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**Course Title: Programming Language II**

**Course Code: CSE 111**

**Lab Assignment no: 3 & 4 Merged**

**Task 1**

**Implement** the design of the **Patient** class so that the following output is produced:

[For BMI, the formula is BMI = weight/height^2, where weight is in kg and height in meters]

| **Driver Code** | **Output** |
| --- | --- |
| ***# Write your code here***  p1 = Patient("A", 55, 63.0, 158.0)  p1.printDetails()  print("====================")  p2 = Patient("B", 53, 61.0, 149.0)  p2.printDetails() | Name: A  Age: 55  Weight: 63.0 kg  Height: 158.0 cm  BMI: 25.236340330075304  ====================  Name: B  Age: 53  Weight: 61.0 kg  Height: 149.0 cm  BMI: 27.476239809017613 |

**Task 2**

Design a class Shape for the given code below.

• Write a class Shape.

• Write the required constructor that takes 3 parameters and initialize the instance variables accordingly.

• Write a method area() that prints the area.

**Hint:** the area method can calxculate only for the shapes: Triangle, Rectangle, Rhombus, and Square. So, you have to use conditions inside this method

For this task, assume that --

* for a triangle, the arguments passed are the base and height
* for a rhombus, the arguments passed are the diagonals
* for a square or rectangle, the arguments passed are the sides.

| **Driver Code** | **Output** |
| --- | --- |
| ***# Write your code here***  triangle = Shape("Triangle",10,25)  triangle.area()  print("==========================")  square = Shape("Square",10,10)  square.area()  print("==========================")  rhombus = Shape("Rhombus",18,25)  rhombus.area()  print("==========================")  rectangle = Shape("Rectangle",15,30)  rectangle.area()  print("==========================")  trapezium = Shape("Trapezium",15,30)  trapezium.area() | Area: 125.0  ==========================  Area: 100  ==========================  Area: 225.0  ==========================  Area: 450  ==========================  Area: Shape unknown |

**Task 3**

**Implement** the design of the **Calculator** class so that the following output is produced:

| **Driver Code** | **Output** |
| --- | --- |
| ***# Write your code here***  c1 = Calculator()  print("==================")  val = c1.calculate(10, 20, '+')  print("Returned value:", val)  c1.showCalculation()  print("==================")  val = c1.calculate(val, 10, '-')  print("Returned value:", val)  c1.showCalculation()  print("==================")  val = c1.calculate(val, 5, '\*')  print("Returned value:", val)  c1.showCalculation()  print("==================")  val = c1.calculate(val, 16, '/')  print("Returned value:", val)  c1.showCalculation() | Calculator is ready!  ==================  Returned value: 30  10 + 20 = 30  ==================  Returned value: 20  30 - 10 = 20  ==================  Returned value: 100  20 \* 5 = 100  ==================  Returned value: 6.25  100 / 16 = 6.25 |

**Task 4**

Design the **Programmer** class in such a way so that the following code provides the expected output.

**Hint:**

* + Write the constructor with appropriate printing and multiple arguments.
  + Write the addExp() method with appropriate printing and argument.
  + Write the printDetails() method

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

| ***# Write your code here.***  p1 = Programmer("Ethen Hunt", "Java", 10)  p1.printDetails()  print('--------------------------')  p2 = Programmer("James Bond", "C++", 7)  p2.printDetails()  print('--------------------------')  p3 = Programmer("Jon Snow", "Python", 4)  p3.printDetails()  p3.addExp(5)  p3.printDetails() | ***OUTPUT:***  Horray! A new programmer is born  Name: Ethen Hunt  Language: Java  Experience: 10 years.  --------------------------  Horray! A new programmer is born  Name: James Bond  Language: C++  Experience: 7 years.  --------------------------  Horray! A new programmer is born  Name: Jon Snow  Language: Python  Experience: 4 years.  Updating experience of Jon Snow  Name: Jon Snow  Language: Python  Experience: 9 years. |
| --- | --- |

