



# BCSL-21

## Solved Assignment



Course Code	:	BCSL-021
Course Title	:	C Language Programming
Assignment Number	:	BCA(II)/L-021/Assignment/2024-25
Maximum Marks	:	50
Weightage	:	25%
Last date of Submission	:	31 <sup>st</sup> October, 2024 (for July Session) 30 <sup>th</sup> April, 2025 (for January Session)

This assignment carries 40 marks. Rest 10 marks are for viva voce. You may use illustrations and diagrams to enhance the explanation. Please go through the guidelines regarding the assignments given in the programme guide for the format of presentation.	<table><tr><td>Course Code</td><td>:</td><td>BCSL-021</td></tr><tr><td>Course Title</td><td>:</td><td>C Language Programming</td></tr><tr><td>Assignment Number</td><td>:</td><td>BCA(II)/L-021/Assignment/2024-25</td></tr><tr><td>Maximum Marks</td><td>:</td><td>50</td></tr><tr><td>Weightage</td><td>:</td><td>25%</td></tr><tr><td>Last date of Submission</td><td>:</td><td>31<sup>st</sup> October, 2024 (for July Session) 30<sup>th</sup> April, 2025 (for January Session)</td></tr></table>	Course Code	:	BCSL-021	Course Title	:	C Language Programming	Assignment Number	:	BCA(II)/L-021/Assignment/2024-25	Maximum Marks	:	50	Weightage	:	25%	Last date of Submission	:	31 <sup>st</sup> October, 2024 (for July Session) 30 <sup>th</sup> April, 2025 (for January Session)	ies 40 marks. You may use illustrations and diagrams to enhance the explanation. Please go through the guidelines regarding the assignments given in the programme guide for the format of presentation.
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Q1. Design and implement a simple <i>Book-Organizing Module of a Library Management System</i> using C programming. This question carries 40 marks. Rest 10 marks are for viva voce. You may use illustrations and diagrams to enhance the explanation. Please go through the guidelines regarding the assignments given in the programme guide for the format of presentation.	<b>System using C (40 Marks)</b>
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**Description:**

Create a menu driven application that allows the user to manage the books in a library. The application should enable users to perform the following operations:

1. Add a new book record.
2. Display all book records.
3. Search a book by its ISBN.
4. Search a book by its Author.
5. Search a book by its Title.
6. Update a book record.
7. Delete a book record.
8. Save book records to a file.
9. Load book records from a file.
- 10.Exit.

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Implement the following functions:

- void addBook(Book books[], int \*count)
- void displayBooks(const Book books[], int count)
- int searchBookByISBN(const Book books[], int count, const char \*isbn)
- void updateBook(Book books[], int count, const char \*isbn)

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The application



- `void deleteBook(Book books[], int *count, const char *isbn)`
- `void saveToFile(const Book books[], int count, const char *filename)`
- `void loadFromFile(Book books[], int *count, const char *filename)`

#### **Menu**

- Implement a menu-driven system that allows the user to choose the operation they want to perform.

#### **File Handling**

- Use file handling to save the book records to a file and load them back when the program starts.

*Note: You must execute the program and submit the program logic, sample input and output along with the necessary documentation for this practical question. Assumptions can be made wherever necessary.*

## Program Structure

1. **Structure Definition:** We define a structure `Book` to represent a book with relevant fields.
2. **Function Prototypes:** Functions are implemented for each of the required operations such as adding, displaying, searching, updating, and deleting books, as well as file operations.

## Program Code

```
#include <stdio.h>
#include <string.h>
```

```
// Define the Book structure
struct Book {
    char isbn[20];
    char title[100];
    char author[100];
    int year;
};
```

```
typedef struct Book Book;
```

```
// Function prototypes
```

```
void addBook(Book books[], int *count);
void displayBooks(const Book books[], int count);
int searchBookByISBN(const Book books[], int count, const char *isbn);
void searchBookByAuthor(const Book books[], int count, const char *author);
void searchBookByTitle(const Book books[], int count, const char *title);
void updateBook(Book books[], int count, const char *isbn);
void deleteBook(Book books[], int *count, const char *isbn);
void saveToFile(const Book books[], int count, const char *filename);
void loadFromFile(Book books[], int *count, const char *filename);
```

```
// Main function with menu
```

```
int main() {
    Book books[100]; // Array to store books
    int count = 0;   // Number of books in the system
    int choice;
    char isbn[20], author[100], title[100];

    loadFromFile(books, &count, "books.txt"); // Load existing records from
file
```

```

while (1) {
    printf("\nLibrary Management System\n");
    printf("1. Add Book\n2. Display Books\n3. Search by ISBN\n4. Search by
Author\n");
    printf("5. Search by Title\n6. Update Book\n7. Delete Book\n8. Save to
File\n9. Exit\n");
    printf("Enter your choice: ");
    scanf("%d", &choice);
    getchar(); // Clear newline from input buffer

    switch (choice) {
        case 1:
            addBook(books, &count);
            break;
        case 2:
            displayBooks(books, count);
            break;
        case 3:
            printf("Enter ISBN to search: ");
            scanf("%s", isbn);
            int index = searchBookByISBN(books, count, isbn);
            if (index != -1) {
                printf("Book found: %s, %s, %s, %d\n", books[index].isbn,
books[index].title, books[index].author, books[index].year);
            } else {
                printf("Book not found!\n");
            }
            break;
        case 4:
            printf("Enter Author to search: ");
            scanf("%s", author);
            searchBookByAuthor(books, count, author);
            break;
        case 5:
            printf("Enter Title to search: ");
            scanf("%s", title);
            searchBookByTitle(books, count, title);
            break;
        case 6:
            printf("Enter ISBN to update: ");
            scanf("%s", isbn);
            updateBook(books, count, isbn);
            break;
    }
}

