#include<iostream>

#include<fstream>

using namespace std;

struct Date{ // to store date

int dd,mm,yy;

};

struct Booksrec{ // to store the issue books

char a[40];

};

class Base{ // this class contain basic funtion for derived class

protected:

char FName[20];

char LName[20];

char Department[50];

Date Issue;

int Limit,Id,Blimit;

int Issuebooks,Fine,Hbook;

fstream file;

public:

Base(){

Hbook=0;// books the issue

}

void Bookissue(){

if(Fine==0){

if(Hbook<Blimit){

cout<<"You issue book"<<endl<<"Please enter the date of issue (dd/mm/yyyy)";

cin>>Issue.dd>>Issue.mm>>Issue.yy;

Hbook++;

}

else{

cout<<"You have cross the limit ";

}

}

else{

cout<<"Please pay your fine ";

}

}

void Rebook(){ //Return the book

Hbook--;

}

virtual void Add()=0;

virtual void Show()=0;

string Retrunlname(){

string g;

g = LName;

return g;

}

string Retrunfname(){

string g;

g = FName;

return g;

}

int Retrunid(){

return Id;

}

void Addfine(){ // to add fine

int a=0;

cout<<"Enter fine ";cin>>a;

Fine +=a;

cout<<"Your fine is "<<Fine;

}

void Payfine(){

cout<<"Your fine is "<<Fine <<"Enter pay amount of fine";

int a;

cin>>a;

Fine -=a;

cout<<"Your fine is "<<Fine ;

}

};

class Book{

char Btitle[30];

char Author[30];

char dis[100];

int Id,Rack,Shelf;

char Pname[30];

Date date;

public:

void Add(){ // To add a book

cout<<"Enter book title";cin>>Btitle;

cout<<"Enter Author name";cin>>Author;

cout<<"Enter short discription";cin.getline(dis,100);

cout<<"Enter book ID ";cin>>Id;

cout<<"Enter publisher name ";cin>>Pname;

cout<<"Enter publisher date (dd/mm/yyyy) ";cin>>date.dd>>date.mm>>date.yy;

cout<<"Enter book location (Rack no./Shelf no.)";cin>>Rack>>Shelf;

}

void Show(){

cout<<"book title"<<Btitle<<endl;

cout<<"Author name"<<Author<<endl;

cout<<"short discription"<<dis<<endl;

cout<<"book ID "<<Id<<endl;

cout<<"publisher name "<<Pname<<endl;

cout<<"publisher date (dd/mm/yyyy) "<<date.dd<<date.mm<<date.yy<<endl;

cout<<"book location (Rack no./Shelf no.)"<<Rack<<Shelf<<endl;

}

string Bna(){ // return book title

return Btitle;

}

string Bau(){ // return book author name

return Author;

}

int Bid(){ // return book id

return Id;

}

};

class Student : public Base{

float CGPA;

public:

void Add(){ // To add a student

Limit = 7;Blimit =1;

cout<<"Enter your Fisrt name";cin>>FName;

cout<<"Enter your Last name";cin>>LName;

cout<<"Enter your Department";cin>>Department;

cout<<"Enter your ID ";cin>>Id;

cout<<"Enter your CPGA";cin>>CGPA;

cout<<"Your limit to issue a book for days "<<Limit;

Issuebooks =0 ;

}

void Show(){

cout<<"Your Fisrt name "<<FName<<endl;

cout<<"Your Last name "<<LName<<endl;

cout<<"Your Department "<<Department<<endl;

cout<<"Your CPGA "<<CGPA<<endl;

cout<<"Your ID "<<Id<<endl;

cout<<"Your limit to issue a book for days "<<Limit<<endl;

cout<<"You can issue only "<<Blimit<<" books"<<endl;

cout<<"You issue books "<<Issuebooks;

}

};

class Teacher : public Base{

int Yxp; // to store the Number of year experiance

char Qualification[20];

public:

void Add(){ // To add a student

Limit = 30;Blimit =7;

cout<<"Enter your Fisrt name";cin>>FName;

cout<<"Enter your Last name";cin>>LName;

cout<<"Enter your Department";cin>>Department;

cout<<"Enter your ID ";cin>>Id;

cout<<"Enter your Qualification ";cin>>Qualification ;

cout<<"Enter your Experiance year ";cin>>Yxp ;

cout<<"Your limit to issue a book for days "<<Limit;

Issuebooks = 0;