**Task 5**

**Implement** the design of the **UberEats** class so that the following output is produced:

[For simplicity, you can assume that a customer will always order exact 2 items]

| **Driver Code** | **Output** |
| --- | --- |
| ***# Write your code here***  order1 = UberEats("Shakib", "01719658xxx", "Mohakhali")  print("=========================")  order1.add\_items("Burger", "Coca Cola", 220, 50)  print("=========================")  print(order1.print\_order\_detail())  print("=========================")  order2 = UberEats ("Siam", "01719659xxx", "Uttara")  print("=========================")  order2.add\_items("Pineapple", "Dairy Milk", 80, 70)  print("=========================")  print(order2.print\_order\_detail()) | Shakib, welcome to UberEats!  =========================  =========================  User details: Name: Shakib, Phone: 01719658xxx, Address: Mohakhali  Orders: {'Burger': 220, 'Coca Cola': 50}  Total Paid Amount: 270  =========================  Siam, welcome to UberEats!  =========================  =========================  User details: Name: Siam, Phone: 01719659xxx, Address: Uttara  Orders: {'Pineapple': 80, 'Dairy Milk': 70}  Total Paid Amount: 150 |

**Task 6**

Write a class called **Customer** with the required constructor and methods to get the following output.

**Subtasks:**

1. Create a class called Customer.
2. Create the required constructor.
3. Create a method called **greet** that works if no arguments are passed or if one argument is passed. *(Hint: You may need to use the keyword NONE)*
4. Create a method called **purchase** that can take as many arguments as the user wants to give.

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

| ***# Write your codes for subtasks 1-4 here.***  customer\_1 = Customer("Sam")  customer\_1.greet()  customer\_1.purchase("chips", "chocolate", "orange juice")  print("-----------------------------")  customer\_2 = Customer("David")  customer\_2.greet("David")  customer\_2.purchase("orange juice") | ***OUTPUT:***  Hello!  Sam, you purchased 3 item(s):  chips  chocolate  orange juice  -----------------------------  Hello David!  David, you purchased 1 item(s):  orange juice |
| --- | --- |

**Task 7**

Analyze the given code below to write **Cat** class to get the output as shown.

Hints:

* *Remember, the constructor is a special method. Here, you have to deal with constructor overloading which is similar to method overloading.*
* *You may need to use the keyword None*
* *Your class should have 2 variables*

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

| ***#Write your code here***    c1 = Cat()  c2 = Cat("Black")  c3 = Cat("Brown", "jumping")  c4 = Cat("Red", "purring")  c1.printCat()  c2.printCat()  c3.printCat()  c4.printCat()  c1.changeColor("Blue")  c3.changeColor("Purple")  c1.printCat()  c3.printCat() | ***OUTPUT***  White cat is sitting  Black cat is sitting  Brown cat is jumping  Red cat is purring  Blue cat is sitting  Purple cat is jumping |
| --- | --- |

**Task 8**

Design the **Student** class such a way so that the following code provides the expected output.

**Hint:**

* Write the constructor with appropriate default value for arguments.
* Write the dailyEffort() method with appropriate arguments.
* Write the printDetails() method. For printing suggestions check the following instructions.
  + If hour <= 2 print 'Suggestion: Should give more effort!'
  + If hour <= 4 print 'Suggestion: Keep up the good work!'
  + Else print 'Suggestion: Excellent! Now motivate others.'

