Question 1

In [5]:
```
class Marks:

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

    def __add__(self,other):
        return Marks(self.mark + other.mark)

Q1 = Marks(int(input("Quiz 1 (out of 10): ")))
Q2 = Marks(int(input("Quiz 2 (out of 10): ")))
Lab = Marks(int(input("Lab (out of 30): ")))
Mid = Marks(int(input("Mid (out of 20): ")))
Final = Marks(int(input("Final (out of 30): ")))
total = Q1 + Q2 + Lab + Mid + Final
print("Total marks: {}".format(total.mark))
```

```
Quiz 1 (out of 10): 10
Quiz 2 (out of 10): 10
Lab (out of 30): 30
Mid (out of 20): 20
Final (out of 30): 30
Total marks: 100
```

Question 2

In [6]:
```
class Teacher:

    def __init__(self,name,dept):
        self.__name = name
        self.__dept = dept
        self.__lst = []

    def addCourse(self,obj):
        self.__lst.append(obj.course)

    def printDetail(self):
        print("====================================")
        print("Name:",self.__name)
        print("Department:",self.__dept)
        print("List of courses")
        print("====================================")

        index = 0
        while index<len(self.__lst):
            print(self.__lst[index])
            index += 1
        print("====================================")

class Course:

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

t1 = Teacher("Saad Abdullah", "CSE")
t2 = Teacher("Mumit Khan", "CSE")
t3 = Teacher("Sadia Kazi", "CSE")
c1 = Course("CSE 110 Programming Language I")
c2 = Course("CSE 111 Programming Language-II")
c3 = Course("CSE 220 Data Structures")
c4 = Course("CSE 221 Algorithms")
c5 = Course("CCSE 230 Discrete Mathematics")
c6 = Course("CSE 310 Object Oriented Programming")
c7 = Course("CSE 320 Data Communications")
c8 = Course("CSE 340 Computer Architecture")
t1.addCourse(c1)
t1.addCourse(c2)
t2.addCourse(c3)
```

```
t2.addCourse(c4)
t2.addCourse(c5)
t3.addCourse(c6)
t3.addCourse(c7)
t3.addCourse(c8)
t1.printDetail()
t2.printDetail()
t3.printDetail()
```

```
====================================
Name: Saad Abdullah
Department: CSE
List of courses
====================================
CSE 110 Programming Language I
CSE 111 Programming Language-II
====================================
====================================
Name: Mumit Khan
Department: CSE
List of courses
====================================
CSE 220 Data Structures
CSE 221 Algorithms
CCSE 230 Discrete Mathematics
====================================
====================================
Name: Sadia Kazi
Department: CSE
List of courses
====================================
CSE 310 Object Oriented Programming
CSE 320 Data Communications
CSE 340 Computer Architecture
====================================
```

Question 3

In [7]:
```
class Team:

    def __init__(self,name="Blank"):
        self.__name = name
        self.__lst = []

    def setName(self,name):
        self.__name = name

    def addPlayer(self,obj):
        self.__lst.append(obj.player)

    def printDetail(self):
        print("====================================")
        print("Name:",self.__name)
        print("List of players:")
        print(self.__lst)
        print("====================================")

class Player:

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

b = Team()
b.setName('Bangladesh')
mashrafi = Player("Mashrafi")
b.addPlayer(mashrafi)
tamim = Player("Tamim")
b.addPlayer(tamim)
b.printDetail()
a = Team("Australia")
ponting = Player("Ponting")
a.addPlayer(ponting)
lee = Player("Lee")
a.addPlayer(lee)
a.printDetail()
```

```
====================================
Name: Bangladesh
List of players:
['Mashrafi', 'Tamim']
```

```
====================================
====================================
Name: Australia
List of players:
['Ponting', 'Lee']
====================================
```

Question 4

In [8]:
```
class Color:

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

    def __add__(self,other):

        color = self.clr + other.clr

        if (self.clr == 'red' and other.clr == 'yellow') or (self.clr == 'yellow' and other.clr == 'red'):
            clr = 'Orange'
            obj = Color(clr)
            return obj

        elif (self.clr == 'red' and other.clr == 'blue') or (self.clr == 'blue' and other.clr == 'red'):
            clr = 'Violet'
            obj = Color(clr)
            return obj

        elif (self.clr == 'yellow' and other.clr == 'blue') or (self.clr == 'blue' and other.clr == 'yellow'):
            clr = 'Green'
            obj = Color(clr)
            return obj

C1 = Color(input("First Color: ").lower())
C2 = Color(input("Second Color: ").lower())
C3 = C1 + C2
print("Color formed:", C3.clr)
```

```
First Color: red
Second Color: blue
Color formed: Violet
```

Question 5

In [9]:
```
from math import pi
class Circle:

    def __init__(self,value):
        self.__value = value

    def setRadius(self,value):
        self.__value = value

    def getRadius(self):
        return self.__value

    def area(self):
        return  pi*self.__value*self.__value

    def __add__(self,other):
        n = self.__value + other.__value
        obj = Circle(n)
        return obj


c1 = Circle(4)
print("First circle radius:" , c1.getRadius())
print("First circle area:" ,c1.area())
c2 = Circle(5)
print("Second circle radius:" ,c2.getRadius())
print("Second circle area:" ,c2.area())
c3 = c1 + c2
print("Third circle radius:" ,c3.getRadius())
print("Third circle area:" ,c3.area())
```

```
First circle radius: 4
First circle area: 50.26548245743669
Second circle radius: 5
Second circle area: 78.53981633974483
Third circle radius: 9
Third circle area: 254.46900494077323
```

