OOPS with Java Assignment - 1

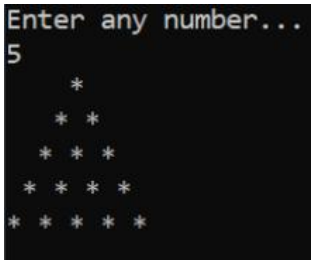
1. Design a Java program to get a number from user and find the given number is positive or negative. Display the message.
2. Write a Java program to calculate a Factorial of a number
3. Write a Java program to get the age of a person and find the age group of that person as

Age	Category
0-3	Toddlers
4-8	Kids
9-12	Child
13-18	Teens
19 – 40	Adults
41- 60	Matured Adults
61 – 75	Seniors
>76	Super Seniors

4. Write a program called CozaLozaWoza which prints the numbers 1 to 110, 11 numbers per line. The program shall print "Coza" in place of the numbers which are multiples of 3, "Loza" for multiples of 5, "Woza" for multiples of 7, "CozaLoza" for multiples of 3 and 5, and so on.

   The output shall look like:
   1 2 Coza 4 Loza Coza Woza 8 Coza Loza 11
   Coza 13 Woza CozaLoza 16 17 Coza 19 Loza CozaWoza 22
   23 oza Loza 26 Coza Woza 29 CozaLoza 31 32 Coza

5. Write a Java code to get a number and find whether it is prime number or not. (note:Prime number is the number divisible by 1 and itself only)
6. Design a Java program to print the following pattern for the positive value ‘n’.
   Sample Output



7. Write a Java program that will read in month and day (as numerical value). The program will return the equivalent zodiac sign.

Zodiac Sign	Duration
Aquarius	Jan 20 – Feb 18
Pisces	Feb 19 – Mar 20
Aries	Mar 21 – Apr 19
Taurus	Apr 20 – May 20
Gemini	May 21 – Jun 20
Cancer	Jun 21 – Jul 22
Leo	Jul 23 – Aug 22
Virgo	Aug 23 – Sep 22
Libra	Sep 23 – Oct 22
Scorpio	Oct 23 – Nov 21
Sagittarius	Nov 22 – Dec 21
Capricorn	Dec 22 – Jan 19

Sample output:
Enter month: 6
Enter day: 25
Zodiac sign for June 25 is Cancer

8. Write Java code statements that accomplish the tasks listed below
   a) Declare an array of integers.
   b) Allocate storage to allow 5 integers to be stored in the array.
   c) Populate the array with the values: 1, 8, 27, 64, 125
   d) Replace the third array element with the value -7.
   e) Copy the value of the fifth array element to the first array storage location.
   f) Subtract the value stored in the second array storage location from the value stored in the third and store the difference in the fourth array storage location.
   g) Compute the sum of the array elements with subscripts 1 to 3.
9. Design a Java code to receive input for 'n' numbers and sort numbers based on user's choice either ascending or descending. Finally print results
10. Design a Java program to get a string and do the following in the same program.
    1) Get a character. Find the occurrence of the character from right and left side. Display that information separately.
    2) Get a positive integer from user and find the character of the index such that should not create run time error.
11. Design a Java program to get 'n' numbers and a number. Apply the linear search and binary search. Find the best algorithm through the computation and display the result.
12. Design a Java Program to get a matrix as input and print the transpose of the given matrix.
13. Develop a Java program to get a matrix and print the lower triangle of the matrix.
    Apply the necessary conditions if it required.
    Sample output:

```
Enter the no.of rows in matrix...
3
Enter no.of cols in the matrix...
3
Enter the elements in the matrix...
1 2 3 4 5 6 7 8 9
Matrix entered by the user...
1 2 3
4 5 6
7 8 9
Lower triangular matrix:
1 0 0
4 5 0
7 8 9
```

14. Get 'n' integer numbers from user and find the count of each unique number.
    Display the result as number – its count.
    Example: 3 - 5, where 3 is the number presented for 5 times)
15. Write a Java program to get a string from user. Divide the given string into 5 equals parts and make those part as new string. At last, print all information. Apply the necessary conditions
16. Design a Java Program to represent time as class which contains the following:
    a. Hours, minutes and seconds as members.
    b. Basic Methods to get input, print the time.
    c. Method to find the difference between two times.
17. Demonstrate these methods through few objects. Also apply the necessary conditions
    Sample Output:

```
Starting Time
Enter the hours, minutes and seconds:
08 67 34
Invalid Input
Enter the hours, minutes and seconds:
08 57 34

Ending Time
Enter the hours, minutes and seconds:
10 58 35

Starting Time:
8:57:34
Ending Time:
10:58:35

Time Difference:
2:1:1
```

OOPS with Java Assignment - 1

18. Design a Java program with your choice of a class to represent any real-world object. Illustrate *constructors* and *this* keyword.
19. Design a Student class which contains register number, name, marks for three courses, average and result. Define methods to get input, print details, find the average and result (if mark is more than 49 in all courses then Pass, otherwise Fail).
    Keep input methods and print methods as public while others are private.
    Create array of objects for the Student class and demonstrate those methods
20. Design a class to store account details of a person like account number, name, account type, available balance and minimum balance. Define methods to get input, display account details, show balance, deposit and withdraw.
21. Apply the condition while withdraw money from account that the minimum balance to be maintained.
22. Create a demo class in Java to demonstrate these methods with minimum of 3 objects
    Using loop statement write a program that prompts the user to enter 5 integer values:
    i. Find and display the Largest and Smallest number
    ii. Display whether the number is Even or Odd
    iii. Display whether the number is negative, positive or zero
    iv. Calculate the Sum and Average of the Even numbers
23. Write a program that randomly generates an integer between 0 and 100, inclusive. The program prompts the user to enter a number continuously until the number matches the randomly generated number. For each user input, the program tells the user whether the input is too low or too high, so the user can choose the next input intelligently.
24. Write a class named Duplicate that use a method named..... long duplicateDigits(long n) that, given a long integer n that is here guaranteed to be positive, returns the integer constructed by writing its digits twice in a row.
    For example, when called with argument 1504, this method would return 15041504. You may not convert n to a string at any time, but must calculate the answer using only loops, conditions and basic integer arithmetic.
    Your method must work correctly for all positive values of n less than one million.
    (Hint: think of how you would check whether n consists of one digit, and how you would calculate the duplicated number in such case. Then think of two digits, three digits, four digits and higher until you can see and can implement the general pattern.)
25.

Computing Mean and Standard Deviation: Write a java program that computes the standard deviation of numbers. You may use a different but equivalent formula to compute the standard deviation of n numbers.

$$\text{Mean} = \frac{\sum_{i=1}^{n} x_i}{n} = \frac{x_1 + x_2 + x_3 + \ldots\ldots + x_n}{n}$$

where x_i are the ndividual values of data
n is the sample size or number of values

Formula to estimate sample standard deviation

$$\text{deviation} = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \text{Mean})^2}{n-1}}$$

Program should prompt the user to enter ten numbers and displays the mean and standard deviation, as shown in the following sample run:

```
Enter ten numbers: 2.9 1.5 2 6 5 3.3 4.2 7.7 5 4
The mean is :
The standard deviation is:
```