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

| ***# Write your code here.***  harry = Student('Harry Potter', 123)  harry.dailyEffort(3)  harry.printDetails()  print('========================')  john = Student("John Wick", 456, "BBA")  john.dailyEffort(2)  john.printDetails()  print('========================')  naruto = Student("Naruto Uzumaki", 777, "Ninja")  naruto.dailyEffort(6)  naruto.printDetails() | ***OUTPUT:***  Name: Harry Potter  ID: 123  Department: CSE  Daily Effort: 3 hour(s)  Suggestion: Keep up the good work!  ========================  Name: John Wick  ID: 456  Department: BBA  Daily Effort: 2 hour(s)  Suggestion: Should give more effort!  ========================  Name: Naruto Uzumaki  ID: 777  Department: Ninja  Daily Effort: 6 hour(s)  Suggestion: Excellent! Now motivate others. |
| --- | --- |

**Task 9**

**Implement** the design of the **Batsman** class so that the following output is produced:

**Hint**: Batting strike rate (s/r) = runsScored / ballsFaced x 100.

| **Driver Code** | **Output** |
| --- | --- |
| ***# Write your code here***  b1 = Batsman(6101, 7380)  b1.printCareerStatistics()  print("============================")  b2 = Batsman("Liton Das", 678, 773)  b2.printCareerStatistics()  print("----------------------------")  print(b2.battingStrikeRate())  print("============================")  b1.setName("Shakib Al Hasan")  b1.printCareerStatistics()  print("----------------------------")  print(b1.battingStrikeRate()) | Name: New Batsman  Runs Scored: 6101 , Balls Faced: 7380  ============================  Name: Liton Das  Runs Scored: 678 , Balls Faced: 773  ----------------------------  87.71021992238033  ============================  Name: Shakib Al Hasan  Runs Scored: 6101 , Balls Faced: 7380  ----------------------------  82.66937669376694 |

**Task 10**

**Implement** the design of the **Author** class so that the following output is produced:

| **Driver Code** | **Output** |
| --- | --- |
| ***# Write your code here***  auth1 = Author('Humayun Ahmed')  auth1.addBooks('Deyal', 'Megher Opor Bari')  auth1.printDetails()  print("===================")  auth2 = Author()  print(auth2.name)  auth2.changeName('Mario Puzo')  auth2.addBooks('The Godfather', 'Omerta', 'The Sicilian')  print("===================")  auth2.printDetails()  print("===================")  auth3 = Author('Paolo Coelho', 'The Alchemist', 'The Fifth Mountain')  auth3.printDetails() | Author Name: Humayun Ahmed  --------  List of Books:  Deyal  Megher Opor Bari  ===================  Default  ===================  Author Name: Mario Puzo  --------  List of Books:  The Godfather  Omerta  The Sicilian  ===================  Author Name: Paolo Coelho  --------  List of Books:  The Alchemist  The Fifth Mountain |

**Task 11**

Using **TaxiLagbe** apps, users can share a single taxi with multiple people.

**Implement** the design of the **TaxiLagbe** class so that the following output is produced:

**Hint:**

1. Each taxi can carry maximum 4 passengers

2. addPassenger() method takes the last name of the passenger and ticket fare for that person in an underscore (-) separated string.

| **Driver Code** | **Output** |
| --- | --- |
| ***# Write your code here***  # Do not change the following lines of code.  taxi1 = TaxiLagbe('1010-01', 'Dhaka')  print('-------------------------------')  taxi1.addPassenger('Walker\_100', 'Wood\_200')  taxi1.addPassenger('Matt\_100')  taxi1.addPassenger('Wilson\_105')  print('-------------------------------')  taxi1.printDetails()  print('-------------------------------')  taxi1.addPassenger('Karen\_200')  print('-------------------------------')  taxi1.printDetails()  print('-------------------------------')  taxi2 = TaxiLagbe('1010-02', 'Khulna')  taxi2.addPassenger('Ronald\_115')  taxi2.addPassenger('Parker\_215')  print('-------------------------------')  taxi2.printDetails() | --------------------------------------  Dear Walker! Welcome to TaxiLagbe.  Dear Wood! Welcome to TaxiLagbe.  Dear Matt! Welcome to TaxiLagbe.  Dear Wilson! Welcome to TaxiLagbe.  --------------------------------------  Trip info for Taxi number: 1010-01  This taxi can cover only Dhaka area.  Total passengers: 4  Passenger lists:  Walker, Wood, Matt, Wilson  Total collected fare: 505 Taka  --------------------------------------  Taxi Full! No more passengers can be added.  --------------------------------------  Trip info for Taxi number: 1010-01  This taxi can cover only Dhaka area.  Total passengers: 4  Passenger lists:  Walker, Wood, Matt, Wilson  Total collected fare: 505 Taka  --------------------------------------  Dear Ronald! Welcome to TaxiLagbe.  Dear Parker! Welcome to TaxiLagbe.  --------------------------------------  Trip info for Taxi number: 1010-02  This taxi can cover only Khulna area.  Total passengers: 2  Passenger lists:  Ronald, Parker  Total collected fare: 330 Taka |