Question 6

In [10]:
```
class Triangle:

    def __init__(self,base,height):
        self.__base = base
        self.__height = height

    def setBase(self,value):
        self.__base = base

    def getBase(self):
        return self.__base

    def setHeight(self,value):
        self.__height = height

    def getHeight(self):
        return self.__height

    def area(self):
        return  float(0.5*self.__base*self.__height)

    def __sub__(self,other):
        new_base = self.__base - other.__base
        new_height = self.__height - other.__height
        obj = Triangle(new_base,new_height)
        return obj


t1 = Triangle(10, 5)
print("First Triangle Base:" , t1.getBase())
print("First Triangle Height:" , t1.getHeight())
print("First Triangle area:" ,t1.area())
t2 = Triangle(5, 3)
print("Second Triangle Base:" , t2.getBase())
print("Second Triangle Height:" , t2.getHeight())
print("Second Triangle area:" ,t2.area())
t3 = t1 - t2
print("Third Triangle Base:" , t3.getBase())
print("Third Triangle Height:" , t3.getHeight())
print("Third Triangle area:" ,t3.area())
```

```
First Triangle Base: 10
First Triangle Height: 5
```

```
First Triangle area: 25.0
Second Triangle Base: 5
Second Triangle Height: 3
Second Triangle area: 7.5
Third Triangle Base: 5
Third Triangle Height: 2
Third Triangle area: 5.0
```

Question 7

In [11]:
```
class Dolls:

    def __init__(self,doll,price):
        self.doll = doll
        self.price = price
        self.count = 0

    def detail(self):
        if self.count == 0:
            print("Doll:"+ self.doll)
            return("Total Price:" +str(self.price) + 'taka')
        else:
            print("Dolls:"+ self.doll)
            return("Total Price:" +str(self.price) + 'taka')

    def __gt__(self,other):

        if (self.price > other.price):
            return True
        else:
            return False

    def __add__(self,other):
        new_doll = self.doll + other.doll
        new_price = self.price + other.price
        obj = Dolls(new_doll,new_price)
        obj.count = 1
        return obj


obj_1 = Dolls("Tweety", 2500)
print(obj_1.detail())
if obj_1 > obj_1:
    print("Congratulations! You get the Tweety as a gift!")
else:
    print("Thank you!")
print("========================")
obj_2 = Dolls("Daffy Duck", 1800)
print(obj_2.detail())
if obj_2 > obj_1:
    print("Congratulations! You get the Tweety as a gift!")
else:
```

```
    print("Thank you!")
print("========================")
obj_3 = Dolls("Bugs Bunny", 3000)
print(obj_3.detail())
if obj_3 > obj_1:
    print("Congratulations! You get the Tweety as a gift!")
else:
    print("Thank you!")
print("========================")
obj_4 = Dolls("Porky Pig", 1500)
print(obj_4.detail())
if obj_4 > obj_1:
    print("Congratulations! You get the Tweety as a gift!")
else:
    print("Thank you!")
print("========================")
obj_5 = obj_2 + obj_3
print(obj_5.detail())
if obj_5 > obj_1:
    print("Congratulations! You get the Tweety as a gift!")
else:
    print("Thank you!")
```

```
Doll:Tweety
Total Price:2500taka
Thank you!
========================
Doll:Daffy Duck
Total Price:1800taka
Thank you!
========================
Doll:Bugs Bunny
Total Price:3000taka
Congratulations! You get the Tweety as a gift!
========================
Doll:Porky Pig
Total Price:1500taka
Thank you!
========================
Dolls:Daffy DuckBugs Bunny
Total Price:4800taka
Congratulations! You get the Tweety as a gift!
```

Question 8

In [12]:
```
class Coordinates:

    def __init__(self,num1,num2):
        self.num1 = num1
        self.num2 = num2

    def detail(self):

        return (self.num1,self.num2)


    def __sub__(self,other):
        new_num1 = self.num1 - other.num1
        new_num2 = self.num2 - other.num2
        obj = Coordinates(new_num1,new_num2)
        return obj

    def __mul__(self,other):
        new_num3 = self.num1 * other.num1
        new_num4 = self.num2 * other.num2
        obj2 = Coordinates(new_num3,new_num4)
        return obj2

    def __eq__(self,other):
        if (self.num1==other.num1) and (self.num2==other.num2):
            return "The calculated coordinates are the same."
        else:
            return "The calculated coordinates are NOT the same."

p1 = Coordinates(int(input()),int(input()))
p2 = Coordinates(int(input()),int(input()))
p4 = p1 - p2
print(p4.detail())
p5 = p1 * p2
print(p5.detail())
point_check = (p4 == p5)
print(point_check)
```

```
1
2
3
4
(-2, -2)
```

```
(3, 8)
The calculated coordinates are NOT the same.
```

In [ ]: