Course: Object Oriented Programming with C++

(CET2010A) T5-SYBtech-2021-22

Mini Project Report

Topic: Library Management System

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Work Distribution:

Code for default constructor, copy constructor, accept and display functions was done by Yash Agarwal and Namira, then Mihir and Yash Honrao added file handling to the code.

INTRODUCTION

- **Problem Statement:** Develop an object oriented program in C++ for a library system which represents book information with following data members: author, title, price, and publisher. Member functions:

  1) Default Constructor.

  2) Copy Constructor.

  3) To Accept Book Information.

  4) To display Book Information.

- In this system, we have created 2 choices:

1. To add a new book which leads to-
   (i) Enter a new book- gives call to accept function.
   (ii) Add a default book- gives call to default constructor.
   (iii) Copy a book- gives call to search function which searches a book by same title then makes a copy of that book if it exists.

2. To display all books.

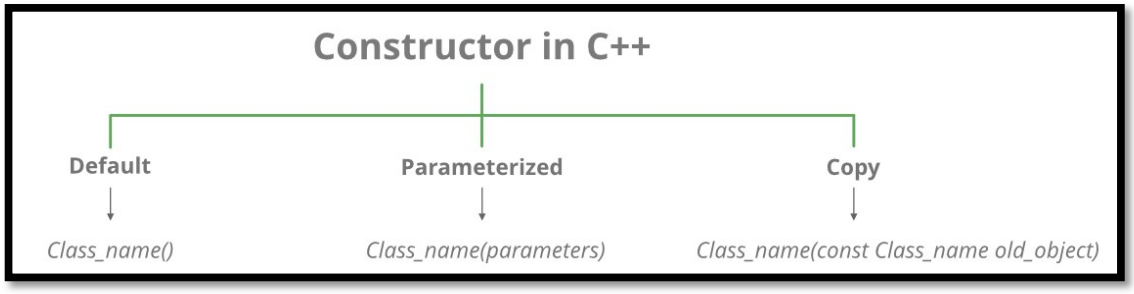
METHODOLOGY USED IN THE PROJECT

- **CLASS:** A class in C++ is the building block that leads to Object-Oriented programming. It is a user-defined data type, which holds its own data members and member functions, which can be accessed and used by creating an instance of that class. A C++ class is like a blueprint for an object.

- **OBJECTS:** In C++, Object is a real-world entity, for example, chair, car, pen, mobile, laptop etc. In other words, object is an entity that has state and behaviour. Here, state means data and behaviour means functionality. Object is a runtime entity; it is created at runtime.

- **FRIEND FUNCTION:** A friend class can access private and protected members of other class in which it is declared as friend. It is sometimes useful to allow a particular class to access private members of other class.

- **CONSTRUCTOR:** A constructor is a special type of member function of a class which initializes objects of a class. In C++, Constructor is automatically called when object (instance of class) creates. It is special member function of the class because it does not have any return type.



- **Default constructor:** Default constructor is the constructor which doesn't take any argument. It has no parameters.

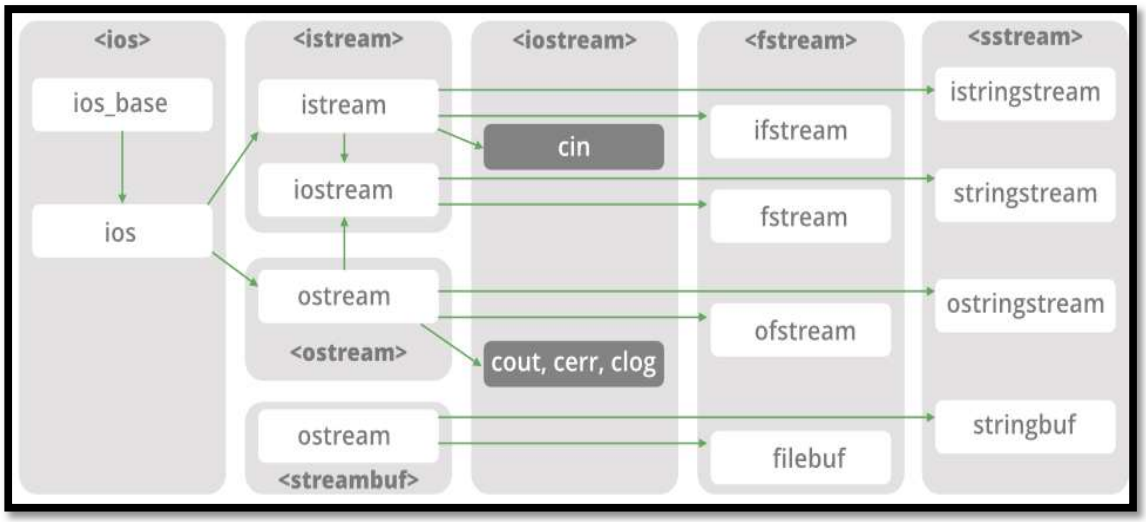
- **Parametrized constructor:** It is possible to pass arguments to constructors. Typically, these arguments help initialize an object when it is created. To create a parameterized constructor, simply add parameters to it the way you would to any other function. When you define the constructor's body, use the parameters to initialize the object.

