COMP1511 18s2 (webcms)

Code Examples on struct, pointers to struct, array of struct

student_recs.c

Simple example illustrating use of struct, array of struct and pointers to struct

```c
// The following is a demo version,  this release
// may be incomplete and/or incorrect
// Please watch the corresponding lecture video for clarifications.

#include <stdio.h>
#include <string.h>

#define MAX_STUDENTS 500

struct student {
    char id[10];
    double labs[5];
    double assigns[2];
    double final_exam;
    char name[50];
};

/**
    To clarify the required concepts, we intentionally
    fscanf each value of labs and asssigns using a separate statement.
    Better approach would be to use a loop structure(s) (for or while).

    Returns 1 if a sighting can be read, 0 otherwise
**/
int read_record(FILE *f, struct student *s) {

    if( fscanf(f, "%s,", s->id) != 1) {
        return 0;
    }
    if( fscanf(f, "%lf,", &(s->labs[0]) ) != 1) {
        return 0;
    }
    if( fscanf(f, "%lf,", &(s->labs[1]) ) != 1) {
        return 0;
    }
    if( fscanf(f, "%lf,", &(s->labs[2]) ) != 1) {
        return 0;
    }
    if( fscanf(f, "%lf,", &(s->labs[3]) ) != 1) {
        return 0;
    }
    if( fscanf(f, "%lf,", &(s->labs[4]) ) != 1) {
        return 0;
    }

    if( fscanf(f, "%lf,", &(s->assigns[0]) ) != 1) {
        return 0;
    }
    if( fscanf(f, "%lf,", &(s->assigns[1]) ) != 1) {
        return 0;
    }
    if( fscanf(f, "%lf,", &(s->final_exam) ) != 1) {
        return 0;
    }

    fgetc(f);
    if (fgets(s->name, 49, f) == NULL) {
        return 0;
    }

    // finish string at '\n' if there is one
    char *newline_ptr = strchr(s->name, '\n');
    if (newline_ptr != NULL) {
        *newline_ptr = '\0';
    }

    // also finish string at '\r' if there is one - files from Windows  will
    newline_ptr = strchr(s->name, '\r');
    if (newline_ptr != NULL) {
        *newline_ptr = '\0';
    }
```

```
    return 1;
}



int read_data_file(char filename[], struct student sa[],  int len) {

    FILE *f = fopen(filename, "r");
    if (f == NULL) {
        fprintf(stderr,"error: file '%s' can not open\n", filename);
        return -1;
    }

    int count = 0;
    while ( (read_record(f, &sa[count]) == 1) && (count < len) ){
        count = count + 1;
    }

    fclose(f);

    return count;
}


void  print_names(struct student sa[],  int size){
    int i = 0;
    for(i=0; i< size; i++){
        printf("%d) %s\n", i, sa[i].name);
    }

}

int main(int argc, char *argv[]) {
    if (argc != 2) {
        fprintf(stderr, "Usage: %s <file>\n", argv[0]);
        return 1;
    }

    struct student student_array[MAX_STUDENTS];

    int no_students = read_data_file(argv[1], student_array,  MAX_STUDENTS);

    print_names(student_array,  no_students);

    printf("\n\nno_students = %d\n", no_students);

    return 0;
}
```