Indian Institute of Information Technology Sri City, Chittoor

(An Institute of National Importance under An Act of Parliament)

Name: **DSA Lab - 7** Duration: **3 Hrs**

Date: **18th October, 2021** Maximum Marks: **10**

INSTRUCTIONS:

1. Please carefully read all assignment problems and complete the function prototypes given to solve the problems. **Do not change the function prototypes.**

2. **Write only a single main function**. You can call the required functions from the main function with static input or input provided by the user. **Do not ask for any user input within the functions**.

3. Name the file as follows: S2020xxxxx_A7.c

4. DO NOT zip. Upload a single .c file directly to your submission in the common Google classroom.

If you do not follow the above-mentioned instructions, a strict penalty would be imposed.

ASSIGNMENT PROBLEMS

1. Write a program to implement and manipulate a trie data structure. Define a structure Trie_Node that has three data members in it - a list of pointers (assume that we are only concerned with strings with lower case alphabets), an integer variable word that denotes whether the path from the root to the current node is a string present in the collection or not, and an integer variable index which denotes the index of the current word in a global array of strings (of course, the variable index only has any meaning if word = 1)
    a. Declare an array of strings, String_Set[] as a global variable (maximum size of 20).
    b. Write a function Insert_Trie(char s[]) that takes as argument a single string and inserts it into the trie. Additionally, add the newly inserted string into the next vacant position in String_Set and set the index variable in the trie accordingly. **[3 marks]**
    c. Write a function Search_Trie(char s[]) that takes a string as an argument. The function returns 1 of the string is present in the trie and returns 0 otherwise. **[2 marks]**
    d. Write a function Delete_Trie(char s[]) that takes a string as an argument and deletes that string (if it exists) from the trie. **[3 marks]**
2. You are already familiar with Inorder traversal in trees. Modify the inorder traversal algorithm and write a function Display_Trie() that displays all the strings stored in the trie. **[2 marks]**