Homework3:

Submit your work (the .java source code files ONLY, not the compiled .class files!) through the "Homework3" link on Brightspace. You may submit an unlimited number of times; we will only grade the last/latest submission attempt, but be sure to attach all of your files to each submission attempt. Be sure to include your name and Stony Brook ID number in a comment at the beginning of each file that you submit.

Due: Friday, October 25, 11:59pm   Total: 25 points (5 points per problem)

Submission Instructions: **Name your java classes for this assignment as**:

>   **Problem1: Palindome.java**
>   **Problem2: Emirp.java**
>   **Problem3: Anagram.java**
>   **Problem4: DecimalToBinary.java**
>   **Problem5: BinaryToDecimal.java**

1. Write a method that checks whether the input string or a sentence (a string with spaces) is a palindrome or not. The method should be case insensitive and should ignore spaces. Write a test program that prompts the user to input a string and invokes this method. Some example runs are:

    Enter the input string: madam
    Input string madam is a palindrome

    Enter the input string: banana
    Input string banana is NOT a palindrome

    Enter the input string: Race Car
    Input string Race Car is a palindrome

    Enter the input string: Too   HOT to hoot
    Input string Too   HOT to hoot is a palindrome

2. An emirp (prime spelled backward) is a non-palindromic prime number whose reversal is also a prime. For example, 17 is a prime and 71 is a prime, so 17 and 71 are emirps. Write a program that displays the first 100 emirps. Display 10 numbers per lie, separated by exactly one space, as follows:
    13 17 31 37 71 73 79 97 107 113 149 157 167 179 199 311 337 347 359 389 …

You need to define and use two additional methods to check for the non-palindrome and prime conditions. Do not write the complete program in the main method.

3. Two strings are anagrams if they are written using the same exact letters. Write a method to check if given two strings are anagrams or not. You have to ignore the case and space characters. Write a test program for that prompts the user to input two strings and invokes this method. Some example runs are:

   Enter the first string: abbacba
   Enter the second string: abcabba
   abbacba and abcabba are anagrams

   Enter the first string: banana
   Enter the second string: cabana
   banana and cabana are NOT anagrams

   Enter the first string: Eleven plus two
   Enter the second string: Twelve plus one
   Eleven plus two and Twelve plus one are anagrams

4. Write a method that converts a decimal number into a binary number as a string. The method header is:

   public static String dec2Bin(**int** value)

   Write a test program that prompts the user to enter a decimal number and displays its binary equivalent.

5. Write a method that parses a binary number as a string and converts it into a decimal integer. The method header is:

   public static int bin2Dec(**String** binaryString)

   Write a test program that prompts the user to enter a binary number as a string and displays its decimal equivalent.