}

void Show(){

cout<<"Your Fisrt name "<<FName<<endl;

cout<<"Your Last name "<<LName<<endl;

cout<<"Your Department "<<Department<<endl;

cout<<"Your ID "<<Id<<endl;

cout<<"Your Qualification "<<Qualification<<endl ;

cout<<"Your Experiance year "<<Yxp<<endl ;

cout<<"Your limit to issue a book for days "<<Limit<<endl;

cout<<"You can issue only "<<Blimit<<" books"<<endl;

cout<<"You issue books "<<Issuebooks;

}

};

class staff : public Base{

int Yxp; // to store the Number of year experiance

int Grade;

public:

void Add(){ // To add a student

Limit = 15;Blimit =4;

cout<<"Enter your Fisrt name ";cin>>FName;

cout<<"Enter your Last name ";cin>>LName;

cout<<"Enter your ID ";cin>>Id;

cout<<"Enter your Grade ";cin>>Grade ;

cout<<"Enter your Experiance year ";cin>>Yxp ;

cout<<"Your limit to issue a book for days "<<Limit;

Issuebooks = 0;

}

void Show(){

cout<<"Your Fisrt name "<<FName<<endl;

cout<<"Your Last name "<<LName<<endl;

cout<<"Your ID "<<Id<<endl;

cout<<"Your grade is"<<Grade<<endl ;

cout<<"Enter your Experiance year "<<Yxp<<endl ;

cout<<"Your limit to issue a book for days "<<Limit<<endl;

cout<<"You can issue only "<<Blimit<<" books"<<endl;

cout<<"You issue books "<<Issuebooks;

}

};

class Librarystaff : public Base{

int Yxp; // to store the Number of year experiance

int Grade;

public:

void Add(){ // To add a student

Limit = 15;Blimit =4;

cout<<"Enter your Fisrt name ";cin>>FName;

cout<<"Enter your Last name ";cin>>LName;

cout<<"Enter your ID ";cin>>Id;

cout<<"Enter your Grade ";cin>>Grade ;

cout<<"Enter your Experiance year ";cin>>Yxp ;

cout<<"Your limit to issue a book for days "<<Limit;

Issuebooks = 0;

}

void Show(){

cout<<"Your Fisrt name "<<FName<<endl;

cout<<"Your Last name "<<LName<<endl;

cout<<"Your ID "<<Id<<endl;

cout<<"Your grade is"<<Grade<<endl ;

cout<<"Enter your Experiance year "<<Yxp<<endl ;

cout<<"Your limit to issue a book for days "<<Limit<<endl;

cout<<"You can issue only "<<Blimit<<" books"<<endl;

cout<<"You issue books "<<Issuebooks;

}

};

void LseId(Librarystaff a[50]){ // to serach the Librarystaff by ID

int id;

int f=0;

cout<<"Enter id";

cin>>id;

for(int c=0;c<50;c++){

if(id==a[c].Retrunid()){

a[c].Show();

f=1;

break;

}

}

if(f==0){

cout<<"Not available";

}

}

void Lsefname(Librarystaff a[50]){ // to serach the Librarystaff by First name

int f=0;

string g;

cout<<"Enter First name";

cin>>g;

for(int c=0;c<50;c++){

if(g==a[c].Retrunfname()){

a[c].Show();

f=1;

break;

}

}

if(f==0){

cout<<"Not available";

}

}

void Lselname(Librarystaff a[50]){ // to serach the Librarystaff by last name

int f=0;

string g;

cout<<"Enter First name";

cin>>g;

for(int c=0;c<50;c++){

if(g==a[c].Retrunfname()){

a[c].Show();

f=1;

break;

}

}

if(f==0){

cout<<"Not available";

}

}

void SeId(staff a[50]){ // to serach the staff by ID

int id;

int f=0;

cout<<"Enter id";

cin>>id;

for(int c=0;c<50;c++){

if(id==a[c].Retrunid()){

a[c].Show();

f=1;

break;

}

}

if(f==0){

cout<<"Not available";

}

}

void Sefname(staff a[50]){ // to serach the staff by First name

int f=0;

string g;

cout<<"Enter First name";

cin>>g;

for(int c=0;c<50;c++){

if(g==a[c].Retrunfname()){

a[c].Show();

f=1;

break;

}

}

if(f==0){

cout<<"Not available";

}

}

void Selname(staff a[50]){ // to serach the staff by last name

int f=0;

string g;

cout<<"Enter First name";

cin>>g;

for(int c=0;c<50;c++){

if(g==a[c].Retrunfname()){

a[c].Show();

f=1;

break;

}

}

if(f==0){

cout<<"Not available";

