



FACULTY OF ENGINEERING & TECHNOLOGY

CSPS103: Object Oriented Programming

Lecture-15

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OBJECTIVES

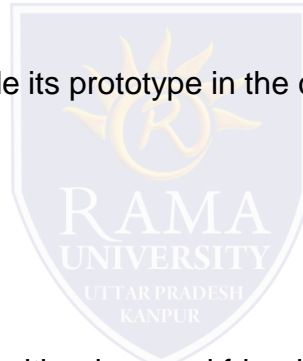
In this lecture, you will learn to:

- ❖ Friend function
- ❖ Declaration of friend function in C++
- ❖ Characteristics of a Friend function
- ❖ Examples



FRIEND FUNCTION

- ❑ In general, only other members of a class have access to the private members of the class.
- ❑ However, it is possible to allow a nonmember function access to the private members of a class by declaring it as a friend of the class.
- ❑ To make a function a friend of a class, you include its prototype in the class declaration and precede it with the friend keyword.
- ❑ The function is declared with friend keyword.
- ❑ But while defining friend function, it does not use either keyword friend or :: operator.
- ❑ A function can be a friend of more than one class.
- ❑ Member function of one class can be friend functions of another class.
- ❑ In such cases they are defined using the scope resolution operator.



DECLARATION OF FRIEND FUNCTION IN C++

```
class class_name  
{  
    friend data_type function_name(argument/s); // syntax of friend function.  
};
```



CHARACTERISTICS OF A FRIEND FUNCTION

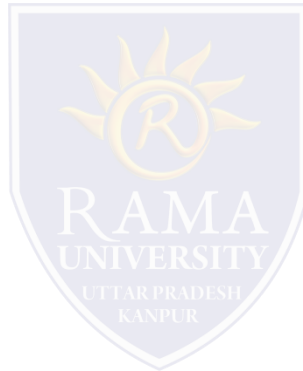
- ☐ It is not in the scope of the class to which it has been declared as friend.
- ☐ A friend function cannot be called using the object of that class. It can be invoked like a normal function without help of any object.
- ☐ It cannot access the member variables directly & has to use an object name dot membership operator with member name.
- ☐ It can be declared either in the public or the private part of a class without affecting its meaning.
- ☐ Usually, it has the object as arguments.



EXAMPLE FRIEND FUNCTION

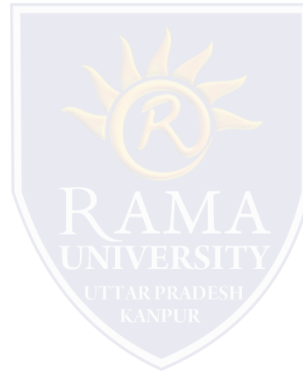
Program to illustrate use of friend function

```
#include<iostream.h>
#include<conio.h>
class A{
    int x, y;
public:
    friend void display(A &obj);
    void getdata() {
        cin>>x>>y;
    }
};
void display(A &obj){
    cout<<obj.x<<obj.y;
}
int main(){
    A a;
    a.getdata();
    display(a);
    getch();
    return 0;
}
```



EXAMPLE WHEN THE FUNCTION IS FRIENDLY TO TWO CLASSES

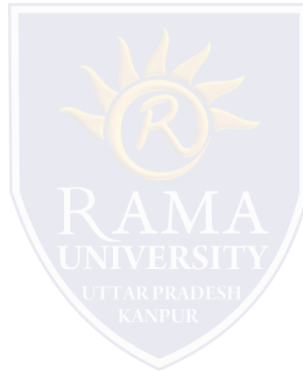
```
#include <iostream.h>
class B;      // forward declaration.
class A
{
    int x;
    public:
    void setdata(int i)
    {
        x=i;
    }
    friend void min(A,B);    // friend function.
};
class B
{
    int y;
    public:
    void setdata(int i)
    {
        y=i;
    }
    friend void min(A,B);    // friend function
};
```



