OOP Lab Assignment 1

Jaynam Modi. PG-43. G3. Jul 28, 2020

- Problem Statement: Develop an object oriented program in C++ to create a database of student information system containing the following information: Name, Roll number, Class, division, Date of Birth, Adhar number, Blood group, Contact address, telephone number. etc Construct the database with suitable member functions for initializing and destroying the data viz default constructor, Copy constructor, destructor. Also Display the student information.

- Objectives:

1. To learn concepts of classes and objects in C++
2. To learn constructor and destructor in C++

- Theory:

- Class : A class in C++ is a user-defined type or data structure declared with keyword class that has data and

functions (also called member variables and member functions) as its members whose access is governed by the three access specifiers private, protected or public.

- Object : Objects are instances of class, which holds the data variables declared in class and the member functions work on these class objects.

- Constructor and Destructor : Constructors are special class functions which performs initialization of every object. The Compiler calls the Constructor whenever an object is created. Constructors initialize values to object members after storage is allocated to the object. Whereas, Destructor on the other hand is used to destroy the class object.

- Algorithm:

1. Accept Value from User.
2. Store Values in Predefined Class.
3. Retrieve Values on User Demand.

4. Destroy Data.

- Platform: 64 - bit Open source Linux
- Input: Student Information : Name, Roll number, Class, division, Date of Birth, Adhar number, Blood group, Contact address, telephone number.
- Output: Student Database containing Name, Roll number, Class, division, Date of Birth, Adhar number, Blood group, Contact address, telephone number.
- Conclusion: Hence, learned to create classes, constructors and use of dynamic memory allocation in C++ successfully.
- FAQs:

1. Explain : Array of Objects

> The array of type class contains the objects of the class as its individual elements. Thus, an array of a class type is also known as an array of objects. An array of objects is declared in the same way as an array of any

built-in data type.

2. Explain the order of constructor and destructor execution in C++ with example?

> C++ constructor call order will be from top to down that is from base class to derived class and C++ destructor call order will be in reverse order.

For instance :

```
int main(){

    Student_b();

    Student_b stu;

    stu.~Student_b();

    return 0;

}
```

```cpp
#include <iostream>

using namespace std;


class Student_a{
        public:
        int rollno;
        string name;
        int student_class;
        char division;
        string dob;
        string aadhar;
        string blood_group;
        string contact_number;
        string address;
        string telephone_number;

        void getdata(){
                cout << "Enter the Following Details \n";
                cout << "       Roll Number : ";
                cin >> rollno;
                cout << "       Name : ";
                cin.ignore();
                getline(cin, name);
                cout << "       Class : ";
                cin >> student_class;
                cout << "       Division : ";
                cin >> division;
                cout << "       Date of Birth : ";
                cin.ignore();
                getline(cin, dob);
                cout << "       Aadhar Number : ";
                cin.ignore();
                getline(cin, aadhar);
                cout << "       Blood Group : ";
                cin.ignore();
                getline(cin, blood_group);
                cout << "       Contact Number : ";
                cin.ignore();
                getline(cin, contact_number);
                cout << "       Address : ";
                cin.ignore();
                getline(cin, address);
                cout << "       Telephone Number : ";
                cin.ignore();
                getline(cin, telephone_number);
        }

        void putdata(){
                        cout << "Entered Details are : " << endl;
                cout << "       Roll Number : " << rollno << endl;
                cout << "       Name : " << name << endl;
                cout << "       Class : " << student_class << endl;
                cout << "       Division : " << division << endl;
                cout << "       Date of Birth : " << dob << endl;
                cout << "       Aadhar Number : " << aadhar << endl;
                cout << "       Blood Group : " << blood_group << endl;
                cout << "       Contact Number : " << contact_number << endl;
                cout << "       Address : " << address << endl;
                cout << "       Telephone Number : " << telephone_number <<
endl;
        }
};

class Student_b{
        public:
        int rollno;
        string name;
        int student_class;
        char division;
        string dob;
        string aadhar;
        string blood_group;
        string contact_number;
        string address;
        string telephone_number;

        Student_b(){
                        cout << " > MADE WITH DEFAULT CONSTRUCTOR." << endl;
                cout << "Enter the Following Details \n";
                cout << "       Roll Number : ";
                cin >> rollno;
                cout << "       Name : ";
                cin.ignore();
                getline(cin, name);
                cout << "       Class : ";
                cin >> student_class;
                cout << "       Division : ";
                cin >> division;
                cout << "       Date of Birth : ";
                cin.ignore();
                getline(cin, dob);
                cout << "       Aadhar Number : ";
                cin.ignore();
                getline(cin, aadhar);
                cout << "       Blood Group : ";
                cin.ignore();
                getline(cin, blood_group);
                cout << "       Contact Number : ";
                cin.ignore();
                getline(cin, contact_number);
                cout << "       Address : ";
                cin.ignore();
                getline(cin, address);
                cout << "       Telephone Number : ";
                cin.ignore();
                getline(cin, telephone_number);
        }

        Student_b(int a, string b, int c, char d, string e, string f, string
g, string h, string i, string j){
                        cout << " > MADE WITH PARAMETERIZED CONSTRUCTOR" <<
endl;
                        rollno = a;
                        name = b;
                        student_class = c;
                        division = d;
                        dob = e;
                        aadhar = f;
                        blood_group = g;
                        contact_number = h;
                        address = i;
                        telephone_number = j;
        }

        Student_b(Student_b &p){
                                cout << " > MADE WITH COPY CONSTRUCTOR" <<
endl;
                        rollno = p.rollno;
                        name = p.name;
                        student_class = p.student_class;
                        division = p.division;
                        dob = p.dob;
                        aadhar = p.aadhar;
                        blood_group = p.blood_group;
                        contact_number = p.contact_number;
                        address = p.address;
                        telephone_number = p.telephone_number;
        }

        void putdata(){
                        cout << "Entered Details are : " << endl;
                cout << "       Roll Number : " << rollno << endl;
                cout << "       Name : " << name << endl;
                cout << "       Class : " << student_class << endl;
                cout << "       Division : " << division << endl;
                cout << "       Date of Birth : " << dob << endl;
                cout << "       Aadhar Number : " << aadhar << endl;
                cout << "       Blood Group : " << blood_group << endl;
                cout << "       Contact Number : " << contact_number << endl;
                cout << "       Address : " << address << endl;
                cout << "       Telephone Number : " << telephone_number <<
endl;
        }
};



int main(){

    // Q 1.a Develop an Object Oriented Program in C++ to.....

        Student_a a1;
          a1.getdata();
        a1.putdata();

 // Q 1.b Modify the Program in Q 1.a to......

        Student_b b1;
        Student_b b2(43, "Jaynam Modi", 9, 'C', "01/01/2001", "759362842648",
"B+", "7493749274", "Kothrud, Pune", "749282");
        Student_b b3(b2);
}
```

```
u0_a362@localhost:~$ ./a.out
 > MADE WITH DEFAULT CONSTRUCTOR.
Enter the Following Details
        Roll Number : 43
        Name : Jaynam Modi
        Class : 10
        Division : C
        Date of Birth : 01/01/2001
        Aadhar Number : 739384927493
        Blood Group : B+
        Contact Number : 9746283744
        Address : Kothrud, Pune, India.
        Telephone Number : (0220)748373
MADE WITH PARAMETERIZED CONSTRUCTOR
MADE WITH COPY CONSTRUCTOR
u0_a362@localhost:~$
```