***MINI*** ***Project***

***On***

***“Library Management System”***

***GROUP MEEMBERS ::***

* **MUHAMMAD MUSTAFA**
* **USAMA SARDAR**
* **SHAHEER KHAN**

***SUBJECT : DATA STRUCTURE***

***DATE :: 21-01-2023***

**#include<iostream>**

**using namespace std;**

**#include <stdlib.h>**

**#include <string.h>**

**struct book{**

**string name;**

**string author;**

**int id;**

**book \*next;**

**};**

**struct student{**

**string name;**

**string email;**

**string book;**

**int id;**

**student \*next,\*prev;**

**};**

**book \*start\_lib=NULL;**

**student \*start=NULL;**

**void Available\_books(book\*);**

**void Search\_book(book\*);**

**void Search\_byBookName(book\*);**

**void Search\_byBookId(book\*);**

**void Search\_byBookAuthor(book\*);**

**book \*initialize\_lib( book \*);**

**student \*book\_issue( student \*);**

**student \*book\_return( student \*);**

**void display( student \*);**

**void STRING(){**

**cout<<"\n\n";**

**cout<<"\t\t\t \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n";**

**cout<<"\t\t\t \* \*\n";**

**cout<<"\t\t\t \* \*\n";**

**cout<<"\t\t\t \* ---------------------------- \*\n";**

**cout<<"\t\t\t \* WELCOME TO STUDENT LIBRARY \*\n";**

**cout<<"\t\t\t \* ---------------------------- \*\n";**

**cout<<"\t\t\t \* \*\n";**

**cout<<"\t\t\t \* \*\n";**

**cout<<"\t\t\t \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n";**

**cout<<"\n\n";**

**cout<<"\t\t\t \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n";**

**cout<<"\t\t\t \* \*\n";**

**cout<<"\t\t\t \* ------------------------ \*\n";**

**cout<<"\t\t\t \* STUDENT LIBRARY \*\n";**

**cout<<"\t\t\t \* ------------------------ \*\n";**

**cout<<"\t\t\t \* \*\n";**

**cout<<"\t\t\t \* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* \*\n";**

**cout<<"\t\t\t \* \* USAMA SARDAR \* \*\n";**

**cout<<"\t\t\t \* \* M.MUSTAFA \* \*\n";**

**cout<<"\t\t\t \* \* SHAHEER KHAN \* \*\n";**

**cout<<"\t\t\t \* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* \*\n";**

**cout<<"\t\t\t \* \*\n";**

**cout<<"\t\t\t \* \*\n";**

**cout<<"\t\t\t \* PROJECT FOR LIBRARY MANAGMENT \*\n";**

**cout<<"\t\t\t \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n";**

**}**

**int main(){**

**start\_lib= initialize\_lib(start\_lib);**

**STRING();**

**int choice;**

**do{**

**cout<<"\n\t\t\t\t MAIN FUNCTION: ";**

**cout<<"\n\t\t\t\t 1.BOOKS available in library ";**

**cout<<"\n\t\t\t\t 2.Search a book in libraray ";**

**cout<<"\n\t\t\t\t 3.ISSUE OF BOOKS ";**

**cout<<"\n\t\t\t\t 4.RETURN OF BOOKS ";**

**cout<<"\n\t\t\t\t 5.DISPLAY STUDENT DETAILS ";**

**cout<<"\n\t\t\t\t 6.EXIT\n ";**

**cout<<"\t\t\t \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n";**

**cout<<"\n\t\t\t\t Enter your choice: ";**

**cin>>choice;**

**switch(choice){**

**case 1:{**

**Available\_books(start\_lib);**

**break;**

**}**

**case 2:{**

**Search\_book(start\_lib);**

**break;**

**}**

**case 3:{**

**start=book\_issue(start);**

**break;**

**}**

**case 4:{**

**start=book\_return(start);**

**break;**

**}**

**case 5:{**

**display(start);**

**break;**

**}**

**case 6:{**

**exit(1);**

**}**

**default:{**

**cout<<"\n\t\t\t\t ...Invalid Option!...\n";**

**cout<<"\n\t\t\t\t Press any key to try again: ";**

**}**

**}**

**}while(choice!