**Lab Assignment – 6  
Total Points: 100**

**Due Date: Feb 27th, (Friday), 11.59 pm**

**Objective: In this lab assignment you will be implementing recursive methods and demonstrate their working.**

1. A palindrome is a string that reads the same forward or backward. Examples of palindromes include *bob, dad, deed, malayalam* (a language spoken in Kerala state of India) and *level*. Design and describe a recursive algorithm using ***pseudo code*** to test whether a given string is a palindrome. Provide the running time of this algorithm.
2. Isabel has an interesting way of summing up the values in an array A of n integers, where n is a power of two. She creates an array B of half the size A and sets,

*B[i] = A[2i] + A[2i + 1] for I = 0,1, ….., (n/2) – 1.*

If *B* has size *1,* then she outputs *B[0].* Otherwise she replaces *A* with *B*, and repeats the process. Design an algorithm that represents Isabel’s technique and describe it using pseudo code. Finally state the running time of her algorithm.

**Create a NetBeans project named lab06 and ensure it is saved to a location like desktop or your flash drive. In the project you will do the following:**

1. Write a Java class named *PalindromeTest.* Do the following in the class:
   1. Implement the algorithm you designed in step 1 as a static method named *isPalindrome(String).*
   2. Provide a *main( )* method in the same class and do the following.
      1. Prompt the user to input a String
      2. Call the *isPalindrome( )* method to answer the question if the input string is a palindrome.
      3. Use the examples of palindromes provided to check whether they are palindromes.
      4. Test also for some non-palindrome strings.
      5. Print the results on the output window using text.
2. Write a Java class named *IsabelTechnique*. Do the following in the class:
   1. Implement the algorithm you designed in step 2 as a static method named *sumValues(int[])* which will return the sum of values of the integers in an array.
   2. Create an *int* array of appropriate size greater than 10 as defined in the algorithm. Populate the array with random values between 1 and 10.
   3. Call the *sumValues( )* method to display the total.

**Things to turn in:**

* Open a Microsoft Word document name using the following file naming convention
  + i.e. *lab06-LnameFM*
    - lab06 = assignment prefix
    - Lname = your last name
    - F = your first initial
    - M = your second initial
* Type your answer to task 1
* Type your answer to task 2
* Copy and Paste the source code of the *PalindromeTest class*
* Copy and Paste the output of the *PalindromeTest* ***class***
* Copy and Paste the source code of the *IsabelTechnique* class.
* Copy and Paste the output of the *IsabelTechnique*class.
* Create a screen capture of your NetBeans IDE that includes the contents of the Output Windows from both the programs and paste it into your Word document below your source code.
  + To create a screen capture of your NetBeans IDE
    - Select, left-click in the NetBeansIDE
    - Use Alt-PrintScreen to place an screen capture image on the clipboard
    - Use Ctrl-V to paste the contents of the clipboard into your Word document
* Next, zip the Project folder.
* Finally on blackboard, submit both your Word document and project zipped file using separate uploads but in one submission.