What are the types of inheritance?

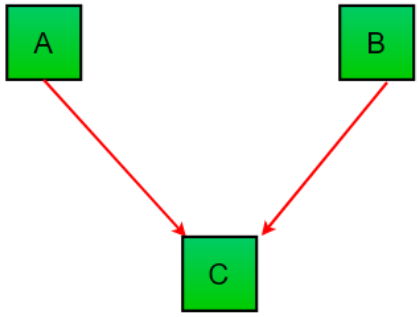
- **Single inheritance:** inherit properties from a single parent class, thus enabling code reusability and the addition of new features to existing code.

```
class Parent:
    def func1(self):
        print("This function is in parent class.")

# Derived class


class Child(Parent):
    def func2(self):
        print("This function is in child class.")


# Driver's code
object = Child()
object.func1()
object.func2()
```

Output:

```
This function is in parent class.
This function is in child class.
```

- **Multiple inheritance:** When a class can be derived from more than one base class this type of inheritance is called multiple inheritances. In multiple inheritances, all the features of the base classes are inherited into the derived class.



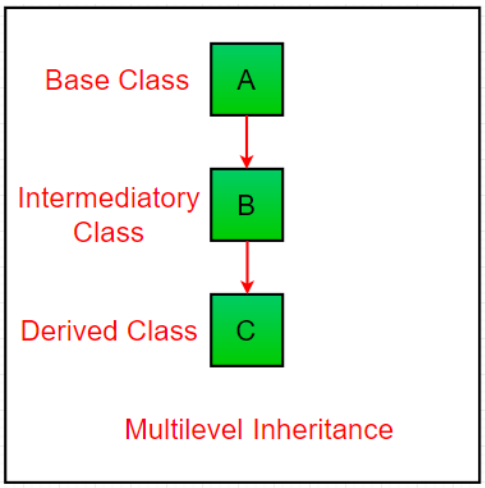
Multiple Inheritance

```
class Mother:
    mothername = ""

    def mother(self):
        print(self.mothername)

# Base class2


class Father:
    fathername = ""

    def father(self):
        print(self.fathername)

# Derived class


class Son(Mother, Father):
    def parents(self):
        print("Father :", self.fathername)
        print("Mother :", self.mothername)


# Driver's code
s1 = Son()
s1.fathername = "RAM"
s1.mothername = "SITA"
s1.parents()
```

Output:

```
Father : RAM
Mother : SITA
```

- **Multilevel inheritance:** In multilevel inheritance, features of the base class and the derived class are further inherited into the new derived class. This is similar to a relationship representing a child and a grandfather.

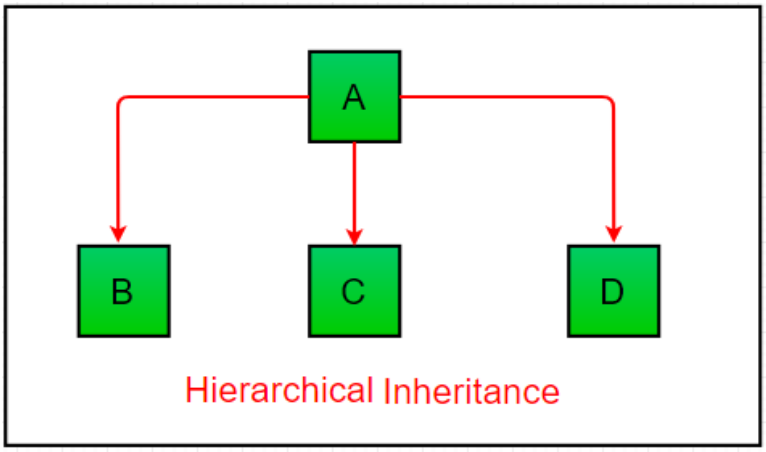



```
class Grandfather:

    def __init__(self, grandfathername):
        self.grandfathername = grandfathername

# Intermediate class


class Father(Grandfather):
    def __init__(self, fathername, grandfathername):
        self.fathername = fathername

        # invoking constructor of Grandfather class
        Grandfather.__init__(self, grandfathername)

# Derived class


class Son(Father):
    def __init__(self, sonname, fathername, grandfathername):
        self.sonname = sonname

        # invoking constructor of Father class
        Father.__init__(self, fathername, grandfathername)

    def print_name(self):
        print('Grandfather name :', self.grandfathername)
        print("Father name :", self.fathername)
        print("Son name :", self.sonname)


#  Driver code
s1 = Son('Prince', 'Rampal', 'Lal mani')
print(s1.grandfathername)
s1.print_name()
```

