Assignment Presentation - 1

1. Write a recursive function to calculate the power of a given number (x^n), where both x and n are integers.

2. Implement a function that accepts a string and returns a dynamically allocated array of characters containing the unique characters in the string, sorted in ascending order.

3. Write a function that accepts a two-dimensional array of integers and returns the transpose of the array (rows become columns and vice versa).

4. Write a function that accepts a string and returns the longest palindrome substring in the string.

5.Implement a recursive function to solve the Tower of Hanoi problem with n disks, given three towers.

6. Write a function that accepts a two-dimensional array of integers and returns the largest square submatrix that consists of only 1s.

7. Write a function that accepts a pointer to a string and removes all the vowels from the string, modifying it in-place.

8. Create a function that accepts two dynamically allocated arrays of integers and merges them into a new sorted array. The function should return a pointer to the merged array, and it should handle the deallocation of the input arrays.

9. Write a function that accepts a pointer to a 2D array of integers and rotates the array 90 degrees clockwise in-place.

10. Create a function that accepts a pointer to a 2D array of floating-point numbers and calculates the average value of each column, storing the results in a dynamically allocated 1D array. The function should return a pointer to the resulting array.