

Programming Assignment-IV

(JAVA)

(Iterative Statements/Looping)

1. Write a java program that gets three integers from the user. Count from the first number to the second number in increments of the third number. Use a for loop.

Count from: 4

Count to: 13

Count by: 3

Output: 4 7 10 13

2. Write a java program that, using one for loop and one if statement, prints the integers from 1,000 to 2,000 with five integers per line. (Hint: Use the % operation).

3. If we list all the natural numbers below 10 that are multiples of 3 or 5, we get 3, 5, 6 and 9. The sum of these multiples is 23. Write a java program to find the sum of all the multiples of 3 or 5 below 1000.

4. Write a java program to find the difference between the sum of the squares and the square of the sum of the first N natural numbers. (N is the key board input value).

The sum of the squares of the first ten natural numbers is, $1^2 + 2^2 + \dots + 10^2 = 385$

The square of the sum of the first ten natural numbers is, $(1 + 2 + \dots + 10)^2 = 55^2 = 3025$

Hence the difference between the sum of the squares of the first ten natural numbers and the square of the sum is $3025 - 385 = 2640$.

5. Write a java program to print the following pattern using nested loops.

```
* * * * * * * * * * 1
* *      *      *      *      * 2
*      *      *      *      * 3
* *      *      *      *      4
*      *      *      *      * 5
* * *      *      *      *      6
*      *      *      *      * 7
* *      *      *      *      8
*      *      *      *      * 9
* *      *      *      *      10
```

6. Write a java program to compute the harmonic mean. The harmonic mean is defined by

$$H = \frac{n}{\sum_{i=1}^n (1/a_i)}$$

7. Write a java program to compute the sum of the first n terms ($n \geq 1$) of the series.

$$S = 1 - 3 + 5 - 7 + 9 - \dots$$

8. Input a number n, write a java program to compute n factorial (written as n!) where $n \geq 0$.

9. For a given x and a given n, write a java program to compute $x^n/n!$.

10. Write a java program to generate and print the first n terms of the Fibonacci sequence where $n \geq 1$. The first few terms are: 0, 1, 1, 2, 3, 5, 8, 13,

11. Write a java program to generate and print the first n terms of the Fibonacci numbers using an efficient algorithm. In this case, you need to find a pair of Fibonacci terms, in each iteration and display them and adjust the preceding term b and the term before the preceding term a. Your program should handle all positive values of n.

Example:

If $n=10$, it will display as: Fibonacci Series is: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34

If $n=11$, it will display as: Fibonacci Series is: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55

12. Write a java program that accepts a positive integer n and reverses the order of its digits.

13. Write a java program that puts the binary representation of a positive integer N into a String s.

14. Write a java program GCD that finds the greatest common divisor (gcd) of two integers using Euclid's algorithm, which is an iterative computation based on the following observation: if x is greater than y, then if y divides x, the gcd of x and y is y; otherwise, the gcd of x and y is the same as the gcd of $x \% y$ and y.

15. Write a java program to find the sum of the first n terms of the series

$$fs = 0! + 1! + 2! + 3! + \dots + n! \quad (n \geq 0)$$

16. Write a java program to compute the sum of the digits in an integer.

17. A perfect number is one whose divisors add up to the number. Example: The first perfect number is 6. because 1, 2, and 3 are its proper divisors, and $1+2+3=6$

Write a java program that prints all perfect numbers in between 1 and 500.