課題１

プログラミング入門Ⅱ　演習報告書

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リスト

#include <stdio.h>

#include <stdlib.h>

#include <string.h>

#include <ctype.h>

#define WORD\_LENGTH 20

struct record {

char word[WORD\_LENGTH];

int count;

struct record \*next;

};

int read\_word(FILE \*fp, char \*word);

void add\_word(char \*word);

struct record \*head = NULL;

int main(int argc, char \*argv[])

{

FILE \*fp;

char word[WORD\_LENGTH];

struct record \*p;

if (argc != 2) {

printf("missing file argument\n");

return 1;

}

fp = fopen(argv[1], "r");

if (fp == NULL) {

printf("can't open %s\n", argv[1]);

return 1;

}

while (read\_word(fp, word)) {

add\_word(word);

}

fclose(fp);

for (p = head; p != NULL; p = p->next)

printf("%s\t%d\n", p->word, p->count);

return 0;

}

int read\_word(FILE \*fp, char \*word)

{

int c;

int cur = 0;

while(1)

{

c = fgetc(fp);

if (isalnum(c) || c == '-' || c == '\'')

{

word[cur++] = (char)c;

}

else

{

if (cur == 0 && c == EOF)

return 0;

word[cur] = '\0';

return 1;

}

}

}

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void add\_word(char \*word)

{

struct record \*p = NULL, \*q = NULL, \*new = NULL;

if (word[0] == '\0') return;

for (p = head; p != NULL; p = p->next)

{

if (strcmp(word, p->word) == 0)

{

p->count++;

break;

}

}

if (p == NULL)

{

new = (struct record \*)malloc(sizeof(struct record));

if (new == NULL)

{

printf("out of memory\n");

exit(1);

}

strcpy(new->word, word);

new->count = 1;

for (p = head; p != NULL; p = p->next)

{

// p->word, word, hoge

if (strcmp(word, p->word) < 0)

break;

q = p;

}

new->next = p;

if (q != NULL)

{

q->next = new;

}

else

{

if (head != NULL)

new->next = head;

head = new;

}

}

}

実行結果

　ターミナルより”./ex5-1 ./prog2-ex5-data.txt”を実行し、正常な動作を確認した。

課題2

リスト

#include <stdio.h>

#include <stdlib.h>

#include <string.h>

#include <ctype.h>

#define WORD\_LENGTH 20

struct record {

char word[WORD\_LENGTH];

int count;

struct record \*next;

};

int read\_word(FILE \*fp, char \*word);

void add\_word(char \*word);

int compare\_by\_freq(const void \*s1, const void \*s2);

struct record \*head = NULL;

int main(int argc, char \*argv[])

{

FILE \*fp;

char word[WORD\_LENGTH];

struct record \*p;

int list\_size = 0;

struct record \*sorted = NULL;

int i = 0;

if (argc != 2) {

printf("missing file argument\n");

return 1;

}

fp = fopen(argv[1], "r");

if (fp == NULL) {

printf("can't open %s\n", argv[1]);

return 1;

}

while (read\_word(fp, word)) {

add\_word(word);

}

fclose(fp);

for (p = head; p != NULL; p = p->next)

list\_size++;

sorted = (struct record\*)malloc(sizeof(struct record) \* list\_size);

if (sorted == NULL)

{

printf("couldn't allocate memory for sorted list.\n");

return 1;

}

for (p = head; p != NULL; p = p->next)

sorted[i++] = \*p;

qsort(sorted, list\_size, sizeof(struct record), compare\_by\_freq);

for (i = 0; i < list\_size; i++)

printf("%s\t%d\n", sorted[i].word, sorted[i].count);

return 0;

}

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int read\_word(FILE \*fp, char \*word)

{

int c;

int cur = 0;

while(1)

{

c = fgetc(fp);

if (isalnum(c) || c == '-' || c == '\'')

{

word[cur++] = (char)c;

}

else

{

if (cur == 0 && c == EOF)

return 0;

word[cur] = '\0';

return 1;

}

}

}

void add\_word(char \*word)

{

struct record \*p = NULL, \*q = NULL, \*new = NULL;

if (word[0] == '\0') return;

for (p = head; p != NULL; p = p->next)

{

if (strcmp(word, p->word) == 0)

{

p->count++;

break;

}

}

if (p == NULL)

{

new = (struct record \*)malloc(sizeof(struct record));

if (new == NULL)

{

printf("out of memory\n");

exit(1);

}

strcpy(new->word, word);

new->count = 1;

for (p = head; p != NULL; p = p->next)

{

// p->word, word, hoge

if (strcmp(word, p->word) < 0)

break;

q = p;

}

new->next = p;

if (q != NULL)

q->next = new;

else

head = new;

}

}

int compare\_by\_freq(const void \*s1, const void \*s2)

{

return ((struct record\*)s2)->count - ((struct record\*)s1)->count;

}

実行結果

　ターミナルより”./ex5-2 ./prog2-ex5-data.txt”を実行し、正常な動作を確認した。