**Task 12**

**Implement** the design of the **Account** class so that the following output is produced:

| **Driver Code** | **Output** |
| --- | --- |
| ***# Write your code here***  a1 = Account()  print(a1.details())  print("------------------------")  a1.name = "Oliver"  a1.balance = 10000.0  print(a1.details())  print("------------------------")  a2 = Account("Liam")  print(a2.details())  print("------------------------")  a3 = Account("Noah",400)  print(a3.details())  print("------------------------")  a1.withdraw(6930)  print("------------------------")  a2.withdraw(600)  print("------------------------")  a1.withdraw(6929) | Default Account  0.0  ------------------------  Oliver  10000.0  ------------------------  Liam  0.0  ------------------------  Noah  400.0  ------------------------  Sorry, Withdraw unsuccessful! The account balance after deducting withdraw amount is equal to or less than minimum.  ------------------------  Sorry, Withdraw unsuccessful! The account balance after deducting withdraw amount is equal to or less than minimum.  ------------------------  Withdraw successful! New balance is: 3071.0 |

**Task 13**

**Implement** the design of the **StudentDatabase** class so that the following output is produced:

GPA = Sum of (Grade Points \* Credits)/ Credits attempted

| **Driver Code** | **Output** |
| --- | --- |
| ***# Write your code here***  # Do not change the following lines of code.  s1 = StudentDatabase('Pietro', '10101222')  s1.calculateGPA(['CSE230: 4.0', 'CSE220: 4.0', 'MAT110: 4.0'], 'Summer2020')  s1.calculateGPA(['CSE250: 3.7', 'CSE330: 4.0'], 'Summer2021')  print(f'Grades for {s1.name}\n{s1.grades}')  print('------------------------------------------------------')  s1.printDetails()  s2 = StudentDatabase('Wanda', '10103332')  s2.calculateGPA(['CSE111: 3.7', 'CSE260: 3.7', 'ENG101: 4.0'], 'Summer2022')  print('------------------------------------------------------')  print(f'Grades for {s2.name}\n{s2.grades}')  print('------------------------------------------------------')  s2.printDetails() | Grades for Pietro  {'Summer2020': {('CSE230', 'CSE220', 'MAT110'): 4.0}, 'Summer2021': {('CSE250', 'CSE330'): 3.85}}  -----------------------------------------------  Name: Pietro  ID: 10101222  Courses taken in Summer2020:  CSE230  CSE220  MAT110  GPA: 4.0  Courses taken in Summer2021:  CSE250  CSE330  GPA: 3.85  -----------------------------------------------  Grades for Wanda  {'Summer2022': {('CSE111', 'CSE260', 'ENG101'): 3.8}}  -----------------------------------------------  Name: Wanda  ID: 10103332  Courses taken in Summer2022:  CSE111  CSE260  ENG101  GPA: 3.8 |

