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// Implements a dictionary's functionality

#include <ctype.h>
#include <stdbool.h>
#include <stdio.h>
#include <string.h>
#include <strings.h>
#include <stdlib.h>

#include "dictionary.h"

// Represents a node in a hash table
typedef struct node
{
    char word[LENGTH + 1];
    struct node *next;
}
node;

// Function prototype
void word_count(node *pnode);

// TODO: Choose number of buckets in hash table
const unsigned int N = 26 * 26 * 26 * 26 ;
int count = 0;
// Hash table
node *table[N];

// Returns true if word is in dictionary, else false
bool check(const char *word)
{
    // TODO
    int hash_value = hash(word);
    node *cursor = table[hash_value];
    while (cursor != NULL)
    {
        if (strcasecmp(word, cursor->word) == 0)
        {
            return true;
        }
        cursor = cursor->next;
    }
    return false;
}
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// Hashes word to a number
unsigned int hash(const char *word)
{
    // TODO: Improve this hash function
    if ((strlen(word) == 1) | (word[1] == '\\'))
    {
        return toupper(word[0]) - 'A';
    }

    if ((strlen(word) == 2) | (word[2] == '\\'))
    {
        return (toupper(word[0]) - 'A' + 1) * (toupper(word[1]) - 'A' + 1) - 1;
    }

    if ((strlen(word) == 3) | (word[3] == '\\'))
    {
        return (toupper(word[0]) - 'A' + 1) * (toupper(word[1]) - 'A' + 1)
            * (toupper(word[2]) - 'A' + 1) - 1;
    }

    return (toupper(word[0]) - 'A' + 1) * (toupper(word[1]) - 'A' + 1)
        * (toupper(word[2]) - 'A' + 1) * (toupper(word[3]) - 'A' + 1) - 1;

    /*
    if ((strlen(word) == 4) | (word[4] == '\\'))
    {
        return (toupper(word[0]) - 'A' + 1) * (toupper(word[1]) - 'A' + 1)
            * (toupper(word[2]) - 'A' + 1) * (toupper(word[3]) - 'A' + 1) - 1;
    }
    */
    /*
    return (toupper(word[0]) - 'A' + 1) * (toupper(word[1]) - 'A' + 1)
        * (toupper(word[2]) - 'A' + 1) * (toupper(word[3]) - 'A' + 1)
        * (toupper(word[4]) - 'A' + 1) - 1;
    */
}

// Loads dictionary into memory, returning true if successful, else false
bool load(const char *dictionary)
{
    // TODO: Open file
    FILE *file = fopen(dictionary, "r");
    // Check
    if (file == NULL)
    {
        printf("Can't open %s\n ", dictionary);
    }
}
```

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}

// Read the dictionary
char word[LENGTH + 1];
while (fscanf(file, "%s", word) != EOF)
{
    // Get a memory location
    node *tmp = malloc(sizeof(node));
    if (tmp == NULL)
    {
        printf("Memory allocation error!");
        return false;
    }

    int hash_value = hash(word);
    // Add word to the linked list
    strcpy(tmp->word, word);
    tmp->next = table[hash_value];
    table[hash_value] = tmp;
}

// Check whether there was an error
if (ferror(file))
{
    fclose(file);
    printf("Error reading %s.\n", dictionary);
    unload();
    return 1;
}

// Close text
fclose(file);
return true;
}

// Returns number of words in dictionary if loaded, else 0 if not yet loaded
unsigned int size(void)
{
    // TODO :

    for (int i = 0; i < N; i++)
    {
        word_count(table[i]);
    }
}
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    return count;
}

// Unloads dictionary from memory, returning true if successful, else false
bool unload(void)
{
    // TODO
    for (int i = 0; i < N; i++)
    {
        while (table[i] != NULL)
        {
            node *tmp = table[i]->next;
            free(table[i]);
            table[i] = tmp;
        }
    }
    return true;
}

// Counting word up
void word_count(node *pnode)
{
    // Check
    if (pnode == NULL)
    {
        return;
    }

    // Recursion
    word_count(pnode->next);
    count++;
    return;
}
```