EXAMPLE WHEN THE FUNCTION IS FRIENDLY TO TWO CLASSES (Contd.)

```
void min(A a,B b)
{
    if(a.x<=b.y)
        std::cout << a.x << std::endl;
    else
        std::cout << b.y << std::endl;
}

int main()
{
    A a;
    B b;
    a.setdata(10);
    b.setdata(20);
    min(a,b);
    return 0;
}
```



REFERENCES

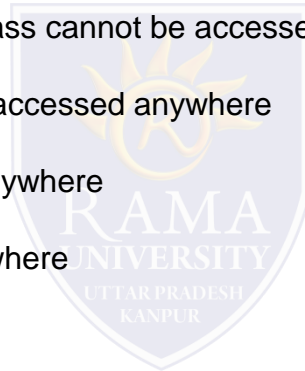
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MULTIPLE CHOICE QUESTION

Multiple Choice Question:

Q1. Which rule will not affect the friend function?

- a) private and protected members of a class cannot be accessed from outside
- b) private and protected member can be accessed anywhere
- c) protected member can be accessed anywhere
- d) private member can be accessed anywhere

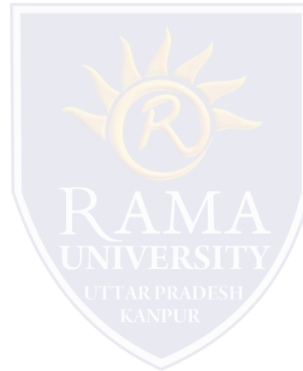


MULTIPLE CHOICE QUESTION

Multiple Choice Question:

Q2. Which keyword is used to declare the friend function?

- a) firend
- b) friend
- c) classfriend
- d) myfriend

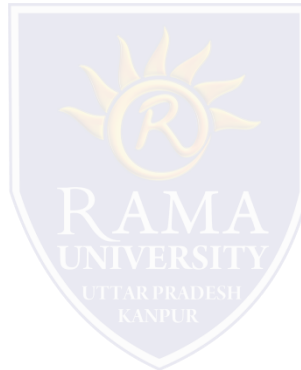


MULTIPLE CHOICE QUESTION

Multiple Choice Question:

Q3. What is the syntax of friend function?

- a) friend class1 Class2;
- b) friend class;
- c) friend class
- d) friend class()

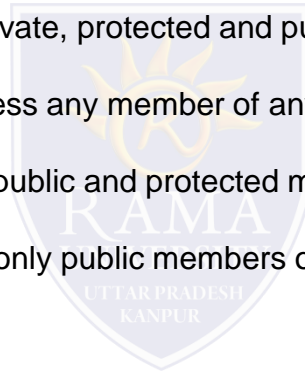


MULTIPLE CHOICE QUESTION

Multiple Choice Question:

Q4. What is a friend function in C++?

- a) A function which can access all the private, protected and public members of a class
- b) A function which is not allowed to access any member of any class
- c) A function which is allowed to access public and protected members of a class
- d) A function which is allowed to access only public members of a class

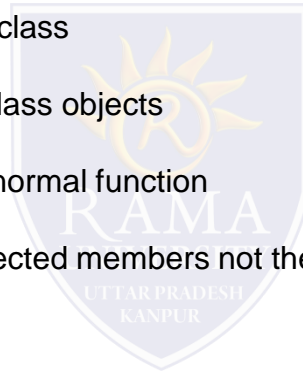


MULTIPLE CHOICE QUESTION

Multiple Choice Question:

Q5. Pick the correct statement.

- a) Friend functions are in the scope of a class
- b) Friend functions can be called using class objects
- c) Friend functions can be invoked as a normal function
- d) Friend functions can access only protected members not the private members



In this lecture, you learned that:

- If a function is defined as a friend function in C++, then the protected and private data of a class can be accessed using the function.
- By using the keyword friend compiler knows the given function is a friend function.