**Task 14**

| **1** | **class Test3:** |
| --- | --- |
| **2** | **def \_\_init\_\_(self):** |
| **3** | **self.sum, self.y = 0, 0** |
| **4** | **def methodA(self):** |
| **5** | **x, y = 2, 3** |
| **6** | **msg = [0]** |
| **7** | **msg[0] = 3** |
| **8** | **y = self.y + msg[0]** |
| **9** | **self.methodB(msg, msg[0])** |
| **10** | **x = self.y + msg[0]** |
| **11** | **self.sum = x + y + msg[0]** |
| **12** | **print(x, y, self.sum)** |
| **13** | **def methodB(self, mg2, mg1):** |
| **14** | **x = 0** |
| **15** | **self.y = self.y + mg2[0]** |
| **16** | **x = x + 33 + mg1** |
| **17** | **self.sum = self.sum + x + self.y** |
| **18** | **mg2[0] = self.y + mg1** |
| **19** | **mg1 = mg1 + x + 2** |
| **20** | **print(x, self.y, self.sum)** |

| **Write the output of the following code:**  **t3 = Test3()**  **t3.methodA()**  **t3.methodA()**  **t3.methodA()**  **t3.methodA()** | **x** | **y** | **sum** |
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**Task 15**

| **1** | **class Test5:** |
| --- | --- |
| **2** | **def \_\_init\_\_(self):** |
| **3** | **self.sum, self.y = 0, 0** |
| **4** | **def methodA(self):** |
| **5** | **x = 0** |
| **6** | **z = 0** |
| **7** | **while (z < 5):** |
| **8** | **self.y = self.y + self.sum** |
| **9** | **x = self.y + 1** |
| **10** | **print(x, self.y, self.sum)** |
| **11** | **self.sum = self.sum + self.methodB(x, self.y)** |
| **12** | **z += 1** |
| **13** | **def methodB(self, m, n):** |
| **14** | **x = 0** |
| **15** | **sum = 0** |
| **16** | **self.y = self.y + m** |
| **17** | **x = n - 4** |
| **18** | **sum = sum + self.y** |
| **19** | **print(x, self.y, sum)** |
| **20** | **return self.sum** |

| **Write the output of the following code:**  **t5 = Test5()**  **t5.methodA()** | **x** | **y** | **sum** |
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**Task 16**

| **1** | **class FinalT6A:** |
| --- | --- |
| **2** | **def \_\_init\_\_(self, x, p):** |
| **3** | **self.temp, self.sum, self.y = 4, 0, 1** |
| **4** | **self.temp += 1** |
| **5** | **self.y = self.temp - p** |
| **6** | **self.sum = self.temp + x** |
| **7** | **print(x, self.y, self.sum)** |
| **8** | **def methodA(self):** |
| **9** | **x = 0** |
| **10** | **y = 0** |
| **11** | **y = y + self.y** |
| **12** | **x = self.y + 2 + self.temp** |
| **13** | **self.sum = x + y + self.methodB(self.temp, y)** |
| **14** | **print(x, y, self.sum)** |
| **15** | **def methodB(self, temp, n):** |
| **16** | **x = 0** |
| **17** | **temp += 1** |
| **18** | **self.y = self.y + temp** |
| **19** | **x = x + 3 + n** |
| **20** | **self.sum = self.sum + x + self.y** |
| **21** | **print(x, self.y, self.sum)** |
| **22** | **return self.sum** |

| **What is the output of the following code sequence?**  **q1 = FinalT6A(2,1)**  **q1.methodA()**  **q1.methodA()** | **x** | **y** | **sum** |
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**Task 17**

