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FACULTY OF ENGINEERING & TECHNOLOGY

CSPS103: Object Oriented Programming

Lecture-20

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OBJECTIVES

In this lecture, you will learn to:

❖ **Single Inheritance**

❖ **Program**

❖ **Ambiguity in single Inheritance**

❖ **Single Level Inheritance Example: Inheriting Fields**



SINGLE INHERITANCE

- ❑ The process in which a derived class inherits traits from only one base class, is called single inheritance.
- ❑ In single inheritance, there is only one base class and one derived class.
- ❑ The derived class inherits the behavior and attributes of the base class.
- ❑ The derived class can add its own properties i.e. data members (variables) and functions.
- ❑ It can extend or use properties of the base class without any modification to the base class.
- ❑ We declare the base class and derived class as given below:

```
class base_class
```

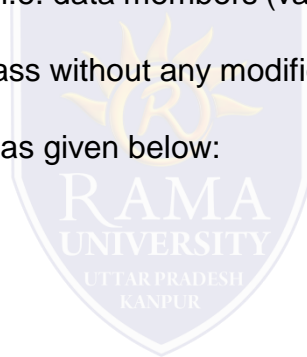
```
{
```

```
};
```

```
class derived_class : visibility-mode base_class
```

```
{
```

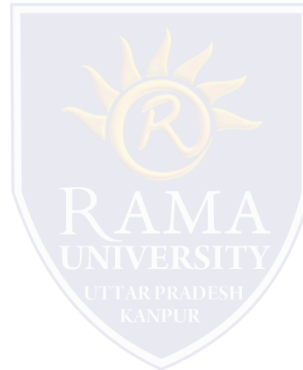
```
};
```



PROGRAM

Program to illustrate concept of single inheritance

```
#include<iostream.h>
#include<conio.h>
class base //base class
{
int x,y;
public:
void show() {
cout<<"In base class";
}
};
class derived : public base //derived class
{
int a,b;
public:
void show2() {
cout<<"\nIn derived class";
}
};
int main() {
derived d;
d.show(); //uses base class's show() function
d.show2(); //uses derived class's show2() function
getch();
return 0;
}
```



AMBIGUITY IN SINGLE INHERITANCE

❑ Whenever a data member and member functions are defined with the same name in both the base and derived class, ambiguity occurs.

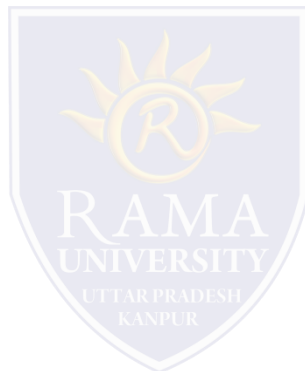
❑ The scope resolution operator must be used to refer to particular class as:

object name.class name :: class member



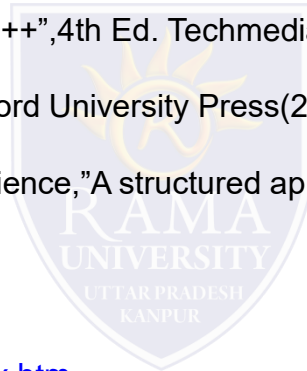
SINGLE LEVEL INHERITANCE EXAMPLE: INHERITING FIELDS

```
#include <iostream.h>
class Account {
    public:
    float salary = 60000;
};
class Programmer: public Account {
    public:
    float bonus = 5000;
};
int main(void) {
    Programmer p1;
    cout<<"Salary: "<<p1.salary<<endl;
    cout<<"Bonus: "<<p1.bonus<<endl;
    return 0;
}
```



REFERENCES

- Kernighan, Brian W., and Dennis M. Richie. The C Programming Language. Vol. 2. Englewood Cliffs: Prentice-Hall, 1988.
- King, Kim N., and Kim King. C programming: A Modern Approach. Norton, 1996.
- Bjarne Stroustrup, "C++ Programming language", 3rd edition, Pearson education Asia (1997)
- Lafore R. "Object oriented Programming in C++", 4th Ed. Techmedia, New Delhi (2002).
- Yashwant Kenetkar, "Let us C++", 1st Ed., Oxford University Press (2006)
- B.A. Forouzan and R.F. Gilberg, Compiler Science, "A structured approach using C++" Cengage Learning, New Delhi.
- <https://www.javatpoint.com/cpp-tutorial>
- <https://www.tutorialspoint.com/cplusplus/index.htm>
- [https://ambedkarcollegevasai.com/wp-content/uploads/2019/03/ CPP.pdf](https://ambedkarcollegevasai.com/wp-content/uploads/2019/03/_CPP.pdf)
- https://onlinecourses.nptel.ac.in/noc20_cs07/unit?unit=3&lesson=19



MULTIPLE CHOICE QUESTION

Multiple Choice Question:

Q1. Members which are not intended to be inherited are declared as _____

- a) Public members
- b) Protected members
- c) Private members
- d) Private or Protected members



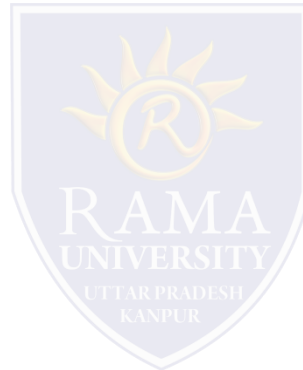
MULTIPLE CHOICE QUESTION

Multiple Choice Question:

Q2. While inheriting a class, if no access mode is specified, then which among the following is true? (in

C++)

- a) It gets inherited publicly by default
- b) It gets inherited protected by default
- c) It gets inherited privately by default
- d) It is not possible



MULTIPLE CHOICE QUESTION

Multiple Choice Question:

Q3. If a derived class object is created, which constructor is called first?

- a) Base class constructor
- b) Derived class constructor
- c) Depends on how we call the object
- d) Not possible

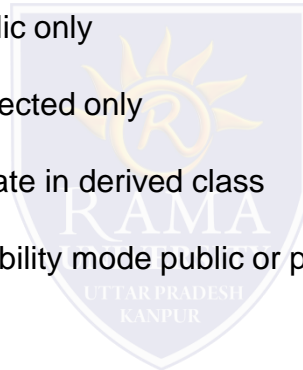


MULTIPLE CHOICE QUESTION

Multiple Choice Question:

Q4. How can you make the private members inheritable?

- a) By making their visibility mode as public only
- b) By making their visibility mode as protected only
- c) By making their visibility mode as private in derived class
- d) It can be done both by making the visibility mode public or protected



MULTIPLE CHOICE QUESTION

Multiple Choice Question:

Q5. How many types of inheritance are possible in C++?

- a) 2
- b) 3
- c) 4
- d) 5



Summary

In this lecture, you learned that:

- When one class inherits another class, it is known as single level inheritance

