❖ ASSIGNMENT NUMBER 2:

	Objective: The goal of this assignment is to analyse and compare the performance of different algorithms based on their time and space complexity. You will also solve recurrence relations and evaluate the average case time complexity using probabilistic methods.	**CO**	**BL**
Q.1	**Implement and Analyze Time and Space Complexity** **Implement two different sorting algorithms Bubble sort and Quick Sort.** • **Measure and compare their execution time for different input sizes (e.g., n = 100, 1000, 5000, 10000).** • **Calculate and compare the space complexity of these algorithms. Plot graphs showing time complexity trends.** • **Deliverables: code in C++ language for all sorting algorithms.**		
Q.2	**Asymptotic Notations (O, Ω, Θ)** **Write a simple program that compares three functions:** • **Print their computed values for increasing values of and classify them under O, Ω, and Θ notations.** • **Deliverables: C++ code for function comparison.**	**CO2**	**BL3**
Q.3	**Solving Recurrence Relations** **Solve the following recurrence relations using:** • **Recursion-tree method** • **Master method** • **Substitution method** **a)** $T(n) = 2T(n/2) + n$ **b)** $T(n) = T(n/2) + 1$ • **Deliverables: Step-by-step solutions for recurrence relations. C++ code implementation.**	**CO2**	**BL3**