| **1** | **class Test5:** |
| --- | --- |
| **2** | **def \_\_init\_\_(self):** |
| **3** | **self.sum = 0** |
| **4** | **self.y = 0** |
| **5** | **def methodA(self):** |
| **6** | **x=y=k=0** |
| **7** | **msg = [5]** |
| **8** | **while (k < 2):** |
| **9** | **y += msg[0]** |
| **10** | **x = y + self.methodB(msg, k)** |
| **11** | **self.sum = x + y + msg[0]** |
| **12** | **print(x ," " , y, " " , self.sum)** |
| **13** | **k+=1** |
| **14** | **def methodB(self, mg2, mg1):** |
| **15** | **x = 0** |
| **16** | **self.y += mg2[0]** |
| **17** | **x = x + 3 + mg1** |
| **18** | **self.sum += x + self.y** |
| **19** | **mg2[0] = self.y + mg1** |
| **20** | **mg1 += x + 2** |
| **21** | **print(x , " " ,self.y, " " , self.sum)** |
| **22** | **return mg1** |

| **What is the output of the following code sequence?**  **t1 = Test5()**  **t1.methodA()**  **t1.methodA()**  **t1.methodA()** | **x** | **y** | **sum** |
| --- | --- | --- | --- |
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**Task 18**

| **1** | **class Test4:** |
| --- | --- |
| **2** | **def \_\_init\_\_(self):** |
| **3** | **self.sum, self.y = 0, 0** |
| **4** | **def methodA(self):** |
| **5** | **x, y = 0, 0** |
| **6** | **msg = [0]** |
| **7** | **msg[0] = 5** |
| **8** | **y = y + self.methodB(msg[0])** |
| **9** | **x = y + self.methodB(msg, msg[0])** |
| **10** | **self.sum = x + y + msg[0]** |
| **11** | **print(x, y, self.sum)** |
| **12** | **def methodB(self, \*args):** |
| **13** | **if len(args) == 1:** |
| **14** | **mg1 = args[0]** |
| **15** | **x, y = 0, 0** |
| **16** | **y = y + mg1** |
| **17** | **x = x + 33 + mg1** |
| **18** | **self.sum = self.sum + x + y** |
| **19** | **self.y = mg1 + x + 2** |
| **20** | **print(x, y, self.sum)** |
| **21** | **return y** |
| **22** | **else:** |
| **23** | **mg2, mg1 = args** |
| **24** | **x = 0** |
| **25** | **self.y = self.y + mg2[0]** |
| **26** | **x = x + 33 + mg1** |
| **27** | **self.sum = self.sum + x + self.y** |
| **28** | **mg2[0] = self.y + mg1** |
| **29** | **mg1 = mg1 + x + 2** |
| **30** | **print(x, self.y, self.sum)** |
| **31** | **return self.sum** |

| **t3 = Test4()**  **t3.methodA()**  **t3.methodA()**  **t3.methodA()**  **t3.methodA()** | **x** | **y** | **sum** |
| --- | --- | --- | --- |
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**Task 19**

| **1** | **class msgClass:** |
| --- | --- |
| **2** | **def \_\_init\_\_(self):** |
| **3** | **self.content = 0** |
| **4** | **class Q5:** |
| **5** | **def \_\_init\_\_(self):** |
| **6** | **self.sum = 1** |
| **7** | **self.x = 2** |
| **8** | **self.y = 3** |
| **9** | **def methodA(self):** |
| **10** | **x, y = 1, 1** |
| **11** | **msg = []** |
| **12** | **myMsg = msgClass()** |
| **13** | **myMsg.content = self.x** |
| **14** | **msg.append(myMsg)** |
| **15** | **msg[0].content = self.y + myMsg.content** |
| **16** | **self.y = self.y + self.methodB(msg[0])** |
| **17** | **y = self.methodB(msg[0]) + self.y** |
| **18** | **x = y + self.methodB(msg[0], msg)** |
| **19** | **self.sum = x + y + msg[0].content** |
| **20** | **print(x," ", y," ", self.sum)** |
| **21** | **def methodB(self, mg1, mg2 = None):** |
| **22** | **if mg2 == None:** |
| **23** | **x, y = 5, 6** |
| **24** | **y = self.sum + mg1.content** |
| **25** | **self.y = y + mg1.content** |
| **26** | **x = self.x + 7 +mg1.content** |
| **27** | **self.sum = self.sum + x + y** |
| **28** | **self.x = mg1.content + x +8** |
| **29** | **print(x, " ", y," ", self.sum)** |
| **30** | **return y** |
| **31** | **else:** |
| **32** | **x = 1** |
| **33** | **self.y += mg2[0].content** |
| **34** | **mg2[0].content = self.y + mg1.content** |
| **35** | **x = x + 4 + mg1.content** |
| **36** | **self.sum += x + self.y** |
| **37** | **mg1.content = self.sum - mg2[0].content** |
| **38** | **print(self.x, " ",self.y," ", self.sum)** |
| **39** | **return self.sum** |

