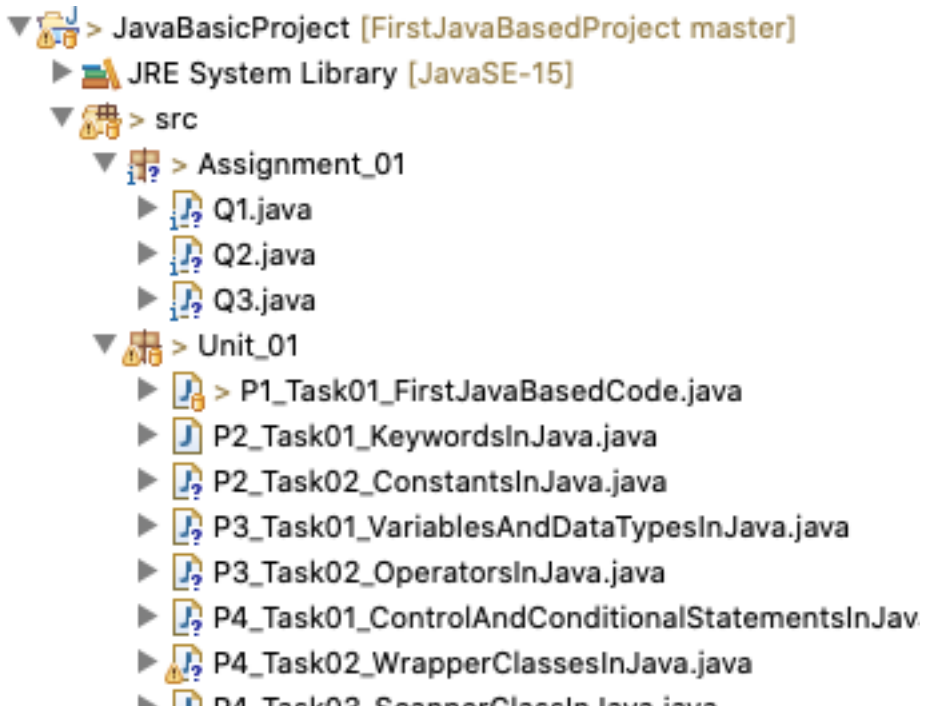
Assignment_01
Unit_01 && Unit_02
Java Programming [TCS-408]

Instructions:

1- Create a folder name Assignment_01 in the same workspace where you have created Unit_01 and Unit_02. Kindly follow the image.



2- Create Q1, Q2, Q3 and so on for all coding related questions in this assignment

3- Deadlines and Links:

- You guys are supposed to complete this assignment by **11PM 28th April 2022** over GitHub and the video by **5PM 8th May-2022**.
- Use the given link to provide the GitHub link for this assignment. Choose Assignment_01 from the list.
- Link: https://forms.office.com/r/5gTEjej6CK

4- Post exam you guys have to submit a small video of this assignment in given format and order:
    a. Use Project or Thread file [A4 Size]
    b. Take printout of all the codes with their terminal output from Assignment_01 folder you have created in the same work space
    c. All the pages would be of A4 size
    d. First page would be your information page
    e. After first page put the print out of this Assignment_01 [Take printout of this pdf]
    f. Now at last, Combine all the answers [Handwritten and Printouts] according to the order of the questions.

5- Now create a small video of this Assignment_01 from phone and flip the pages of the file slowly.

6- Do upload this small video [30 seconds expected], over your G-drive

7- Now create a public link of this video [use share with everyone with this link option]

8- Finally, use this link to upload the link of your video. https://forms.office.com/r/5gTEjej6CK

Questions:

Q1- WAP which would contain 6 objects, of a class
Student. Student [Name, Age, section, percentage]. They all belong to Section-A. Your program would be able to find the average percentage of students in this section. Use constructors to create these 6 objects and input from Scanner class.

