```c
/*Specifications:
Variables: Book title, author, ISBN, and availability.
Static & Const: Static variable for total books; const for maximum library size.
Switch Case: Menu for adding, issuing, returning, and displaying books.
Looping Statements: Loop to iterate over the list of books.
Pointers: Pointer to allocate memory for book titles dynamically.
Functions: Functions for adding, issuing, returning, and displaying books.
Arrays: Store book details.
Structures: Structure for book details.
Nested Structures: Nested structures for book details and status.
Unions: Union for storing multiple formats of book ID.
Nested Unions: Nested union to store book or journal identifiers.
Output Expectations: Display all books with their status.
Menu Example:
1. Add Book
2. Issue Book
3. Return Book
4. Display All Books
5. Exit
has context menu

*/
#include<stdio.h>
#include<string.h>
#include<stdlib.h>
#include<ctype.h>
#define max 20//number of books
struct Availability
{
    int copies;
    int available;
    char status[20];
};
union  BookId
{
    int id1;
    char id2[5];
};
union Booktype
```

```
{
    char j[20];
    char b[20];
};
struct Books
{
    char title[20];
    char author[20];
    struct Availability availability;
    union BookId id;
    int idtype;
    union Booktype type;
};
struct Books books[20];

static int totalbooks =0;

void Add()
{
    int id;
    struct Books * newbook=(struct Books *)malloc(sizeof(struct Books));
    newbook = &books[totalbooks];
    printf("Enter Book id type 1.numeric 2.alphanumeric : ");
    scanf("%d",&newbook->idtype);
    if(id==1)
    {
        printf("Enter numeric id : ");
        scanf("%d",&newbook->id.id1);
    }
    else
    {
       printf("Enter alphanumeric id : ");
        scanf("%s",newbook->id.id2);
    }
    printf("Enter book title : ");
    scanf("%s",newbook->title);
    printf("Enter book author : ");
    scanf("%s",newbook->author);
    printf("Enter total copies  : ");
    scanf("%d",&newbook->availability.copies);
```

```
    printf("Eneter available copies : ");
    scanf("%d",&newbook->availability.available);
    if(newbook->availability.copies <=newbook->availability.available)
    strcpy(newbook->availability.status,"Available");
    else
    strcpy(newbook->availability.status,"Unavailable");
    totalbooks++;
    printf("Book has been added to library\n");
}
void Display()
{

    for(int i=0;i<totalbooks;i++)
    {
        if(books[i].idtype==1)
        printf("Boook Id : %d\n",books[i].id.id1);
        else
        printf("Boook Id : %s\n",books[i].id.id2);
        printf("Book Title : %s\n",books[i].title);
        printf("Books Author : %s\n",books[i].author);
        printf("Book Copies : %d\n",books[i].availability.copies);
        printf("Books Available Copies :
%d\n",books[i].availability.available);
        printf("Book Status : %s\n",books[i].availability.status);
        printf("\n");
    }
}
void Issue()
{
    char name[20];
    printf("Enter the name of book to issue : ");
    scanf("%s",name);
    for(int i=0;i<totalbooks;i++)
    {
        if(strcmp(books[i].title,name)==0)
        {
            if(books[i].availability.available==0)
            printf("All copies of this book has been issued\n");
            else
            {
```

```
                books[i].availability.available--;
                printf("Book issued\n");
                if(books[i].availability.available==0)
                strcpy(books[i].availability.status,"Unavailable");
            }
        }
        else
        printf("Book not found\n");
    }
}
void Return()
{
    char name[20];
    printf("Enter name of book to return : ");
    scanf("%s",name);
    for(int i=0;i<totalbooks;i++)
    {
        if(strcmp(books[i].title,name)==0)
        {

if(books[i].availability.copies==books[i].availability.available)
            printf("The library is in posession of all the copies of this
books\n");
            else
            {
            if(books[i].availability.available==0)
            {
                strcpy(books[i].availability.status,"Available");
                books[i].availability.available++;
                printf("Book returned\n");
            }
            else
            {
                books[i].availability.available++;
                printf("Book returned\n");
            }
            }

        }
        else
```

```
        printf("This book is not part of this library\n");
    }
}
void main()
{
int choice;
do
{
    printf("1. Add Book\n");
printf("2. Issue Book\n");
printf("3. Return Book\n");
printf("4. Display All Books\n");
printf("5. Exit\n");
printf("Enter choice : ");
scanf("%d",&choice);
switch(choice)
{
    case 1:Add();
    break;
    case 2:Issue();
    break;
    case 3:Return();
    break;
    case 4:Display();
    break;
    case 5:printf("Exiting....\n");
    break;
    break;
    default : printf("Enter a valid choice\n");
    break;

}
} while (choice !=5);

}
```

```
1. Add Book
2. Issue Book
3. Return Book
4. Display All Books
5. Exit
Enter choice : 1
Enter Book id type 1.numeric 2.alphanumeric
Enter numeric id : 101
Enter book title : t1
Enter book author : a1
Enter total copies  : 2
Eneter available copies : 1
Book has been added to library
1. Add Book
2. Issue Book
3. Return Book
4. Display All Books
5. Exit
Enter choice : 4
NBoook Id : 101
Book Title : t1
Books Author : a1
Book Copies : 2
Books Available Copies : 1
Book Status : Unavailable

1. Add Book
2. Issue Book
3. Return Book
4. Display All Books
5. Exit
Enter choice : 2
Enter the name of book to issue : t1
Book issued
1. Add Book
2. Issue Book
3. Return Book
4. Display All Books
5. Exit
Enter choice : 4
```

```
Enter choice : 4
NBoook Id : 101
Book Title : t1
Books Author : a1
Book Copies : 2
Books Available Copies : 0
Book Status : Unavailable

1. Add Book
2. Issue Book
3. Return Book
4. Display All Books
5. Exit
Enter choice : 2
Enter the name of book to issue : t1
All copies of this book has been issued
1. Add Book
2. Issue Book
3. Return Book
4. Display All Books
5. Exit
Enter choice : 3
Enter name of book to return : t1
Book returned
1. Add Book
2. Issue Book
3. Return Book
4. Display All Books
5. Exit
Enter choice : 4
NBoook Id : 101
Book Title : t1
Books Author : a1
Book Copies : 2
Books Available Copies : 1
Book Status : Available

1. Add Book
2. Issue Book
3. Return Book
4. Display All Books
```

```
5. Exit
Enter choice : 3
Enter name of book to return : t1
Book returned
1. Add Book
2. Issue Book
3. Return Book
4. Display All Books
5. Exit
Enter choice : 4
NBoook Id : 101
Book Title : t1
Books Author : a1
Book Copies : 2
Books Available Copies : 2
Book Status : Available

1. Add Book
2. Issue Book
3. Return Book
4. Display All Books
5. Exit
Enter choice : 3
Enter name of book to return : t1
The library is in posession of all the copies of this books
1. Add Book
2. Issue Book
3. Return Book
4. Display All Books
5. Exit
Enter choice :
```