=6);**

**return 0;**

**}**

**void Search\_book(book\* start\_lib){**

**int choice;**

**do{**

**cout<<"\n\t\t\t\t Enter your choice , By which you wanna search the book : ";**

**cout<<"\n\t\t\t\t 1.Search book by name ";**

**cout<<"\n\t\t\t\t 2.Search book by his id ";**

**cout<<"\n\t\t\t\t 3.Search book by author name ";**

**cout<<"\n\t\t\t\t 4.Return to main ";**

**cout<<"\n\t\t\t\t 5.Exit "<<endl;**

**cin>>choice;**

**switch(choice){**

**case 1:{**

**Search\_byBookName(start\_lib);**

**break;**

**}**

**case 2:{**

**Search\_byBookId(start\_lib);**

**break;**

**}**

**case 3:{**

**Search\_byBookAuthor(start\_lib);**

**break;**

**}**

**case 4:{**

**main();**

**}**

**case 5:{**

**exit(1);**

**}**

**default:{**

**cout<<"\n\t\t\t\t ...Invalid Option!...\n";**

**cout<<"\n\t\t\t\t Press any key to try again: ";**

**}**

**}**

**}while(choice!=5);**

**}**

**void Search\_byBookName(book\* start\_lib){**

**book\* ptr=start\_lib;**

**int flag;**

**string book\_name;**

**cout<<"Enter book name , on which you wanna search book : "<<endl;**

**cin>>book\_name;**

**while(ptr!=NULL){**

**if(ptr->name==book\_name){**

**flag=1;**

**cout<<"Book is Available : ";**

**cout<<"\n\t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n";**

**cout<<"\n\t Book Title:"<<ptr->name;**

**cout<<"\n\t Name of Author:"<<ptr->author;**

**cout<<"\n\t Book ID:"<<ptr->id;**

**cout<<"\n\t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n";**

**break;**

**}**

**ptr=ptr->next;**

**}**

**if(flag!=1){**

**cout<<"Book is not available on that book name:";**

**}**

**}**

**void Search\_byBookId(book\* start\_lib){**

**book\* ptr=start\_lib;**

**int book\_id,flag=0;**

**cout<<"Enter book id , on which you wanna search book : "<<endl;**

**cin>>book\_id;**

**while(ptr!=NULL){**

**if(ptr->id==book\_id){**

**flag=1;**

**cout<<"Book is Available : ";**

**cout<<"\n\t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n";**

**cout<<"\n\t Book Title:"<<ptr->name;**

**cout<<"\n\t Name of Author:"<<ptr->author;**

**cout<<"\n\t Book ID:"<<ptr->id;**

**cout<<"\n\t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n";**

**break;**

**}**

**ptr=ptr->next;**

**}**

**if(flag!=1){**

**cout<<"Book is not available on that ID:";**

**}**

**}**

**void Search\_byBookAuthor(book\* start\_lib){**

**book\* ptr=start\_lib;**

**string book\_author\_name;**

**int flag;**

**cout<<"Enter author name , on which you wanna search book : "<<endl;**

**cin>>book\_author\_name;**

**while(ptr!=NULL){**

**if(ptr->author==book\_author\_name){**

**flag=1;**

**cout<<"Book is Available : ";**

**cout<<"\n\t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n";**

**cout<<"\n\t Book Title:"<<ptr->name;**

**cout<<"\n\t Name of Author:"<<ptr->author;**

**cout<<"\n\t Book ID:"<<ptr->id;**

**cout<<"\n\t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n";**

**break;**

**}**

**ptr=ptr->next;**

**}**

**if(flag!=1){**

**cout<<"Book is not available on that author name :";**

**}**

**}**

**book\* initialize\_lib( book \*start\_lib){**

**book \*ptr,\*new\_book1,\*new\_book2,\*new\_book3,\*new\_book4,\*new\_book5,\*new\_book6,\*new\_book7,\*new\_book8,\*new\_book9,\*new\_book10;**

