Question 1 Write a single C program with the following functions.

- Without using built-in C library functions for strings, write a recursive function that will print a string of characters one by one in all capitals (no matter what the case of the original letter is). You are also not able to use a switch or an if statement to decide if the letter is capital or not. To do this, have a look at the ASCII table.
- Write a function that reverses a string in the same memory location, without using another string variable to reverse.
- Write a function to insert a string into another string. Your function will insert the string `s2` in the string `s1` immediately following the `kth` character in `s1`. If `k` is 0, `s2` is inserted before the first character in `s1`. If `n` is greater than the number of characters in `s1`, `s2` is inserted after the last character in `s1`.
- Write a function to calculate the length of the longest common subsequence of two given strings. The strings consist of alphabetical characters but the string does not have to be in any given language; thus a valid string could be “hrtyasdfklanfjk”.
- Write a function to find the longest Palindromic substring from a given string. Return the substring.
- Given a string of words (read from a file), write a function that will sort the words from longest to shortest. I do not care about efficiency here, just that it works.
- Write a function to count each character in a given string. The counts should be displayed only if their counts are non-zero.