# INHERITANCE

Inheritance is a mechanism of acquiring the features and behaviors of a class by another class. The class whose members are inherited is called the base class, and the class that inherits those members is called the derived class.

**Advantages:**

- Reduce code redundancy.
- Provides code reusability.
- Code is easy to manage and divided into parent and child classes.
- Reduces source code size and improves code readability.

```
#include <iostream>
using namespace std;
// Base class
class Shape  {
   public:
      void setWidth(int w) {
         width = w;
      }
      void setHeight(int h) {
         height = h;
      }
   protected:
      int width;
      int height;
};
// Derived class
class Rectangle: public Shape {
   public:
      void getArea() {
         cout<<width * height;
      }
};
```

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```
int main() {
   Rectangle Rect;
                Rect.setWidth(5);
                Rect.setHeight(7);

   // Print the area of the object.
   Rect.getArea()<<endl;

   return 0;
}
```

## Mode of Inheritance

- **Public Inheritance:** When deriving a class from a **public** base class, **public** members of the base class become **public** members of the derived class and **protected** members of the base class become **protected** members of the derived class. A base class's **private** members are never accessible directly from a derived class, but can be accessed through calls to the **public** and **protected** members of the base class.

- **Protected Inheritance:** When deriving from a **protected** base class, **public** and **protected** members of the base class become **protected** members of the derived class.

- **Private Inheritance:** When deriving from a **private** base class, **public** and **protected** members of the base class become **private** members of the derived class.

| Mode of Inheritance | Base class | Derived class |
|---|---|---|
| Private | Private | Not Accessible |
| | Protected | Private |

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| | Public | Private |
|---|---|---|
| Protected | Private | Not Accessible |
| | Protected | Protected |
| | Public | Protected |
| Public | Private | Not Accessible |
| | Protected | Protected |
| | Public | Public |

Syntax:

Class Base class name

{

Body of the Base class

};

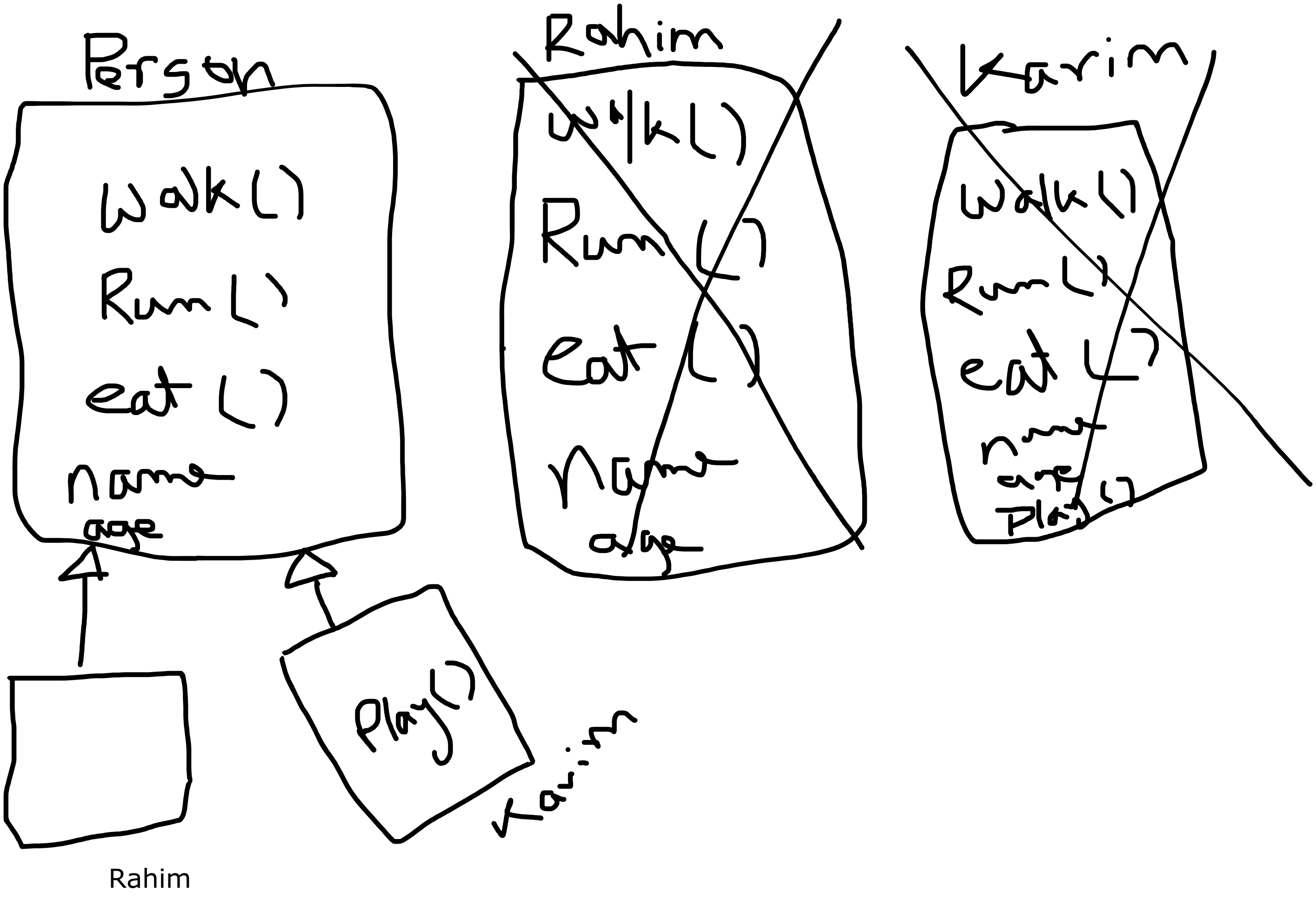
class Derived class name**: Access specifier** Base class name

{

Body of the Derived class;

};

# INHERITANCE


Person
walk()
Run()
eat()
name
age
Play()
Karim
Rahim
Rahim
walk()
Run()
eat()
name
age
Karim
walk()
Run()
eat()
name
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