Instance Vs Class Variables in python

In python, variable can be defined at the class level or at the instance level. Understanding the difference between these types of variables is crucial for writing efficient and maintainable code.

Class Variables

Class variable are defined at the class level and are shared among all instances of the class. They are defined outside of any method and are usually used to store information that is common to all instances of the class. For Example, a class variable can be used to store the number of instances of a class that have been created.

```
class Programmer:
    companyName="Google"
    def __init__(self,name):
        self.name=name
        self.amount=0.02

    def ShowDetails(self):
        print(f"The name of Programmer is {self.name} and the amount is
{self.amount} and Company Name is {self.companyName}")


p=Programmer("Munawar")
p.ShowDetails()
# Programmer.ShowDetails(p)

p1=Programmer("Kamal")
p1.amount=5.0
p1.ShowDetails()
```

Instance Variables

Instance variables are defined at the instance level and are unique to each instance of the class. They are defined inside the init method and usually used to store information that is specific to each instance if the class. For example, an instance variable can be used to store the name of a programmer in a class that represents an programmer.

```
class Myclass:
    class_variable=0
    def __init__(self):
        Myclass.class_variable+=1

    def printClass(self):
        print(Myclass.class_variable)


obj=Myclass()
obj2=Myclass()
obj.printClass()  #output 2
obj2.printClass() #output 2
```

Source Code

```
class Programmer:
    companyName="Google"
    noofProgrammer=0
    def __init__(self,name):
    # name and amount is instance variable
        self.name=name
        self.amount=0.02
        Programmer.noofProgrammer+=1

    def ShowDetails(self):
        print(f"The name of Programmer is {self.name} and the amount is
{self.amount} and Company Name is {self.companyName} Number of Programmers are
{self.noofProgrammer}")


p=Programmer("Munawar")
p.ShowDetails()
# Programmer.ShowDetails(p)


p1=Programmer("Kamal")
p1.companyName="Apple"
p1.amount=5.0
p1.ShowDetails()
```

```
print(Programmer.companyName)
print(p1.companyName)


# class Myclass:
#     class_variable=0
#     def __init__(self):
#         Myclass.class_variable+=1

#     def printClass(self):
#         print(Myclass.class_variable)


# obj=Myclass()
# obj2=Myclass()
# obj.printClass()
# obj2.printClass()
```

Thank You