

Programming Assignment #4 - Commands, Sorted List, Separate C file(40 pts)

This assignment is similar to #3 except

- You must sort the Courses List. Print it before sorting, after sorting, and after all the students have been processed.
- Instead of a student registration file, we will have a **command** file.
- You will be provided with a driver program (cs1713p4Driver.c) (see below)
- Your code must be created in a separate C file (cs1713p4.c). (see below)
- There is a new include file, cs1713p4.h
- The output is different due to the driver printing the commands as they are encountered. Please see the sample output.

Input:

Course same as Programming Assignment #3 although there may be different data.

Command This is different from the previous assignment. The file contains text in the form of commands.

```
STUDENT BEGIN szStudentId cGender szBirthDt szFullName
              specifies the beginning of student and includes all the identification
              information from program 3.
STUDENT INFO  szMajor, szEmail, dGpa, cInt1
              specifies the information for a student (separated by commas)
STUDENT REQUEST szCourseId
              specifies a single course request. Steps:
              • Print the course ID
              • Lookup the course ID, If not found, print a warning (but do not
                terminate your program) and return.
              • If found, reduce the number of seats for that course by 1
              • Print the fees.
              • Accumulate the total fees for this student.
STUDENT COMPLETE
              specifies the completion of the list of course requests for a student.
              Print the total fees for this student. (Takes the place of END)
COURSE INCREASE szCourseId iQuantity
              increase the available seats for a course by the specified quantity.
COURSE SHOW szCourseId
              requests a display of a particular course. Show all of its information .
```

Driver program (green highlighting means you have done most of this previously, yellow highlighting means new functionality):

You will be provided with a driver program, cs1713p4Driver.c which

1. invokes the driver's processCommandSwitches
2. invokes your getCourses to read the original course information. You should use the addLast for this assignment.
3. invokes your printCourses to print the original course information
4. invokes your sortCourses to sort the original course information
5. invokes your printCourses to print the sorted course information
6. invokes a driver-provided processCommands which
 - reads input lines from the command file until eof:
 - prints the input line
 - determines command and subcommand

- invokes either
 - your processStudentCommand to process a STUDENT subcommand (you should be able to reuse some of your program 2 code, although you must change it)
 - your processCourseCommand to process a COURSE subcommand

7. invokes your printCourses to print the resulting course information

Your cs1713p4.c code:

- You have been furnished with skeletal code for cs1713p4.c Your code will be in the file cs1713p4.c. You must **not** place it in the cs1713p4Driver.c file.
- It does the following includes:


```
#include <stdio.h>
#include <string.h>
#include "cs1713p4.h"
```
- It must **not** include cs1713p4Driver.c within your cs1713p4.c file. Look at the notes below on **compiling**. The "link" step is where the functions you call in the driver and the functions the driver calls in your code get resolved.
- You must create the following routines (see the include file):
 - getCourses- reads and returns the courses as a linked list (most of this is in program #3)
 - printCourses - prints the course information (most of this is in program #3)
 - sortCourses - sorts the course information using an insertion sort (see your course notes)
 - searchCourses - find a course ID in the sorted course list. You will use this in your routines.
 - processStudentCommand - processes the various STUDENT commands (most of this is in program #3)
 - processCourseCommand - processes the various COURSE commands

Please review the cs1713p4.h include file.

Compiling:

- (Before doing these steps, make a copy of your code called cs1713p3Saved.c in case you incorrectly type them and wipe out your .c file.) also I suggest creating a makefile so you can repeat this process easily
- Compile the driver using


```
gcc -g -c -o cs1713p4Driver.o cs1713p4Driver.c
```

(you can do this instead: gcc -g -c cs1713p4Driver.c causing it to automatically create the cs1713p4Driver.o)
- Compile your code using


```
gcc -g -c -o cs1713p4.o cs1713p4.c
```

(you can do this instead: gcc -g -c cs1713p4.c causing it to automatically create the cs1713p4.o)
- Link them together using:


```
gcc -g -o register cs1713p4Driver.o cs1713p4.o
```

Executing the p4 executable:

```
register -c p4Command.txt -f p4Courses.txt
```

Turn in:

Your include file (if it changed)

Your C code

Your output based on the data provided.

Initial Courses

```
***** Courses *****
Course ID      Room Number  Days      Times      Seats Fees
HIS1043.002    MH2.102    MWF       1:00-1:50pm 120  35.00
GEO1013.005    MB1.101    TR        12:30-1:45pm 5   35.00
MAT1214.003    MS1.02.03  TR        2:00-3:15pm 1   35.00
CS1713.002     NPB1.202   MWF       1:00-1:50pm 0   50.00
MAT3013.001    MS1.02.07  TR        2:00-3:15pm 1   35.00
ENG1023.001    MS1.02.07  MWF       10:00-10:50am 15  35.00
ART2113.001    AR4.01     TR        11:30-12:45pm 10  45.00
ART3023.001    AR4.04     MWF       12:00-1:50pm 7   35.00
```

Sorted Courses

```
***** Courses *****
Course ID      Room Number  Days      Times      Seats Fees
ART3023.001    AR4.04     MWF       12:00-1:50pm 7   35.00
ART2113.001    AR4.01     TR        11:30-12:45pm 10  45.00
CS1713.002     NPB1.202   MWF       1:00-1:50pm 0   50.00
ENG1023.001    MS1.02.07  MWF       10:00-10:50am 15  35.00
GEO1013.005    MB1.101    TR        12:30-1:45pm 5   35.00
HIS1043.002    MH2.102    MWF       1:00-1:50pm 120  35.00
MAT1214.003    MS1.02.03  TR        2:00-3:15pm 1   35.00
MAT3013.001    MS1.02.07  TR        2:00-3:15pm 1   35.00
```

```
STUDENT BEGIN pte357 M 1986/01/01 Pete Moss
pte357 Pete Moss (M 1986/01/01)
STUDENT INFO CS,pte357@my.uni.edu,3.20,N
CS pte357@my.uni.edu INTL:N GPA:3.20
STUDENT REGISTER HIS1043.002
STUDENT REGISTER GEO1013.005 $35.00
STUDENT REGISTER MAT1214.003 $35.00
STUDENT REGISTER CS1713.002 $35.00 not enough available seats to satisfy request
STUDENT COMPLETE
Total Fees: $70.00
COURSE INCREASE HIS1043.002 10
COURSE SHOW HIS1043.002
HIS1043.002    MH2.102    MWF       1:00-1:50pm 130  35.00
```

```
***** Courses *****
Course ID      Room Number  Days      Times      Seats Fees
ART2113.001    AR4.01     TR        11:30-12:45pm 10  45.00
ART3023.001    AR4.04     MWF       12:00-1:50pm 7   35.00
CS1713.002     NPB1.202   MWF       1:00-1:50pm 0   50.00
ENG1023.001    MS1.02.07  MWF       10:00-10:50am 15  35.00
GEO1013.005    MB1.101    TR        12:30-1:45pm 4   35.00
HIS1043.002    MH2.102    MWF       1:00-1:50pm 120  35.00
MAT1214.003    MS1.02.03  TR        2:00-3:15pm 0   35.00
MAT3013.001    MS1.02.07  TR        2:00-3:15pm 1   35.00
```