



Inspiring Excellence

Course Code:	CSE111
Course Title:	Programming Language II
Classwork No:	06
Topic:	OOP (HAS-A relationship)
Number of tasks:	4

## Task 1

Design the program to get the output as shown.

**[You are not allowed to change the code below]**

<b># Write your code here</b>  t1 = Teacher("Saad Abdullah", "CSE") t2 = Teacher("Mumit Khan", "CSE") t3 = Teacher("Sadiah 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("CSE 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()	<b>Output:</b> =====
	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 CSE 230 Discrete Mathematics =====
	=====
	Name: Sadiah Kazi Department: CSE List of courses =====
	CSE 310 Object Oriented Programming CSE 320 Data Communications CSE 340 Computer Architecture =====

## Task 2

Please write the **Student** and **Department** class with the necessary properties so that the provided driver code generates the output given below.

Driver Code	Output
<pre> s1 = Student("Akib", 22301010, 3.29) s2 = Student("Reza", 22101010, 3.45) s3 = Student("Ruhan", 23101934, 4.00) print("1=====") cse = Department("CSE") cse.findStudent(22112233) print("2=====") cse.addStudent(s1,s2,s3) print("3=====") cse.details() print("4=====") cse.findStudent(22301010) print("5=====") s4 = Student("Nakib",22301010,3.22) cse.addStudent(s4) print("6=====") s4.setId(21201220) cse.addStudent(s4) print("7=====") cse.details() print("8=====") s5 = Student("Sakib",22201010,2.29) cse.addStudent(s5) print("9=====") cse.details() </pre>	<pre> 1===== Student with this ID doesn't exist, Please give a valid ID 2===== Welcome to CSE department, Akib Welcome to CSE department, Reza Welcome to CSE department, Ruhan 3===== Department Name: CSE Number of student:3 Details of the students: Student name: Akib, ID: 22301010, cgpa: 3.29 Student name: Reza, ID: 22101010, cgpa: 3.45 Student name: Ruhan, ID: 23101934, cgpa: 4.0 4===== Student info: Student Name: Akib ID: 22301010 CGPA: 3.29 5===== Student with the same ID already exists, Please try with another ID 6===== Welcome to CSE department, Nakib 7===== Department Name: CSE Number of student:4 Details of the students: Student name: Akib, ID: 22301010, cgpa: 3.29 Student name: Reza, ID: 22101010, cgpa: 3.45 Student name: Ruhan, ID: 23101934, cgpa: 4.0 Student name: Nakib, ID: 21201220, cgpa: 3.22 8===== Welcome to CSE department, Sakib 9===== Department Name: CSE Number of student:5 Details of the students: Student name: Akib, ID: 22301010, cgpa: 3.29 Student name: Reza, ID: 22101010, cgpa: 3.45 Student name: Ruhan, ID: 23101934, cgpa: 4.0 Student name: Nakib, ID: 21201220, cgpa: 3.22 Student name: Sakib, ID: 22201010, cgpa: 2.29 </pre>

### Task 3

Design the **Vaccine** and **Person** class so that the following expected output is generated.

[N.B: Students will get vaccines on a priority basis. So, age for students doesn't matter]

Driver Code	Output
<pre># Write your code here  astra = Vaccine("AstraZeneca", "UK", 60) modr = Vaccine("Moderna", "UK", 30) sin = Vaccine("Sinopharm", "China", 30) p1 = Person("Bob", 21, "Student") print("=====") p1.pushVaccine(astra) print("=====") p1.showDetail() print("=====") p1.pushVaccine(sin, "2nd Dose") print("=====") p1.pushVaccine(astra, "2nd Dose") print("=====") p1.showDetail() print("=====") p2 = Person("Carol", 23, "Actor") print("=====") p2.pushVaccine(sin) print("=====") p3 = Person("David", 34) print("=====") p3.pushVaccine(modr) print("=====") p3.showDetail() print("=====") p3.pushVaccine(modr, "2nd Dose")</pre>	<pre>===== 1st dose done for Bob ===== Name: Bob Age: 21 Type: Student Vaccine name: AstraZeneca 1st dose: Given 2nd dose: Please come after 60 days ===== Sorry Bob, you can't take 2 different vaccines ===== 2nd dose done for Bob ===== Name: Bob Age: 21 Type: Student Vaccine name: AstraZeneca 1st dose: Given 2nd dose: Given ===== ===== Sorry Carol, Minimum age for taking vaccines is 25 years now. ===== ===== 1st dose done for David ===== Name: David Age: 34 Type: General Citizen Vaccine name: Moderna 1st dose: Given 2nd dose: Please come after 30 days ===== 2nd dose done for David</pre>

## Task 4

1	<code>class msgClass:</code>
2	<code>    def __init__(self):</code>
3	<code>        self.content = 0</code>
4	<code>class Q5:</code>
5	<code>    def __init__(self):</code>
6	<code>        self.sum = 1</code>
7	<code>        self.x = 2</code>
8	<code>        self.y = 3</code>
9	<code>    def methodA(self):</code>
10	<code>        x, y = 1, 1</code>
11	<code>        msg = []</code>
12	<code>        myMsg = msgClass()</code>
13	<code>        myMsg.content = self.x</code>
14	<code>        msg.append(myMsg)</code>
15	<code>        msg[0].content = self.y + myMsg.content</code>
16	<code>        self.y = self.y + self.methodB(msg[0])</code>
17	<code>        y = self.methodB(msg[0]) + self.y</code>
18	<code>        x = y + self.methodB(msg[0], msg)</code>
19	<code>        self.sum = x + y + msg[0].content</code>
20	<code>        print(x, " ", y, " ", self.sum)</code>
21	<code>    def methodB(self, mg1, mg2 = None):</code>
22	<code>        if mg2 == None:</code>
23	<code>            x, y = 5, 6</code>
24	<code>            y = self.sum + mg1.content</code>
25	<code>            self.y = y + mg1.content</code>
26	<code>            x = self.x + 7 +mg1.content</code>
27	<code>            self.sum = self.sum + x + y</code>

28	<code>self.x = mg1.content + x + 8</code>
29	<code>print(x, " ", y, " ", self.sum)</code>
30	<code>return y</code>
31	<code>else:</code>
32	<code>x = 1</code>
33	<code>self.y += mg2[0].content</code>
34	<code>mg2[0].content = self.y + mg1.content</code>
35	<code>x = x + 4 + mg1.content</code>
36	<code>self.sum += x + self.y</code>
37	<code>mg1.content = self.sum - mg2[0].content</code>
38	<code>print(self.x, " ", self.y, " ", self.sum)</code>
39	<code>return self.sum</code>

What is the output of the following code sequence?  <code>q = Q5()</code> <code>q.methodA()</code>	x	y	sum