```

```

case 7:
    printf("Enter ISBN to delete: ");
    scanf("%s", isbn);
    deleteBook(books, &count, isbn);
    break;
case 8:
    saveToFile(books, count, "books.txt");
    break;
case 9:
    saveToFile(books, count, "books.txt"); // Save on exit
    printf("Exiting...\n");
    return 0;
default:
    printf("Invalid choice! Please try again.\n");
}
}
return 0;
}

```

**// Function to add a new book**

```

void addBook(Book books[], int *count) {
    printf("Enter ISBN: ");
    scanf("%s", books[*count].isbn);
    printf("Enter Title: ");
    scanf("%s", books[*count].title);
    printf("Enter Author: ");
    scanf("%s", books[*count].author);
    printf("Enter Year of Publication: ");
    scanf("%d", &books[*count].year);
    (*count)++;
    printf("Book added successfully!\n");
}

```

**// Function to display all books**

```

void displayBooks(const Book books[], int count) {
    if (count == 0) {
        printf("No books available!\n");
    } else {
        printf("\nDisplaying all books:\n");
        for (int i = 0; i < count; i++) {
            printf("ISBN: %s, Title: %s, Author: %s, Year: %d\n", books[i].isbn,
books[i].title, books[i].author, books[i].year);
        }
    }
}
}

```



**// Function to search a book by ISBN**

```
int searchBookByISBN(const Book books[], int count, const char *isbn) {  
    for (int i = 0; i < count; i++) {  
        if (strcmp(books[i].isbn, isbn) == 0) {  
            return i;  
        }  
    }  
    return -1;  
}
```

**// Function to search a book by Author**

```
void searchBookByAuthor(const Book books[], int count, const char *author)  
{  
    int found = 0;  
    for (int i = 0; i < count; i++) {  
        if (strcmp(books[i].author, author) == 0) {  
            printf("Book found: ISBN: %s, Title: %s, Author: %s, Year: %d\n",  
books[i].isbn, books[i].title, books[i].author, books[i].year);  
            found = 1;  
        }  
    }  
    if (!found) {  
        printf("No book found by Author: %s\n", author);  
    }  
}
```

**// Function to search a book by Title**

```
void searchBookByTitle(const Book books[], int count, const char *title) {  
    int found = 0;  
    for (int i = 0; i < count; i++) {  
        if (strcmp(books[i].title, title) == 0) {  
            printf("Book found: ISBN: %s, Title: %s, Author: %s, Year: %d\n",  
books[i].isbn, books[i].title, books[i].author, books[i].year);  
            found = 1;  
        }  
    }  
    if (!found) {  
        printf("No book found with Title: %s\n", title);  
    }  
}
```

**// Function to update a book record by ISBN**

```
void updateBook(Book books[], int count, const char *isbn) {  
    int index = searchBookByISBN(books, count, isbn);  
    if (index != -1) {  
        printf("Enter new Title: ");  
        scanf("%s", books[index].title);  
        printf("Enter new Author: ");  
        scanf("%s", books[index].author);  
        printf("Enter new Year: ");  
        scanf("%d", &books[index].year);  
        printf("Book updated successfully!\n");  
    } else {  
        printf("Book not found!\n");  
    }  
}
```

**// Function to delete a book record by ISBN**

```
void deleteBook(Book books[], int *count, const char *isbn) {  
    int index = searchBookByISBN(books, *count, isbn);  
    if (index != -1) {  
        for (int i = index; i < *count - 1; i++) {  
            books[i] = books[i + 1];  
        }  
        (*count)--;  
        printf("Book deleted successfully!\n");  
    } else {  
        printf("Book not found!\n");  
    }  
}
```

**// Function to save book records to a file**

```
void saveToFile(const Book books[], int count, const char *filename) {  
    FILE *fp = fopen(filename, "w");  
    if (fp == NULL) {  
        printf("Error opening file for saving!\n");  
        return;  
    }  
    fwrite(&count, sizeof(int), 1, fp); // Save the count  
    fwrite(books, sizeof(Book), count, fp); // Save the book records  
    fclose(fp);  
    printf("Book records saved to file successfully!\n");  
}
```



```
// Function to load book records from a file  
void loadFromFile(Book books[], int *count, const char *filename) {  
    FILE *fp = fopen(filename, "r");  
    if (fp == NULL) {  
        printf("No existing records found, starting fresh.\n");  
        return;  
    }  
    fread(count, sizeof(int), 1, fp); // Load the count  
    fread(books, sizeof(Book), *count, fp); // Load the book records  
    fclose(fp);  
    printf("Book records loaded from file successfully!\n");  
}
```



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