

## **Java Programming Assignments**

1. Write a program in Java to check whether a number is Buzz or not.  
**Example:** A number is said to be Buzz Number if it ends with 7 or is divisible by 7.  
Example: 1007 is a Buzz Number.
2. Write a Java program to generate all combinations of 1, 2 and 3 without repetition using loop.
3. Write a program in Java which will print True if elements in an array can be rearranged to form a consecutive list of numbers where each number appears exactly once, otherwise return false.  
**Example:** Input array [4,2,1,3], Output: True  
                  Input array [5,2,1,3], Output: False  
                  Input array [3,2,1,3], Output: False
4. Write a class, Grader, which has an instance variable, score, an appropriate constructor and appropriate methods. A method, letterGrade() that returns the letter grade as O/E/A/B/C/F. Now write a demo class to test the Grader class by reading a score from the user, using it to create a Grader object after validating that the value is not negative and is not greater than 100. Finally, call the letterGrade() method to get and print the grade.
5. Write a class, Commission, which has an instance variable, sales; an appropriate constructor; and a method, commission() that returns the commission. Now write a demo class to test the Commission class by reading a sale from the user, using it to create a Commission object after validating that the value is not negative. Finally, call the commission() method to get and print the commission. If the sales are negative, your demo should print the message "Invalid Input".
6. Create a general class ThreeDObject and derive the classes Box, Cube, Cylinder and Cone from it. The class ThreeDObject has methods wholeSurfaceArea( ) and volume ( ). Override these two methods in each of the derived classes to calculate the volume and whole surface area of each type of three-dimensional objects. The dimensions of the objects are to be taken from the users and passed through the respective constructors of each derived class. Write a main method to test these classes.
7. Write a program to create a class named Vehicle having protected instance variables regnNumber, speed, color, ownerName and a method showData ( ) to show "This is a vehicle class". Inherit the Vehicle class into subclasses named Bus and Car having individual private instance variables routeNumber in Bus and manufacturerName in Car and both of them having showData ( ) method showing all details of Bus and Car respectively with content of the super class's showData ( ) method.

8. Write a Java program which creates a base class Num and contains an integer number along with a method shownum() which displays the number. Now create a derived class HexNum which inherits Num and overrides shownum() which displays the hexadecimal value of the number.
9. Write a program that reads ten integers, computes their average, and finds out how many numbers are above the average. [Use this keyword]
10. Create an abstract class Accounts with the following details: Data Members: (a) Balance (b) accountNumber (c) accountHoldersName (d) address Methods: (a) withdrawl()- abstract (b) deposit()- abstract (c) display() to show the balance of the account number Create a subclass of this class SavingsAccount and add the following details: Data Members: (a) rateOfInterest Methods: (a) calculateAmount()
11. Create an interface called Player. The interface has an abstract method called play() that displays a message describing the meaning of "play" to the class. Create classes called Child, Musician and Actor that all implement Player. Create a suitable class that demonstrates the use of the classes.
12. Implement the following in Java.  
Create a package named Shapes. Create some classes in the package representing some geometric shapes like Circle, Triangle, Rectangle etc. The classes should contain Area() and Perimeter() methods in them. Use this package to compute area and perimeter of different shapes chosen by the user.
13. Write a program that takes a value at the command line for which factorial is to be computed. The program must convert the string to its integer equivalent. There are three possible user input errors that can prevent the program from executing normally. The first error is when the user provides no argument while executing the program and an ArrayIndexOutOfBoundsException is raised. You must write a catch block for this. The second error is NumberFormatException that is raised in case the user provides a non-integer (float double) value at the command line. The third error is IllegalArgumentException. This needs to be thrown manually if the value at the command line is less than 0.
14. Create two user-defined exceptions named "TooHot" and "TooCold" to check the temperature (in Celsius) given by the user passed through the command line is too hot or too cold. If temperature > 35, throw exception "TooHot". If temperature < 5, throw exception "TooCold". Otherwise, print "Normal" and convert it to Fahrenheit.
15. Write a program which handles Push and Pop operations of a stack concurrently [use thread].
16. Write a program to delete all repeated words in a sentence.

17. Write a program to search last occurrence of a substring in a string.
18. Write a program to display the characters in prime positions in a given string.
19. Write a program to check whether a number is perfect or not. Number should be taken through user input (Using Scanner or BufferedReader).  
[**Perfect number** is a positive integer that is equal to the sum of its proper divisors. The smallest perfect number is 6, which is the sum of 1, 2, and 3.]
20. Write a Java AWT program which will create a basic registration form of your choice using various components.
21. Write a Java Swing program which will create an admission form of your choice using various components. Incorporate the admission form in a menu (Admission -> New Form), if possible. Admission menubar have two options New Form and Exit with a separator.
22. Write a program will show different database operations using JDBC.