**new\_book1=new book;**

**new\_book1->next=NULL;**

**start\_lib=new\_book1;**

**new\_book1->name="COA";**

**new\_book1->author="SadatSir";**

**new\_book1->id=101;**

**ptr=new\_book1;**

**new\_book2=new book;**

**new\_book2->next=NULL;**

**new\_book2->name="DifferentialEquation";**

**new\_book2->author="MushtaqSir";**

**new\_book2->id=102;**

**ptr->next=new\_book2;**

**ptr=new\_book2;**

**new\_book3=new book;**

**new\_book3->next=NULL;**

**new\_book3->name="DataStructure";**

**new\_book3->author="ShamsSir";**

**new\_book3->id=103;**

**ptr->next=new\_book3;**

**ptr=new\_book3;**

**new\_book4=new book;**

**new\_book4->next=NULL;**

**new\_book4->name="ProfessionalEthics";**

**new\_book4->author="ColJaveed";**

**new\_book4->id=104;**

**ptr->next=new\_book4;**

**ptr=new\_book4;**

**new\_book5=new book;**

**new\_book5->next=NULL;**

**new\_book5->name="DiscreteStructure";**

**new\_book5->author="HamidullahSir";**

**new\_book5->id=105;**

**ptr->next=new\_book5;**

**ptr=new\_book5;**

**new\_book6=new book;**

**new\_book6->next=NULL;**

**new\_book6->name="DataScience";**

**new\_book6->author="HammadSir";**

**new\_book6->id=106;**

**ptr->next=new\_book6;**

**ptr=new\_book6;**

**new\_book7=new book;**

**new\_book7->next=NULL;**

**new\_book7->name="Islamyat";**

**new\_book7->author="AdnanSir";**

**new\_book7->id=107;**

**ptr->next=new\_book7;**

**ptr=new\_book7;**

**new\_book8=new book;**

**new\_book8->next=NULL;**

**new\_book8->name="ProgrammingFundamentals";**

**new\_book8->author="FaisalSir";**

**new\_book8->id=108;**

**ptr->next=new\_book8;**

**ptr=new\_book8;**

**new\_book9=new book;**

**new\_book9->next=NULL;**

**new\_book9->name="Statistics";**

**new\_book9->author="IrfanSir";**

**new\_book9->id=109;**

**ptr->next=new\_book9;**

**ptr=new\_book9;**

**new\_book10=new book;**

**new\_book10->next=NULL;**

**new\_book10->name="ArtificialIntelligance";**

**new\_book10->author="OsmanSir";**

**new\_book10->id=110;**

**ptr->next=new\_book10;**

**ptr=new\_book10;**

**return start\_lib;**

**}**

**void Available\_books(book\* start\_lib){**

**int i=1;**

**cout<<"\n\t\*\*\*\*\*\*\*\* Books Available: \*\*\*\*\*\*\*\*\*\*\*\*\*\n";**

**for(book \*ptr=start\_lib;ptr!=NULL;ptr=ptr->next){**

**cout<<"\n\t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n";**

**cout<<"\n\t Book :"<<i;**

**cout<<"\n\t Book Title:"<<ptr->name;**

**cout<<"\n\t Name of Author:"<<ptr->author;**

**cout<<"\n\t Book ID:"<<ptr->id;**

**cout<<"\n\t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n";**

**i++;**

**}**

**}**

**student\* book\_issue( student \*start ){**

**book \*ptr;**

**student \*ptr2,\*new\_student;**

**int id,flag=0;**

**if(start\_lib==NULL){**

**cout<<"\n\t\t\t\t No books left in the library to issue!\n\t\t\t Sorry for the inconvenience!\n";**

**}else{**

**cout<<"\n\n\t Enter the Book ID: ";**

**cin>>id;**

**ptr=start\_lib;**

**while(ptr!