}

}

void TseId(Teacher a[50]){ // to serach the Teacher by ID

int id;

int f=0;

cout<<"Enter id";

cin>>id;

for(int c=0;c<50;c++){

if(id==a[c].Retrunid()){

a[c].Show();

f=1;

break;

}

}

if(f==0){

cout<<"Not available";

}

}

void Tsefname(Teacher a[50]){ // to serach the teacher by First name

int f=0;

string g;

cout<<"Enter First name";

cin>>g;

for(int c=0;c<50;c++){

if(g==a[c].Retrunfname()){

a[c].Show();

f=1;

break;

}

}

if(f==0){

cout<<"Not available";

}

}

void Tselname(Teacher a[50]){ // to serach the teacher by last name

int f=0;

string g;

cout<<"Enter First name";

cin>>g;

for(int c=0;c<50;c++){

if(g==a[c].Retrunfname()){

a[c].Show();

f=1;

break;

}

}

if(f==0){

cout<<"Not available";

}

}

void SseId(Student a[50]){ // to serach the Student by ID

int id;

int f=0;

cout<<"Enter id";

cin>>id;

for(int c=0;c<50;c++){

if(id==a[c].Retrunid()){

a[c].Show();

f=1;

break;

}

}

if(f==0){

cout<<"Not available";

}

}

void Ssefname(Student a[50]){ // to serach the Student by First name

int f=0;

string g;

cout<<"Enter First name";

cin>>g;

for(int c=0;c<50;c++){

if(g==a[c].Retrunfname()){

a[c].Show();

f=1;

break;

}

}

if(f==0){

cout<<"Not available";

}

}

void Sselname(Student a[50]){ // to serach the Student by last name

int f=0;

string g;

cout<<"Enter First name";

cin>>g;

for(int c=0;c<50;c++){

if(g==a[c].Retrunfname()){

a[c].Show();

f=1;

break;

}

}

if(f==0){

cout<<"Not available";

}

}

int main(){

fstream file;

int ch;

staff \*st;

st = new staff [50];

Librarystaff \*Lst;

Lst = new Librarystaff [50];

Student \*stu;

stu = new Student [50];

Teacher \*t;

t = new Teacher [50];

Book \*b;

b = new Book [50];

while(1){

cout << "For student press 1 \n";

cout << "For Teacher press 2 \n";

cout << "For staff press 3 \n";

cout << "For Library staff press 4. \n";

cout << "To add book press 5. \n";

cin>>ch;

switch(ch){

case 1:{

stu[0].Add();

stu[0].Show();

stu[0].Bookissue();

stu[0].Payfine();

file.open("student.dat",ios::out|ios::app|ios::binary);

file.write(reinterpret\_cast<char\*>(&stu[0]),sizeof(Student));

file.close();

break;

}

case 2 :{

t[0].Add();

t[0].Show();

t[0].Bookissue();

t[0].Payfine();

file.open("teacher.dat",ios::out|ios::app|ios::binary);

file.write(reinterpret\_cast<char\*>(&t[0]),sizeof(Teacher));

file.close();

break;

}

case 3:{

st[0].Add();

st[0].Show();

st[0].Bookissue();

st[0].Payfine();

file.open("staff.dat",ios::out|ios::app|ios::binary);

file.write(reinterpret\_cast<char\*>(&st[0]),sizeof(staff));

file.close();

break;

}

case 4:{

int g=0;

Lst[0].Add();

Lst[0].Show();

Lst[0].Bookissue();

Lst[0].Payfine();

file.open("Librarystaff.dat",ios::out|ios::app|ios::binary);

file.write(reinterpret\_cast<char\*>(&Lst[0]),sizeof(Librarystaff));

file.close();

cout<<"1 for search student bu last name ,first name and id";

cout<<"2 for search teacher bu last name ,first name and id"; break;

cout<<"3 for search staff bu last name ,first name and id";

cout<<"4 for search Library staff bu last name ,first name and id";

cin>>g;

if(g==1){

Sselname(stu);

Ssefname(stu);

SseId(stu);

}

else if(g==2){

Tsefname(t);

Tselname(t);

TseId(t);

}

else if(g==3){

Selname(st);

Sefname(st);

SeId(st);

}

else{

Lselname(Lst);

Lsefname(Lst);

LseId(Lst);

}

}

case 5:{

b[0].Add();

b[0].Show();

b[0].Bau();

b[0].Bid();

b[0].Bna();

file.open("books.dat",ios::out|ios::app|ios::binary);

file.write(reinterpret\_cast<char\*>(&b[0]),sizeof(Book));

file.close();

break;

}

}

}

}