Q2- WAP to count the total number of calls for a member function from more than one objects. [Let's say, from 3 such Objects]

Q3- Given an interface in1 which includes a method display which takes an integer as input .

```
interface In1
{
   void display(int p);
}
```

Task is to write a class testClass which implements interface In1 and has a method named display which takes an integer as an input p and the display method should be able to tell if the number is prime or not?
- The main method should not be in testClass, create a separate class for that.

Q4. Create a multi-level inheritance hierarchy from ClassOne, ClassTwo, ClassThree classes.

ClassOne contains one, single parameterized constructor
ClassTwo contains only a default constructor
ClassThree contains one, single parameterized constructor and a default constructor.

Create an object of top child class and make sure the constructor execution will take place according to respective multi-level inheritance hierarchy.

```
ClassThree obj = new ClassThree(1);
ClassThree obj = new ClassThree();
```

5Q. WAP in Java which would contain 8 objects of a Class Employee. Employee contains name, age, department, salary. Your program would be able to calculate the total salary to be paid in each department. Use constructors to create these 8 objects and Scanner to take inputs.

Restrictions:

1- Minimum 8 objects [can be created manually with parameterized constructors with Scanner input]
2- Departments are, A, B, C, D: minimum 4 departments [String Type]
3- If the Salary exceeds more than 30,000, then the default salary would be 25000 of any of the employee
4- Use array of objects, instead of using multiple 8 objects separately Use:

```
Employee arr[] = new Employee[8];

And

arr[i].department.equals("A");
```

Q6. As given there are two sample methods: First one returns the sum of two numbers a and b and second one returns the subtraction of a and b. if a-b is negative then return value would be 0. Use ternary operator to call these two methods. If a>b then ternary should call sum(a,b) but if a<b then ternary operator should call sub(a,b). Eventually print the result of the ternary operation on variable a and b.
Note: Ternary operator can call a method even for true and false values

Q7. WAP to count the total number of calls for a member function: display(), from more than one objects and how many times the object is created of a class name Employee.
Note: Call display() function from more than 3 objects

Q8. WAP in java, to delete index=3, element from the given array mentioned below.

Int[] arr = {1,2,3,4,5,6,7,8,9}
Note: Non relevance places would be filled with zeros.

Q9. WAP in java, which would demonstrate access protection over a class and a variable of that class.

Note: class can be public and default while variable can be default, private, protected, and public.
(If required then do create more than 2 packages)

Q10. WAP in Java Program To Survey Four Different Car Models For Four Different Cities:

	Maruti-K10	Zen-Astelo	Wagnor	Maruti-SX4
Delhi				
Mumbai				
Cheenai				
Kolkatta				

Your job is to find out the total number of cars sold of each model in all the cities. Use Array of objects or multiple objects of class name City.

Q11. As given there are two sample methods: First one returns the sum of two numbers a and b and second one returns the subtraction of a and b. if a-b is negative then return value would be 0. Use ternary operator to call these two methods. If a>b then ternary should call sum(a,b) but if a<b then ternary operator should call sub(a,b). Eventually print the result of the ternary operation on variable a and b.
Note: Ternary operator can call a method even for true and false values

Q12. If We Place Return Type In Constructor Prototype Will It Leads To Error?

Q13. How Compiler And Jvm Can Differentiate Constructor And Method Definitions Of Both Have Same Class Name?

Q14. Can we create a private constructor?

Q15. Can we have a Constructor in an Interface?

Q16. Describe various forms of implementing interfaces and extending an Abstract Class. Explain it with suitable examples.

Note:

Interface:

1. Functional Interface [only on abstract method, like runnable]
2. Marker interface [0-any abstract methods]

Abstract Class:

1. Pure or 100% abstract class
2. Normal Abstract Class [0-100% abstract methods]

Q17. How a 100% abstract class is different from an Interface. Provide suitable code if required.

Q18. How local static variable is different from global static variable?

Q19. Why we cannot create a private and protected class in Java?

Q20. What happens if we add final keyword with Class, Method and a variable in java. Explain it through suitable code if required.