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**Subject: Object Oriented Programming in C++**

**Lab-8**

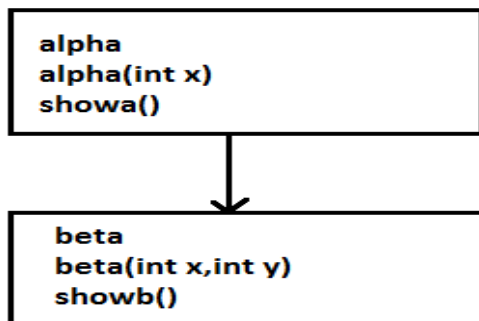**Title: Constructor in Inheritance**

**Objective**:
- To be familiar with use of constructor in inheritance
- To understand about working mechanism of constructor and destructor in inheritance
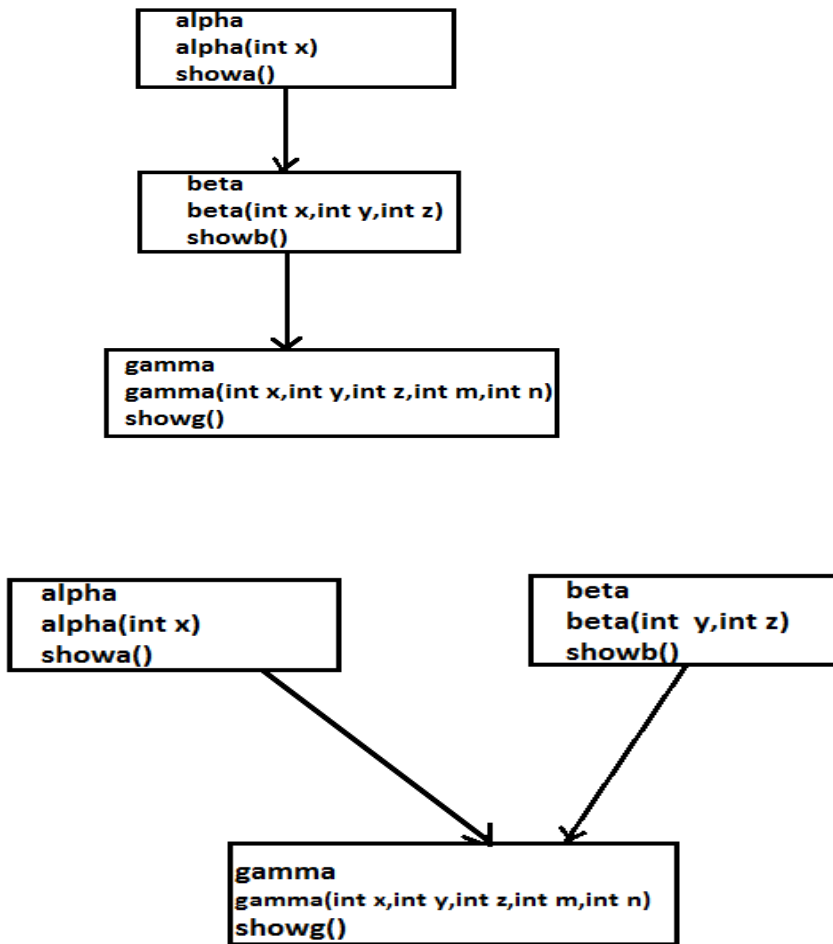
**Theory:**
- Constructor and destructor in inheritance
- Argument passing mechanism for supplying initial values to the bases classes constructors
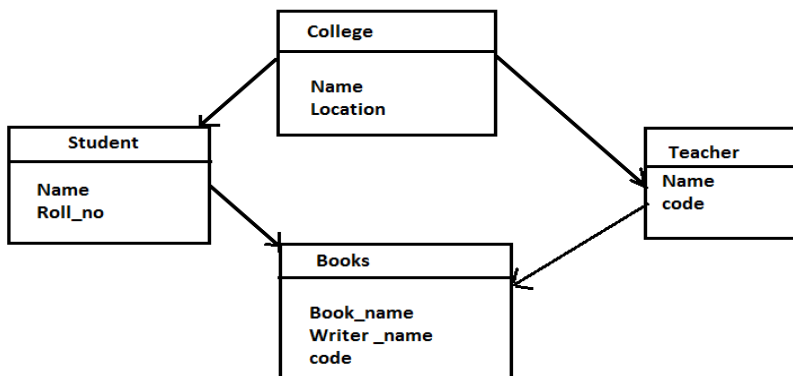
**Lab exercises (please code yourself and show the output to instructor)**

1. **Write a complete program with reference to given below.**

```
alpha
alpha(int x)
showa()
```
↓
```
beta
beta(int x,int y)
showb()
```

```
┌─────────────────────┐
│ alpha               │
│ alpha(int x)        │
│ showa()             │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐
│ beta                │
│ beta(int x,int y,int z) │
│ showb()             │
└─────────────────────┘
          │
          ▼
┌──────────────────────────────┐
│ gamma                        │
│ gamma(int x,int y,int z,int m,int n) │
│ showg()                      │
└──────────────────────────────┘
```

```
┌─────────────────────┐          ┌─────────────────────┐
│ alpha               │          │ beta                │
│ alpha(int x)        │          │ beta(int  y,int z)  │
│ showa()             │          │ showb()             │
└─────────────────────┘          └─────────────────────┘
            \                        /
             \                      /
              ▼                    ▼
       ┌──────────────────────────────┐
       │ gamma                        │
       │ gamma(int x,int y,int z,int m,int n) │
       │ showg()                      │
       └──────────────────────────────┘
```

**2.** The following figure shows the minimum information required for each class. Write a program to realize the above program with necessary member functions to create the database and retrieve individual information .Every class should contain at least one constructor and should be inherited to other classes as well.

```
                    ┌──────────────────┐
                    │ College          │
                    ├──────────────────┤
                    │ Name             │
                    │ Location         │
                    └──────────────────┘
                     /              \
                    ▼                \
┌──────────────────┐                  \
│ Student          │                   ▼
├──────────────────┤              ┌──────────────────┐
│ Name             │              │ Teacher          │
│ Roll_no          │              ├──────────────────┤
└──────────────────┘              │ Name             │
            \                     │ code             │
             ▼                    └──────────────────┘
       ┌──────────────────┐        ▲
       │ Books            │       /
       ├──────────────────┤      /
       │ Book_name        │     /
       │ Writer _name     │
       │ code             │
       └──────────────────┘
```

3. Create a class person with data members name, age and address. Create another class teacher with data members Qualification and department .Also create another class Student with data members program and semester. Both class are inherited from class person. Every class has at least one constructor which uses base class constructor. Create member function showdata() in each to display the information of the class member.