JAVA and Network Programming

Assignment-2

1. Write a value-returning method, **classifyChar** that returns a value indicating whether a given character is a vowel, consonant, special or numeric in a class. In **main()** method within different class accept a string from user and count number of vowel, consonant, special and numeric character in that string.

2. Write a Java Program with two classes. The class named **CountCharFrequency** contains a method, **countDisplayCharFrequency()** which counts and displays the number of occurrences of each character in a given text string. In **main()** method within different class accept a string from user and pass it to the **countDisplayCharFrequency()** method.

3. Write a Java program to determine whether a given square matrix has the following properties or not: (a) diagonal (a square matrix is a diagonal matrix in which non-diagonal elements are zeroes) and (b) symmetric (a matrix is a symmetric matrix if $A=A^T$). You should write methods named ***isDiagonal()*** and ***isSymmetric()*** in a class named ***MatProperties*** that will return Boolean variable for determining and displaying the above matrix properties.

4. A nonnegative integer is called a palindrome if it reads forward and backward in the same way. For example, the numbers 5, 121, 3443, and 123454321 are palindromes. Write a method in a class that takes as input a nonnegative integer and returns true if the number is a palindrome; otherwise, it returns false. Also write a program to test your method in **main()** method within a different class that will display all palindrome numbers in range (e.g., 1 to 9999999).

5. Write a Java program to determine whether a given square matrix has the following properties or not: (a) scalar (principal diagonal elements are all equal and off-diagonal elements are all 0) and (b) skew-symmetric (a matrix is a skew-symmetric matrix if $A=-A^T$). You should write methods named ***isScalar()*** and ***isSkewSymmetric()*** in a class named ***MatProperties*** that will return a Boolean variable for determining and displaying the above matrix properties.

6. A positive integer is called a *perfect number* if it is equal to the sum of all of its positive divisors, excluding itself. For example, 6 is the first perfect number because **6 = 3 + 2 + 1**. Write a program to find all perfect numbers in the range 1 t0 10000.

7. Typical format for a mobile phone number in Bangladesh is 0XXNNNNNNNN, e.g. 01154694200 when dialed inside Bangladesh, and +880XXNN NNNNNN when dialed internationally. Write a program to determine whether a given Bangladeshi mobile number is valid or not. For example, 01754616166, +8801754616266 are valid mobile numbers. However, 017388080, +8101754616266, +9101754616266 are invalid mobile numbers. Also classify the

mobile network operator based on the given number. XX indicates the mobile network operator code:

11 - Citycell

13 and 17 - Grameenphone

14 and 19 - Banglalink

15 - TeleTalk

16 and 18 - Robi