| **What is the output of the following code sequence?**  **q = Q5()**  **q.methodA()** | **x** | **y** | **sum** |
| --- | --- | --- | --- |
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**Practice Task (20 - 25) Ungraded**

**Task 20**

Design a **Student** class so that the following output is produced upon executing the following code

| **Driver Code** | **Output** |
| --- | --- |
| ***# Write your code here***  **# Do not change the following lines of code.**  s1 = Student()  print("=========================")  s2 = Student("Carol")  print("=========================")  s3 = Student("Jon", "EEE")  print("=========================")  s1.update\_name("Bob")  s1.update\_department("CSE")  s2.update\_department("BBA")  s1.enroll("CSE110", "MAT110", "ENG091")  s2.enroll("BUS101")  s3.enroll("MAT110", "PHY111")  print("###########################")  s1.printDetail()  print("=========================")  s2.printDetail()  print("=========================")  s3.printDetail() | Student name and department need to be set  =========================  Department for Carol needs to be set  =========================  Jon is from EEE department  =========================  ###########################  Name: Bob  Department: CSE  Bob enrolled in 3 course(s):  CSE110, MAT110, ENG091  =========================  Name: Carol  Department: BBA  Carol enrolled in 1 course(s):  BUS101  =========================  Name: Jon  Department: EEE  Jon enrolled in 2 course(s):  MAT110, PHY111 |

**Task 21**

Design a **Student** class so that the following output is produced upon executing the following code:

[Hint: Each course has 3.0 credit hours. You must take at least 9.0 and at most 12.0 credit hours]

| **Driver Code** | **Output** |
| --- | --- |
| ***# Write your code here***  **# Do not change the following lines of code.**  s1 = Student(“Alice”,“20103012”,“CSE”)  s2 = Student(“Bob”, “18301254”,“EEE”)  s3 = Student(“Carol”, “17101238”,“CSE”)  print(“##########################”)  print(s1.details())  print(“##########################”)  print(s2.details())  print(“##########################”)  s1.advise(“CSE110”, “MAT110”, “PHY111”)  print(“##########################”)  s2.advise(“BUS101”, “MAT120”)  print(“##########################”)  s3.advise(“MAT110”, “PHY111”, “ENG102”,  “CSE111”, “CSE230”) | ##########################  Name: Alice  ID: 20103012  Department: CSE  ##########################  Name: Bob  ID: 18301254  Department: EEE  ##########################  Alice, you have taken 9.0 credits.  List of courses: CSE110, MAT110, PHY111  Status: Ok  ##########################  Bob, you have taken 6.0 credits.  List of courses: BUS101, MAT120  Status: You have to take at least 1 more course.  ##########################  Carol, you have taken 15.0 credits.  List of courses: MAT110, PHY111, ENG102,  CSE111, CSE230  Status: You have to drop at least 1 course. |

**Task 22**

Write the **Hotel** class with the required methods to give the following output as shown.

