```
# Inheritance

# Syntax for derived a child class

# class subclassname (parentclass1,parentclass2):
#     "optional class documentation string"
#     class_suite

#1. Single Inheritance
class Student:
    "Common Base Class for all Students"
    def getdata(self,rollno,name,course):
        self.rollno=rollno
        self.name=name
        self.course=course
    def displayStudent(self):
        print("Roll Number :",self.rollno)
        print("Name :",self.name)
        print("Course :",self.course)

class Test(Student):
    def getmarks(self,marks):
        self.marks=marks
    def displaymarks(self):
        print("Total CGPA :",self.marks)
a=int(input("Enter the Roll Number :"))
b=input("Enter The Name :")
c=input("Enter The Course : ")
d=float(input("Enter CGPA : "))

# Create an object
print("*******Student Data*******")
stud1=Test() # instance of child
stud1.getdata(a,b,c)
stud1.getmarks(d)
stud1.displayStudent()
stud1.displaymarks()
```

```
Enter the Roll Number :54
Enter The Name :Omprakash Sahani
Enter The Course : COMPUTER SCIENCE AND ENGINEERING
Enter CGPA : 9.00
*******Student Data*******
Roll Number : 54
Name : Omprakash Sahani
Course : COMPUTER SCIENCE AND ENGINEERING
Total CGPA : 9.0
```

```
# Multilevel Inheritance
class Student:
    "Common Base Class for all Students"
    def getdata(self,rollno,name,course):
        self.rollno=rollno
        self.name=name
        self.course=course
    def displayStudent(self):
        print("Roll Number :",self.rollno)
        print("Name :",self.name)
        print("Course :",self.course)

class Test(Student):
    def getmarks(self,marks):
        self.marks=marks
    def displaymarks(self):
        print("Total CGPA :",self.marks)
a=int(input("Enter the Roll Number :"))
b=input("Enter The Name :")
c=input("Enter The Course : ")
d=float(input("Enter CGPA : "))

class Grade(Test):
    def getgrade(self,OUTSTANDING,EXCELLENT):
        self.OUTSTANDING=OUTSTANDING
        self.EXCELLENT=EXCELLENT
    def displayGrade(self):
        if d==10.00:
```

```
            print("**OUTSTANDING GRADE : O**")
        else:
            print("**EXCELLENT GRADE : A+**")

# Create an object
print("*******Student Data*******")
stud1=Grade() # instance of child
stud1.getdata(a,b,c)
stud1.getmarks(d)
stud1.displayStudent()
stud1.displaymarks()
stud1.displayGrade()
```

```
Enter the Roll Number :54
Enter The Name :Omprakash Sahani
Enter The Course : COMPUTER SCIENCE AND ENGINEERING
Enter CGPA : 9.00
*******Student Data*******
Roll Number : 54
Name : Omprakash Sahani
Course : COMPUTER SCIENCE AND ENGINEERING
Total CGPA : 9.0
**EXCELLENT GRADE : A+**
```

```
# Multiple Inheritance
class Student:
    "Common Base Class for all Students"
    def getdata(self,rollno,name,course):
        self.rollno=rollno
        self.name=name
        self.course=course
    def displayStudent(self):
        print("Roll Number :",self.rollno)
        print("Name :",self.name)
        print("Course :",self.course)

class Test(Student):
    def getmarks(self,marks):
        self.marks=marks
    def displaymarks(self):
        print("Total CGPA :",self.marks)
a=int(input("Enter the Roll Number :"))
b=input("Enter The Name :")
c=input("Enter The Course : ")
d=float(input("Enter CGPA : "))

class Sport():
    def getsport(self,sport_marks):
        self.sport_marks=sport_marks
    def displaySport(self):
        print("Total Sport Marks : ",self.sport_marks)
e=int(input("Enter Sports Marks : "))

class Grade(Sport,Test):
    def displayGrade(self):
        if d==10.00:
            print("**OUTSTANDING GRADE : O**")
        else:
            print("**EXCELLENT GRADE : A+**")
    def displaySportGrade(self):
        if e>=80:
            print("**VERY GOOD GRADE : A in Sport**")
        else:
            print("**GOOD GRADE : B in Sport")

# Create an object
print("*******Student Data*******")
stud1=Grade() # instance of child
stud1.getdata(a,b,c)
stud1.getmarks(d)
stud1.getsport(e)
stud1.displayStudent()
stud1.displaymarks()
stud1.displaySport()
stud1.displayGrade()
stud1.displaySportGrade()
```

```
Enter the Roll Number :54
Enter The Name :Omprakash Sahani
Enter The Course : COMPUTER SCIENCE AND ENGINEERING
Enter CGPA : 9.00
Enter Sports Marks : 80
*******Student Data*******
Roll Number : 54
Name : Omprakash Sahani
Course : COMPUTER SCIENCE AND ENGINEERING
Total CGPA : 9.0
Total Sport Marks :  80
**EXCELLENT GRADE : A+**
**VERY GOOD GRADE : A in Sport**
```

```
# Write a program to find the area and perimeter of a rectangle using classes and objects

class Rectangle():
    def area_rect(self,Width,Height):

        self.Width=Width
        self.Height=Height

        a=(self.Width*self.Height)

        print("Width : ",self.Width)
        print("Height : ",self.Height)
        print("Area of Rectangle : ",a)

class Cal(Rectangle):
    def perimeter_rect(self,Width,Height):

        self.Width=Width
        self.Height=Height

        b=2*(self.Width+self.Height)

        print("The Perimeter of Rectangle : ",b)

A=float(input("Enter the Value of Width : "))
B=float(input("Enter the Value of Height : "))

print("*****OUTPUT*****")
Rect=Cal()
Rect.area_rect(A,B)
Rect.perimeter_rect(A,B)
```

```
Enter the Value of Width : 10.8
Enter the Value of Height : 9.02
*****OUTPUT*****
Width :  10.8
Height :  9.02
Area of Rectangle :  97.416
The Perimeter of Rectangle :  39.64
```