Output:

```
Lal mani
Grandfather name : Lal mani
Father name : Rampal
Son name : Prince
```

- **Hierarchical inheritance:** When more than one derived class are created from a single base this type of inheritance is called hierarchical inheritance. In this program, we have a parent (base) class and two child (derived) classes.

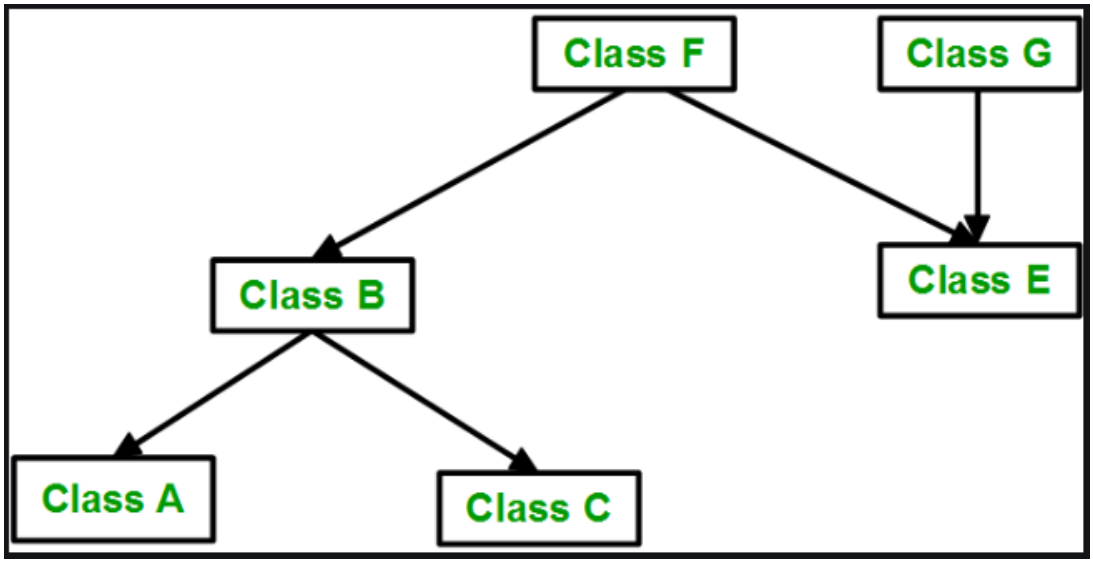



```
class Parent:
    def func1(self):
        print("This function is in parent class.")

# Derived class1


class Child1(Parent):
    def func2(self):
        print("This function is in child 1.")

# Derivied class2


class Child2(Parent):
    def func3(self):
        print("This function is in child 2.")


# Driver's code
object1 = Child1()
object2 = Child2()
object1.func1()
object1.func2()
object2.func1()
object2.func3()
```

Output:

```
This function is in parent class.
This function is in child 1.
This function is in parent class.
This function is in child 2.
```

- **Hybrid inheritance:** Inheritance consisting of multiple types of inheritance is called hybrid inheritance.




```
class School:
    def func1(self):
        print("This function is in school.")


class Student1(School):
    def func2(self):
        print("This function is in student 1. ")


class Student2(School):
    def func3(self):
        print("This function is in student 2.")


class Student3(Student1, School):
    def func4(self):
        print("This function is in student 3.")


# Driver's code
object = Student3()
object.func1()
object.func2()
```

Output:

```
This function is in school.
This function is in student 1.
```