AI LAB WEEK 3

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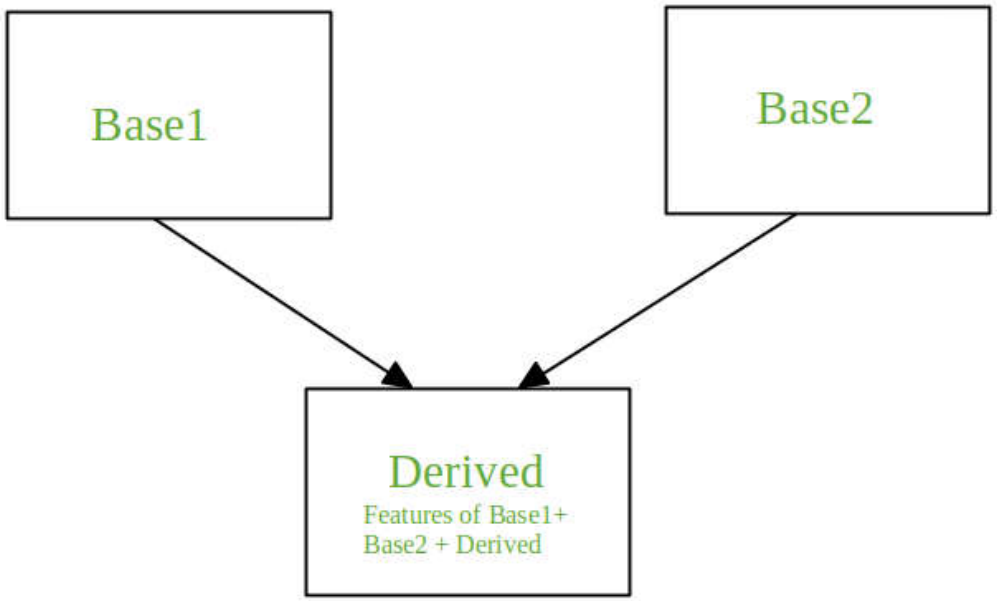
MULTIPLE INHERITANCE IN PYTHON

Inheritance is the mechanism to achieve the re-usability of code as one class(child class) can derive the properties of another class(parent class). It also provides transitivity ie. if class C inherits from P then all the sub-classes of C would also inherit from P.

When a class is derived from more than one base class it is called multiple Inheritance. The derived class inherits all the features of the base case.

MULTIPLE INHERITANCE IN PYTHON



MULTIPLE INHERITANCE IN PYTHON

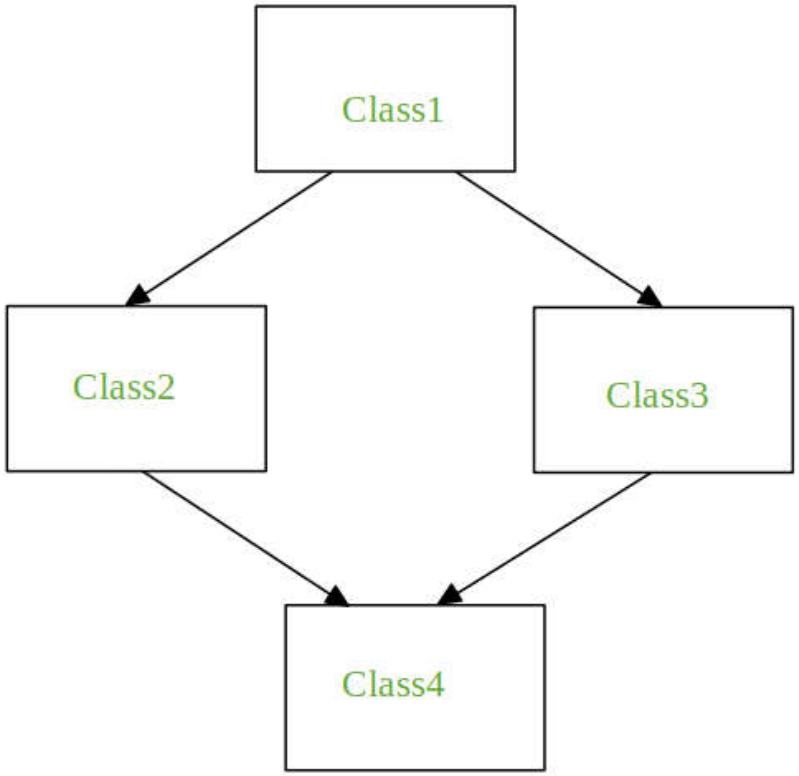
Syntax:

```
Class Base1:
       Body of the class

Class Base2:
     Body of the class

Class Derived(Base1, Base2):
     Body of the class
```

THE DIAMOND PROBLEM



THE DIAMOND PROBLEM

It refers to an ambiguity that arises when two classes Class2 and Class3 inherit from a superclass Class1 and class Class4 inherits from both Class2 and Class3. If there is a method “m” which is an overridden method in one of Class2 and Class3 or both then the ambiguity arises which of the method “m” Class4 should inherit.

```
# Python Program to depict multiple inheritance
# when method is overridden in both classes

class Class1:
    def m(self):
        print("In Class1")

class Class2(Class1):
    def m(self):
        print("In Class2")

class Class3(Class1):
    def m(self):
        print("In Class3")

class Class4(Class2, Class3):
    pass

obj = Class4()
obj.m()
```

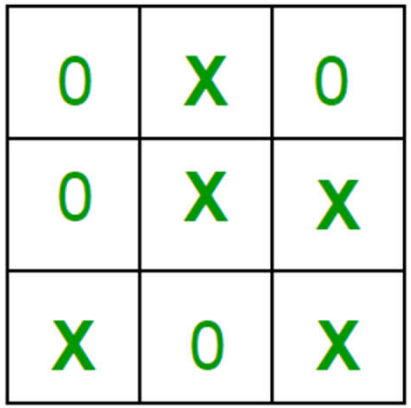
RULES OF THE GAME

The game is to be played between two people (in this program between HUMAN and COMPUTER).

One of the player chooses ‘O’ and the other ‘X’ to mark their respective cells.

The game starts with one of the players and the game ends when one of the players has one whole row/ column/ diagonal filled with his/her respective character (‘O’ or ‘X’).

If no one wins, then the game is said to be draw.



RULES OF THE GAME

Implementation In our program the moves taken by the computer and the human are chosen randomly. We use rand() function for this.

The program is in not played optimally by both sides because the moves are chosen randomly. The program can be easily modified so that both players play optimally (which will fall under the category of Artificial Intelligence). Also the program can be modified such that the user himself gives the input (using input command). The above changes are left as an exercise to the readers.

Winning Strategy – An Interesting Fact If both the players play optimally then it is destined that you will never lose ("although the match can still be drawn"). It doesn't matter whether you play first or second.In another ways – " Two expert players will always draw "