- **Copy constructor:** A copy constructor is a member function which initializes an object using another object of the same class. Whenever we define one or more non-default constructors (with parameters) for a class, a default constructor (without parameters) should also be explicitly defined as the compiler will not provide a default constructor in this case. However, it is not necessary but it's considered to be the best practice to always define a default constructor.

- **Def:** The #define command is used to make substitutions throughout the file in which it is located. In other words, #define causes the compiler to go through the file, replacing every occurrence of *macro-name* with *replacement-string*. The replacement string stops at the end of the line.

- **File handling:** In C++, files are mainly dealt by using three classes fstream, ifstream, ofstream available in fstream header file.

  ofstream: Stream class to write on files
  ifstream: Stream class to read from files
  fstream: Stream class to both read and write from/to files.



CODE

```
#include<iostream>
#include<fstream>
#include<string.h>

using namespace std;

class Library{
    public:
    string title,author,publisher;
    int price;

        Library()
        {
            title = " ";
            author = " ";
            publisher = " ";
            price = 0;
        }

        Library(Library&b)
        {
            title = b.title;
            author = b.author;
            publisher = b.publisher;
            price = b.price;
        }

        void accept();
        void single_display();
        void display();
}l;

void Library::accept()
{
    cout<<"\nEnter Book Title: ";
    cin>>title;
    cout<<"\nEnter Book Author: ";
    cin>>author;
    cout<<"\nEnter Book Pubisher: ";
    cin>>publisher;
    cout<<"\nEnter Price of Book: ";
    cin>>price;
    cout<<endl;
```

```
}

void Library::single_display()
{
 cout<<endl;
 cout<<"Book Title   : "<<title<<endl;
 cout<<"Author Name  : "<<author<<endl;
 cout<<"Publisher    : "<<publisher<<endl;
 cout<<"Price of Book: "<<price<<endl;
}

void Library::display()
{
    cout<<"\n"<<title<<"\t\t"<<author<<"\t\t"<<publisher<<"\t\t\t"<<price;
}

Library search()
{
    int flag=0;
    string title;
    ifstream fin("book.dat");
    cout<<"\nEnter Book Title : ";
    cin>>title;
    while(fin.read((char*)&l,sizeof(l)))
    {
        if(title.compare(l.title)==0)
        {
            l.single_display();
            flag++;
            return l;
        }
    }
    fin.close();
    if(flag==0)
    cout<<"Book with Title: "<<title<<" not available...\n";
}


void addBook()
{
    int choice;
    cout<<"\n1.Enter a book";
    cout<<"\n2.Add a default book";
    cout<<"\n3.Copy a book";
    cout<<"\n\nEnter your choice: ";
```

```
    cin>>choice;
    ofstream fout;
    switch(choice)
    {
        case 1:
                fout.open("book.dat",ios::app);
                l.accept();
                fout.write((char*)&l,sizeof(l));
                cout<<"Book data saved in file...\n";
                fout.close();
                break;

        case 2:
                fout.open("book.dat",ios::app);
                l;
                fout.write((char*)&l,sizeof(l));
                cout<<"Book data saved in file...\n";
                fout.close();
                break;

        case 3:
                fout.open("book.dat",ios::app);
                l=search();
                fout.write((char*)&l,sizeof(l));
                cout<<"Book data saved in file...\n";
                fout.close();
                break;

        default: cout<<"Enter a valid choice.....";
    }
}

void displayAllBooks()
{
 ifstream fin("book.dat");
    cout<<endl<<endl;
    for (int i =0;i<100;i++)
        cout<<"_";
    cout<<"\nTITLE\t\tAuthor\t\tPublisher\t\tPrice\n";
    for (int i =0;i<100;i++)
        cout<<"=";
    cout<<endl;
    int rec=0;
    while(fin.read((char*)&l,sizeof(l)))
    {
```

```
        l.display();
        rec++;
    }
    fin.close();
    cout<<endl;
    cout<<"\nTotal "<<rec<<" Records in file...\n";
}

int main()
{
    int ch;
    do{
        cout<<"\n-----------LIBRARY MANAGEMENT SYSTEM----------";
        cout<<"\n1. Add New Book\n";
        cout<<"2. Display All Books\n";
        cout<<"3. EXIT.\n";
        cout<<"\nEnter you choice: ";
        cin>>ch;
        switch(ch)
        {
            case 1: addBook();
                    break;
            case 2: displayAllBooks();
                    break;
            case 3: cout<<"\nTHANKYOU!!!!!\n\n";
                    break;
            default: cout<<"Enter valid choice...";
        }
    }while(ch!=3);
    return 0;
}
```

