CSE 2001: Data Structure & Algorithms

Programming Assignment-I

(Java Primer)

1. Write a Java program that takes as input three integers, *a*, *b*, and *c*, from the Java console and determines if they can be used in a correct arithmetic formula (in the given order), like *"a + b = c," "a = b − c," or "a ∗ b = c."*

2. Write a Java program that can take a positive integer greater than 2 as input and write out the number of times one must repeatedly divide this number by 2 before getting a value less than 2.

3. Write a Java program that outputs all possible strings formed by using the characters 'c', 'a', 'r', 'b', 'o', and 'n' exactly once.

4. Write a Java program that takes all the lines input to standard input and writes them to standard output in reverse order. That is, each line is output in the correct order, but the ordering of the lines is reversed.

5. Write a Java method, *isOdd*, that takes an int *i* and returns true if and only if *i* is odd. Your method can't use the multiplication, modulus, or division operators, however.

6. Write a Java method for finding the smallest and largest numbers in an array of integers and compare that to a java method that would do the same thing.

7. Write a Java method that takes an array of int values and determines if there is a pair of distinct elements of the array whose product is odd.

8. Write a Java program that takes two arrays a and b of length n storing int values, and returns the dot product of a and b. That is, it returns an array c of length n such that c[i] = a[i] · b[i], for i = 0, . . . , n − 1.

9. Create a class *Student* with instance variables *name, roll, mark* and instance methods *setData(), display()*. Write a Java program to create three objects of Student class to input details of three different students and display the details. Enclose *main()* method inside another class *StudentDetails*. (Use the setter method *setData()* to input details.)

10. Rewrite question 9 with instance method *setData(String,int,double)*. Use the setter method *setData()* to initialize members.

11. Create a class *Point* with instance variables *x, y* to represent co-ordinates of point and instance method *setPoint()*. Write a Java program to find distance between two points using a method *findDistance(Point,Point)*.

12. Write a Java class *Flower* that has three instance variables of type *String*, i*nt,* and *float*, which respectively represent the name of the flower, its number of petals, and price. Your class must include a method that initializes each variable to an appropriate value, and your class should include methods for setting the value of each type, and getting the value of each type.

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