

Classes and Objects

Executable Code:

```
class MyClass:
```

```
    x = 5
```

```
p1 = MyClass()
```

```
print(p1.x)
```

```
class Person:
```

```
    def __init__(self, name, age):
```

```
        self.name = name
```

```
        self.age = age
```

```
p1 = Person("Om", 21)
```

```
p2 = Person("Darshan",19)
```

```
p3 = Person("Atharva",20)
```

```
print(p1.name)
```

```
print(p1.age)
```

```
print(p2.name)
```

```
print(p2.age)
```

```
print(p3.name)
```

```
print(p3.age)
```

```
class Person:

    def __init__(self, name, age):

        self.name = name

        self.age = age

    def __str__(self):

        return f"{self.name}({self.age})"
```

```
p1 = Person("Om", 21)
p2 = Person("Darshan",19)
p3 = Person("Atharva",20)
```

```
print(p1)
print(p2)
print(p3)
```

```
class Person:

    def __init__(self, name, age):

        self.name = name

        self.age = age

    def myfunc(self):

        print("Hello my name is " + self.name)
```

```
p1 = Person("Om", 21)
```

```
p2 = Person("Darshan",19)
```

```
p3 = Person("Atharva",20)
```

```
p1.myfunc()
```

```
p2.myfunc()
```

```
p3.myfunc()
```

```
class Person:
```

```
    def __init__(mysillyobject, name, age):
```

```
        mysillyobject.name = name
```

```
        mysillyobject.age = age
```

```
    def myfunc(abc):
```

```
        print("Hello my name is " + abc.name)
```

```
p1 = Person("Om", 21)
```

```
p2 = Person("Darshan",19)
```

```
p3 = Person("Atharva",20)
```

```
p1.myfunc()
```

```
print(p1.age)
```

```
p2.myfunc()
```

```
print(p2.age)
```

```
p3.myfunc()
```

```
print(p3.age)
```

```
p1.age = 40
```

```
p2.age = 30
```

```
p3.age = 45
```

```
p1.myfunc()
```

```
print(p1.age)
```

```
p2.myfunc()
```

```
print(p2.age)
```

```
p3.myfunc()
```

```
print(p3.age)
```

```
class Bike:
```

```
    name = ""
```

```
    gear = 0
```

```
bike1 = Bike()
```

```
bike1.gear = 11
```

```
bike1.name = "Mountain Bike"
```

```
print(f"Name: {bike1.name}, Gears: {bike1.gear}")
```

```
class Employee:
```

```
    employee_id = 0
```

```
employee1 = Employee()
```

```
employee2 = Employee()
```

```
employee1.employeeID = 1001  
  
print(f"Employee ID: {employee1.employeeID}")
```

```
employee2.employeeID = 1002  
  
print(f"Employee ID: {employee2.employeeID}")
```

```
class Room:  
  
    length = 0.0  
  
    breadth = 0.0  
  
    def calculate_area(self):  
        print("Area of Room =", self.length * self.breadth)
```

```
study_room = Room()  
  
study_room.length = 42.5  
  
study_room.breadth = 30.8  
  
study_room.calculate_area()
```

```
class Student:  
  
    def __init__(self):  
        self.__roll = 0  
  
        self.__name = ""  
  
        self.__marks = []  
  
        self.__total = 0  
  
        self.__per = 0  
  
        self.__grade = ""
```

```
self.__result = ""
```

```
def setStudent(self):
```

```
    self.__roll = int(input("Enter Roll: "))
```

```
    self.__name = input("Enter Name: ")
```

```
    print("Enter marks of 5 subjects: ")
```

```
    for i in range(5):
```

```
        self.__marks.append(int(input("Subject "+str(i+1)+" : ")))
```

```
def calculateTotal(self):
```

```
    for x in self.__marks:
```

```
        self.__total += x
```

```
def calculatePercentage(self):
```

```
    self.__per = self.__total/5
```

```
def calculateGrade(self):
```

```
    if self.__per >= 85:
```

```
        self.__grade = "S"
```

```
    elif self.__per >= 75:
```

```
        self.__grade = "A"
```

```
    elif self.__per >= 65:
```

```
        self.__grade = "B"
```

```
    elif self.__per >= 55:
```

```
        self.__grade = "C"
```

```
    elif self.__per >= 50:
```

```

        self.__grade = "D"

    else:

        self.__grade = "F"

def calculateResult(self):

    count = 0

    for x in self.__marks:

        if x >= 50:

            count += 1

    if count == 5:

        self.__result = "PASS"

    elif count >= 3:

        self.__result = "COMP."

    else:

        self.__result = "FAIL"

def showStudent(self):

    self.calculateTotal()

    self.calculatePercentage()

    self.calculateGrade()

    self.calculateResult()

print(self.__roll,"\t\t",self.__name,"\t\t",self.__total,"\t\t",self.__per,"\t\t",self.__grade,"\t\t",self.__result)

def main():

    s = Student()