| **Driver Code** | **Output** |
| --- | --- |
| ***# Write your code here***  **# Do not change the following lines of code.**  h = Hotel("Lakeshore")  h.addStuff( "Adam", 26)  print("=================================")  print(h.getStuffById(1))  print("=================================")  h.addGuest(“Carol”,35,”123”)  print("=================================")  print(h.getGuestById(1))  print("=================================")  h.addGuest("Diana", 32, “431”)  print("=================================")  print(h.getGuestById(2))  print("=================================")  h.allStaffs()  print("=================================")  h.allGuest() | Staff With ID 1 is added  =================================  Staff ID: 1  Name: Adam  Age: 26  Phone no.: 000  =================================  Guest With ID 1 is created  =================================  Guest ID: 1  Name: Carol  Age: 35  Phone no.: 123  =================================  Guest With ID 2 is created  =================================  Guest ID: 2  Name: Dianal  Age: 32  Phone no.: 431  =================================  All Staffs:  Number of Staff: 1  Staff ID: 1 Name: Adam Age: 26 Phone no: 000  =================================  All Guest:  Number of Guest: 2  Guest ID: 1 Name: Carol Age: 35 Phone no.: 123  Guest ID: 2 Name: Dianal Age: 32 Phone no.: 431 |

**Task 23**

Write the **Author** class with the required methods to give the following outputs as shown.

| **Driver Code** | **Output** |
| --- | --- |
| ***# Write your code here***  **# Do not change the following lines of code.**  a1 = Author()  print("=================================")  a1.addBook(“Ice”, “Science Fiction”)  print("=================================")  a1.setName(“Anna Kavan”)  a1.addBook(“Ice”, “Science Fiction”)  a1.printDetail()  print("=================================")  a2 = Author(“Humayun Ahmed”)  a2.addBook(“Onnobhubon”, “Science Fiction”)  a2.addBook(“Megher Upor Bari”, “Horror”)  print("=================================")  a2.printDetail()  a2.addBook(“Ireena”, “Science Fiction”)  print("=================================")  a2.printDetail()  print("=================================") | =================================  A book can not be added without author name  =================================  Number of Book(s): 1  Author Name: Anna Kavan  Science Fiction: Ice  =================================  =================================  Number of Book(s): 2  Author Name: Humayun Ahmed  Science Fiction: Onnobhubon  Horror: Megher Upor Bari  =================================  Number of Book(s): 3  Author Name: Humayun Ahmed  Science Fiction: Onnobhubon, Ireena  Horror: Megher Upor Bari  ================================= |

**Task 24**

**Implement** the design of the **Hospital, Doctor and Patient** class so that the following output is produced:

| **Driver Code** | **Output** |
| --- | --- |
| ***# Write your code here***  **# Do not change the following lines of code.**  h = Hospital("Evercare")  d1 = Doctor("1d","Doctor", "Samar Kumar", "Neurologist")  h.addDoctor(d1)  print("=================================")  print(h.getDoctorByID("1d"))  print("=================================")  p1 = Patient("1p","Patient", "Kashem Ahmed", 35, 12345)  h.addPatient(p1)  print("=================================")  print(h.getPatientByID("1p"))  print("=================================")  p2 = Patient ("2p","Patient", "Tanina Haque", 26, 33456)  h.addPatient(p2)  print("=================================")  print(h.getPatientByID("2p"))  print("=================================")  h.allDoctors()  h.allPatients() | =================================  Doctor's ID: 1d  Name: Samar Kumar  Speciality: Neurologist  =================================  =================================  Patient's ID: 1p  Name: Kashem Ahmed  Age: 35  Phone no.: 12345  =================================  =================================  Patient's ID: 2p  Name: Tanina Haque  Age: 26  Phone no.: 33456  =================================  All Doctors:  Number of Doctors: 1  {'1d': ['Samar Kumar', 'Neurologist']}  All Patients:  Number of Patients: 2  {'1p': ['Kashem Ahmed', 35, 12345], '2p': ['Tanina Haque', 26, 33456]} |

**Task 25**

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** |
| --- | --- |
| ***# 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") | =================================  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 |