OUTPUT

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\codes\c++\Basics\oops> cd "d:\codes\c++\Basics\oops\" ; if ($?) { g++ miniproject.cpp -o miniproject } ; if ($?) { .\miniproject }

----------LIBRARY MANAGEMENT SYSTEM----------
1. Add New Book
2. Display All Books
3. EXIT.

Enter you choice: 1

1.Enter a book
2.Add a default book
3.Copy a book

Enter your choice: 2
Book data saved in file...

----------LIBRARY MANAGEMENT SYSTEM----------
1. Add New Book
2. Display All Books
3. EXIT.

Enter you choice: 2


_____________________________________________________________________________________________
TITLE           Author          Publisher               Price
=============================================================================================

                                                        0

Total 1 Records in file...

----------LIBRARY MANAGEMENT SYSTEM----------
1. Add New Book
2. Display All Books
3. EXIT.

Enter you choice: 1

1.Enter a book
```

```
----------LIBRARY MANAGEMENT SYSTEM----------
1. Add New Book
2. Display All Books
3. EXIT.

Enter you choice: 1

1.Enter a book
2.Add a default book
3.Copy a book

Enter your choice: 1

Enter Book Title: sherlock

Enter Book Author: doyle

Enter Book Pubisher: newnes

Enter Price of Book: 499

Book data saved in file...

----------LIBRARY MANAGEMENT SYSTEM----------
1. Add New Book
2. Display All Books
3. EXIT.

Enter you choice: 2


_____________________________________________________________________________________________
TITLE           Author          Publisher               Price
=============================================================================================

                                                        0
sherlock                doyle           newnes                  499

Total 2 Records in file...
0 ⚠ 0
```

```
Total 2 Records in file...

-----------LIBRARY MANAGEMENT SYSTEM----------
1. Add New Book
2. Display All Books
3. EXIT.

Enter you choice: 1

1.Enter a book
2.Add a default book
3.Copy a book

Enter your choice: 3

Enter Book Title : sherlock

Book Title   : sherlock
Author Name  : doyle
Publisher    : newnes
Price of Book: 499
Book data saved in file...

-----------LIBRARY MANAGEMENT SYSTEM----------
1. Add New Book
2. Display All Books
3. EXIT.

Enter you choice: 2


_____________________________________________________________________________________________
TITLE           Author          Publisher               Price
=============================================================================================

                                                        0
sherlock                doyle           newnes                  499
sherlock                doyle           newnes                  499

Total 3 Records in file...

-----------LIBRARY MANAGEMENT SYSTEM----------
1. Add New Book
```

```
sherlock                doyle           newnes                  499

Total 3 Records in file...

-----------LIBRARY MANAGEMENT SYSTEM----------
1. Add New Book
2. Display All Books
3. EXIT.

Enter you choice: 3

THANKYOU!!!!!

PS D:\codes\c++\Basics\oops>
```