Lesson 4 – Recursion - Lab Homework

Find the solutions for the given problem using recursive approach.

1. For this exercise, you will write your own exponential function. Use the fact that for any (real number) *x* and any natural number *n* > 0,

$$x^n = x * x^{n-1}$$

write a recursive function

double power (double x, int n)

that returns x^n and that uses only multiplication (and addition and subtraction if necessary) for its computation. (For this exercise, do **not** use the Math function pow(x,n).) Enclose the function in a class called Exponential.

Demonstrate that your method works by doing the following: In the main method, create an instance of Exponential, and, from this instance, call power(2,10), and print the result to the console.

2. Using recursion to find the minimum character in the given string input.

   If your input is "akel" in return 'a'

3. Perform Recursive Binary Search for the int[] array of inputs.

   Binary Search Algorithm – Your input should be in sorted order either supply a sorted input or use Arrays.sort to arrange the elements is the natural order.

   if the array is empty

   return –1 as the search result

   else if the middle element matches the target

   return the subscript of the middle element as the result

   else if the target is less than the middle element

   recursively search the array elements before the middle element

   and return the result

   else

   recursively search the array elements after the middle element and

return the result

4. Perform unit testing for any two problems from Problem 1 to 3.