

# OOP Lab Assignment 1

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- 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;  
}
```



```

1 #include <iostream>
2
3 using namespace std;
4
5
6 class Student_a{
7     public:
8     int rollno;
9     string name;
10    int student_class;
11    char division;
12    string dob;
13    string aadhar;
14    string blood_group;
15    string contact_number;
16    string address;
17    string telephone_number;
18
19    void getdata(){
20        cout << "Enter the Following Details \n";
21        cout << "        Roll Number : ";
22        cin >> rollno;
23        cout << "        Name : ";
24        cin.ignore();
25        getline(cin, name);
26        cout << "        Class : ";
27        cin >> student_class;
28        cout << "        Division : ";
29        cin >> division;
30        cout << "        Date of Birth : ";
31        cin.ignore();
32        getline(cin, dob);
33        cout << "        Aadhar Number : ";
34        cin.ignore();
35        getline(cin, aadhar);
36        cout << "        Blood Group : ";
37        cin.ignore();
38        getline(cin, blood_group);
39        cout << "        Contact Number : ";
40        cin.ignore();
41        getline(cin, contact_number);
42        cout << "        Address : ";
43        cin.ignore();
44        getline(cin, address);
45        cout << "        Telephone Number : ";
46        cin.ignore();
47        getline(cin, telephone_number);
48    }
49
50    void putdata(){
51        cout << "Entered Details are : " << endl;
52        cout << "        Roll Number : " << rollno << endl;
53        cout << "        Name : " << name << endl;
54        cout << "        Class : " << student_class << endl;
55        cout << "        Division : " << division << endl;
56        cout << "        Date of Birth : " << dob << endl;
57        cout << "        Aadhar Number : " << aadhar << endl;
58        cout << "        Blood Group : " << blood_group << endl;
59        cout << "        Contact Number : " << contact_number << endl;
60        cout << "        Address : " << address << endl;
61        cout << "        Telephone Number : " << telephone_number <<
endl;
62    }
63 };
64
65 class Student_b{
66     public:
67     int rollno;
68     string name;
69     int student_class;
70     char division;
71     string dob;
72     string aadhar;
73     string blood_group;
74     string contact_number;
75     string address;
76     string telephone_number;
77
78     Student_b(){
79         cout << " > MADE WITH DEFAULT CONSTRUCTOR." << endl;
80         cout << "Enter the Following Details \n";
81         cout << "        Roll Number : ";
82         cin >> rollno;
83         cout << "        Name : ";
84         cin.ignore();
85         getline(cin, name);
86         cout << "        Class : ";
87         cin >> student_class;
88         cout << "        Division : ";
89         cin >> division;
90         cout << "        Date of Birth : ";
91         cin.ignore();
92         getline(cin, dob);
93         cout << "        Aadhar Number : ";
94         cin.ignore();
95         getline(cin, aadhar);
96         cout << "        Blood Group : ";
97         cin.ignore();
98         getline(cin, blood_group);
99         cout << "        Contact Number : ";
100        cin.ignore();
101        getline(cin, contact_number);
102        cout << "        Address : ";
103        cin.ignore();
104        getline(cin, address);
105        cout << "        Telephone Number : ";
106        cin.ignore();
107        getline(cin, telephone_number);
108    }
109
110    Student_b(int a, string b, int c, char d, string e, string f, string
g, string h, string i, string j){
111        cout << " > MADE WITH PARAMETERIZED CONSTRUCTOR" <<
endl;
112        rollno = a;
113        name = b;
114        student_class = c;
115        division = d;
116        dob = e;
117        aadhar = f;
118        blood_group = g;
119        contact_number = h;
120        address = i;
121        telephone_number = j;
122    }
123
124    Student_b(Student_b &p){
125        cout << " > MADE WITH COPY CONSTRUCTOR" <<
endl;
126        rollno = p.rollno;
127        name = p.name;
128        student_class = p.student_class;
129        division = p.division;
130        dob = p.dob;
131        aadhar = p.aadhar;
132        blood_group = p.blood_group;
133        contact_number = p.contact_number;
134        address = p.address;
135        telephone_number = p.telephone_number;
136    }
137
138    void putdata(){
139        cout << "Entered Details are : " << endl;
140        cout << "        Roll Number : " << rollno << endl;
141        cout << "        Name : " << name << endl;
142        cout << "        Class : " << student_class << endl;
143        cout << "        Division : " << division << endl;
144        cout << "        Date of Birth : " << dob << endl;
145        cout << "        Aadhar Number : " << aadhar << endl;
146        cout << "        Blood Group : " << blood_group << endl;
147        cout << "        Contact Number : " << contact_number << endl;
148        cout << "        Address : " << address << endl;
149        cout << "        Telephone Number : " << telephone_number <<
endl;
150    }
151 };
152
153
154
155 int main(){
156
157     // Q 1.a Develop an Object Oriented Program in C++ to.....
158
159     Student_a a1;
160     a1.getdata();
161     a1.putdata();
162
163     // Q 1.b Modify the Program in Q 1.a to.....
164
165     Student_b b1;
166     Student_b b2(43, "Jaynam Modi", 9, 'C', "01/01/2001", "759362842648",
"B+", "7493749274", "Kothrud, Pune", "749282");
167     Student_b b3(b2);
168 }

```



```
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:~$
```