```

```
s.setStudent()
```

```
s.showStudent()
```

```
if __name__ == "__main__":
```

```
    main()
```

```
class Employee:
```

```
    __id = 0
```

```
    __name = ""
```

```
    __gender = ""
```

```
    __city = ""
```

```
    __salary = 0
```

```
def setData(self):
```

```
    self.__id = int(input("Enter Id:\t"))
```

```
    self.__name = input("Enter Name:\t")
```

```
    self.__gender = input("Enter Gender:\t")
```

```
    self.__city = input("Enter City:\t")
```

```
    self.__salary = int(input("Enter Salary:\t"))
```

```
def showData(self):
```

```
    print("Id\t\t:",self.__id)
```

```
    print("Name\t:", self.__name)
```

```
    print("Gender\t:", self.__gender)
```

```
    print("City\t:", self.__city)
```

```
    print("Salary\t:", self.__salary)
```



```
def main():  
    emp = Employee()  
    emp.setData()  
    emp.showData()
```

```
if __name__ == "__main__":  
    main()
```

```
class Check:  
    def __init__(self, number):  
        self.num = number  
  
    def isPrime(self):  
        for i in range(2, int(self.num ** (1/2)) + 1):  
            if self.num % i == 0:  
                return False  
        return True
```

```
if __name__ == "__main__":  
    num = 11  
    check_prime = Check(num)  
    print(check_prime.isPrime())  
  
    num = 14  
    check_prime = Check(num)
```

```
print(check_prime.isPrime())
```

```
class Student:
```

```
    counter = 0
```

```
    def __init__(self, name, age):
```

```
        self.name = name
```

```
        self.age = age
```

```
        Student.counter += 1
```

```
    def printDetails(self):
```

```
        print(self.name, self.age, "years old")
```

```
student1 = Student('Om Pawaskar', 22)
```

```
student2 = Student('Darshan Soni', 21)
```

```
student3 = Student('Sanchit Raul', 21)
```

```
print("Total number of objects created: ", Student.counter)
```

```
class Check:
```

```
    def __init__(self, number):
```

```
        self.num = number
```

```
    def isArmstrong(self):
```

```
        temp = self.num
```

```
        res = 0
```

```
while temp != 0:

    rem = temp % 10

    res += rem ** 3

    temp //= 10

if self.num == res:

    print(self.num, "is Armstrong")

else:

    print(self.num, "is not Armstrong")


if __name__ == "__main__":

    num1 = 153

    num2 = 371

    num3 = 947

    check1 = Check(num1)

    check2 = Check(num2)

    check3 = Check(num3)

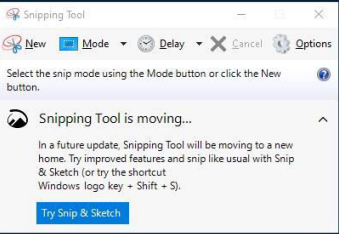
    check1.isArmstrong()

    check2.isArmstrong()

    check3.isArmstrong()
```

Output

```
Python 3.12.1 (tags/v3.12.1:2305ca5, Dec 7 2023, 22:03:25) [MSC v.1937 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/Lab1004/AppData/Local/Programs/Python/Python312/classobjects.py
5
Om
21
Darshan
19
Atharva
20
Om (21)
Darshan (19)
Atharva (20)
Hello my name is Om
Hello my name is Darshan
Hello my name is Atharva
Hello my name is Om
21
Hello my name is Darshan
19
Hello my name is Atharva
20
Hello my name is Om
40
Hello my name is Darshan
30
Hello my name is Atharva
45
Name: Mountain Bike, Gears: 11
```



Snipping Tool

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Activate Windows

```
45
Name: Mountain Bike, Gears: 11
Employee ID: 1001
Employee ID: 1002
Area of Room = 1309.0
Enter Roll: 9
Enter Name: om
Enter marks of 5 subjects:
Subject 1: 90
Subject 2: 90
Subject 3: 90
Subject 4: 90
Subject 5: 90
9          om          450          90.0          S          PASS
Enter Id: 9
Enter Name: o,
Enter Gender: m
Enter City: njg
Enter Salary: 9000
Id : 9
Name : o,
Gender : m
City : njg
Salary : 9000
True
False
Total number of objects created: 3
153 is Armstrong
371 is Armstrong
947 is not Armstrong
```

Activate Windows
Go to Settings