books in cart: ";
```

```cpp
            for (int i = top; i >= 0; i--)

                cout << cart[i] << "   ";

            cout << endl;

        }

    }

};


int main() {

    BookCart cart;


    cart.returnBook("DSA");

    cart.returnBook("MA");

    cart.returnBook("DE&VL");

    cart.returnBook("UHV");

    cart.returnBook("BSE");

    cart.display();


    cart.reshelveBook();

    cart.reshelveBook();


    cart.display();


    return 0;

}
```

Screen Shot of Output :

```
PS C:\C++ DSA> g++ practice_file.cpp
PS C:\C++ DSA> ./a.exe
DSA returned.
MA returned.
DE&VL returned.
UHV returned.
BSE returned.
Books in cart: BSE    UHV    DE&VL    MA    DSA
BSE reshelvedsucessfully!
UHV reshelvedsucessfully!
Books in cart: DE&VL    MA    DSA
PS C:\C++ DSA>
```

Conclusion:

The Book Return Cart in a library can be easily modeled using the stack data structure, as it follows the Last In, First Out (LIFO) principle. Books that are returned are placed on the top of the cart, and while reshelving, books are picked from the top first. This ensures a simple, efficient, and organized way of handling returned books in the library.