

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

ROORKEE – 247 667

(Autumn Semester 2016 – 17)

Fundamentals of Object Oriented Programming (CSN 103)

Assignment 2

- 1 Write a JAVA program which asks the user to supply an alphabet in lower case from the key board. Then convert the alphabet in upper case.
- 2 Write a JAVA program to display the names of the Months of the year, depending upon the number entered by the user using:
 - (i) if – else
 - (ii) switch – case
- 3 Read a positive integer value, and compute the following sequence: If the number is even, halve it; if it's odd, multiply by 3 and add 1. Repeat this process until the value is 1, printing out each value. Finally print out how many of these operations you performed. Write a JAVA Program.
- 4 Write a JAVA program to find the sum of the following series using
 - (a) for loop (b) while loop and (c) do-while loop
 - I. $\text{Sum} = 1 + 5 + 10 + 15 + \dots + n$
 - II. $\text{Sum} = 1 - \frac{1}{1!} + \frac{2}{2!} - \frac{3}{3!} + \frac{4}{4!} - \dots$
 - III. $\text{Sum} = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \dots - \frac{x^n}{n!}$
 - IV. $\text{Sum} = 1^2 + 2^2 + 3^2 + \dots + n^2$
 - V. $\text{Sum} = 1^3 - 3^3 + 5^3 - \dots n^3$
- 5 Write a JAVA program to simulate a calculator where the user enters two integer numbers and an operator (+, -, *, /, %). The program then carries out the specified operation and displays the result. Write using if statement as well as switch statement.
- 6 Write a JAVA program to display the table of a given number.
- 7 Write a JAVA program to check for palindromes for Integers as well as string using(For example *1221*, *57866875* and *avon sees nova* are some palindromes):
 - (i) if – else
 - (ii) switch – case
- 8 Write a JAVA program to find the maximum and minimum of n numbers using:
 - (a) for loop (b) while loop and (c) do-while loop
- 9 Write a JAVA program to check if given two numbers are relatively prime or not.
- 10 Write a JAVA program to find the perfect numbers between 1 to 100000. m is a perfect number if $\sigma(m) = 2m$, that is if m is the sum of all its positive divisors other than itself.

 $\sigma(m)$ - sum of the positive divisors of m . For example $\sigma(12) = 1 + 2 + 3 + 4 + 6 + 12 = 28$ where 1, 2, 3, 4, 6 and 12 are the positive divisors of 12.
For example 28 is a perfect number $\sigma(28) = 1 + 2 + 4 + 7 + 14 + 28 = 56$
- 11 Write a JAVA program to generate Hemachandra series, 1, 2, 3, 5, 8, 13, 21...