=NULL){**

**if(ptr->id==id){**

**flag=1;**

**break;**

**}**

**ptr=ptr->next;**

**}**

**if(flag==1){**

**new\_student=new student;**

**cout<<"\n\t Enter Student Details:\n ";**

**cout<<"\n\t Enter your Name: ";**

**cin>>new\_student->name;**

**cout<<"\n\t Enter your Email: ";**

**cin>>new\_student->email;**

**new\_student->book=ptr->name;**

**new\_student->id=ptr->id;**

**new\_student->next=NULL;**

**cout<<"\n\t Issue of Book ID done successfully!\n";**

**cout<<"\n\n\t\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n";**

**if(start==NULL){**

**start=new\_student;**

**}else{**

**ptr2=start;**

**while(ptr2->next!=NULL){**

**ptr2=ptr2->next;**

**}**

**ptr2->next=new\_student;**

**}**

**}**

**else{**

**cout<<"\n\t\t ...Invalid Option!...\n";**

**cout<<"\n\t\t Press any key to try again: ";**

**}**

**}**

**return start;**

**}**

**student\* book\_return( student \*start){**

**student \*prev=start;**

**int flag=0,identity;**

**string name;**

**cout<<"\n\n\t\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Books Submission: \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n";**

**cout<<"\n\n\t Enter your Book ID: ";**

**cin>>identity;**

**cout<<"\n\n\t Enter student name: ";**

**cin>>name;**

**if(start->id==identity && start->name==name)**

**{**

**flag=1;**

**cout<<"\n\t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n";**

**cout<<"\n\t Student Name:"<<start->name;**

**cout<<"\n\t Student Email:"<<start->email;**

**cout<<"\n\t Name of Book Issued:"<<start->book;**

**cout<<"\n\t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n";**

**cout<<"\n\n\t Return of Book ID done successfully! "<<identity;**

**cout<<"\n\n\t\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n";**

**start=start->next;**

**delete(prev);**

**}**

**student \*ptr;**

**for(ptr=prev->next; ptr!=NULL; ptr=ptr->next){**

**if(ptr->id==identity && ptr->name==name)**

**{**

**flag=1;**

**cout<<"\n\t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n";**

**cout<<"\n\t Student Name:"<<ptr->name;**

**cout<<"\n\t Student Email:"<<ptr->email;**

**cout<<"\n\t Name of Book Issued:"<<ptr->book;**

**cout<<"\n\t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n";**

**cout<<"\n\n\t Return of Book ID done successfully! "<<identity;**

**cout<<"\n\n\t\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n";**

**prev->next=ptr->next;**

**delete(ptr);**

**break;**

**}**

**prev=prev->next;**

**}**

**if(flag!=1){**

**cout<<"\n\t Sorry the book doesn't exist in record ! Please recheck the entered ID and Name";**

**}**

**return start;**

**}**

**void display( student \*start){**

**student \*ptr;**

**ptr=start;**

**int flag;**

**cout<<"\n\n\t\*\*\*\*\*\*\*\*\*\*\*\*\* Details of Students: \*\*\*\*\*\*\*\*\*\*\*\*\*\*\n";**

**while(ptr!=NULL){**

**flag=1;**

**cout<<"\n\t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n";**

**cout<<"\n\t\t Student Name:"<<ptr->name;**

**cout<<"\n\t\t Student Email:"<<ptr->email;**

**cout<<"\n\t\t Name of Book Issued:"<<ptr->book;**

**cout<<"\n\t\t Book ID:"<<ptr->id;**

**cout<<"\n\t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n";**

**cout<<"\n\n\t\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n";**

**ptr=ptr->next;**

**}**

**if(flag!=1){**

**cout<<"\n\n\t \*\*\*\*\*\*\*\*\* NO BOOK ISSUE YET : \*\*\*\*\*\*\*\*\* \n\n";**

**}**

**}**