Foundations & Data Structures With C++

Assignment 8 – Recursion 2

Note : Do all questions recursively

1. Implement Binary Search.
2. Implement Merge Sort.
3. Given a String return all the subsequences.

   For e.g. Input : “abc”
   Output : “”, a, b, c, ab, ac, bc, abc
4. Print all permutations of a given string.
5. Assume that value of a=1, b=2, c=3, d=4, ... z=26. You are given a numeric string S. Write a program to find and print list of all possible codes that can be generated from the given string.

   For e.g. Input : “1123”
   Output : aabc, kbc, alc, aaw, kw
6. Return all subsets of an array
   a. Instead of returning print all these
7. Given an array find all subsets of A, which sum to K.
8. Suppose you have a string made up of only the letters 'a' and 'b'. Write a recursive function that checks if the string was generated using the following rules -
   a. the string begins with an 'a'
   b. each 'a' is followed by nothing or an 'a' or "bb"
   c. each "bb" is followed by nothing or an 'a'
9. Using the phone keypad, return all possible words that can be produced given input digits. For e.g. 23 --> “ad, ae, af, bd, be, bf, cd, ce, cf”
   a. Instead of returning print all these
10. A child is running up a staircase with n steps, and can hop either 1 step, 2 steps or 3 steps at a time. Implement a method to count how many possible ways the child can run up to the stairs.