3) (10 pts) DSN (Tries)

The word "intention" is such that four of its prefixes, "i", "in", "intent" and "intention" are words themselves. Write a function that takes in a pointer to the root of a trie storing a dictionary of words and returns the maximum number of words that are prefixes of a single word. Use the struct definition and function prototype given below.

```
typedef struct TrieNode {
    struct TrieNode *children[26];
    int flag; // 1 if the string is in the trie, 0 otherwise
} TrieNode;

int max(int a, int b) {
    if (a > b) return a;
    return b;
}

int maxNumPrefixWords(TrieNode* root) {

    if (root == NULL) return 0;                          // 2 pts
    int maxChild = 0;
    int i;
    for (i=0; i<26; i++)                                 // 2 pts
        maxChild = max(maxChild, maxNumPrefixWords(root->children[i]));
        // 4 pts, 3 pts for rec call, 1 for updating max

    return maxChild + root->flag;                        // 2 pts

}
```

Computer Science Foundation Exam

August 25, 2018

Section II A

ALGORITHMS AND ANALYSIS TOOLS

SOLUTION

NO books, notes, or calculators may be used,
and you must work entirely on your own.

Question #	Max Pts	Category	Score
1	10	ANL	
2	5	ANL	
3	10	ANL	
TOTAL	25		

You must do all 3 problems in this section of the exam.

Problems will be graded based on the completeness of the solution steps and <u>not</u> graded based on the answer alone. Credit cannot be given unless all work is shown and is readable. Be complete, yet concise, and above all <u>be neat</u>. For each coding question, assume that all of the necessary includes (stdlib.h, stdio.h, math.h, string.h) for that particular question have been made.