Programming Assignment #3 - Linked Lists Using Pointers (40 pts)

This assignment is like #2 except

- The Course information should be represented as a **linked list** using pointers.
- EXTRA CREDIT The course structure will now have a **waitlist** member which will track students on the waitlist for that course. When a student tries to register for a course that is full, we automatically add them to that course's waitlist.
- There is a new include file, cs1713p3.h

Input:

Courses   same as Programming Assignment #2; however, instead of placing it in an array, you will put it into an ordered linked list.

Registrations   Same as assignment 2.

Your cs1713p3.c code:
- You should probably copy your cs1713p2.c into a file named cs1713p3.c.
- It does the following includes:
    ```
    #include <stdio.h>
    #include <string.h>
    #include "cs1713p3.h"
    ```
- You must update or write the following routines *(These are suggestions to help you organize your code):*
    - printCourses - prints the course information in the list (most of this is in program #2 in array form) While printing a course you must also print the courses waitlist.
        - printWaitlist – if you're doing the extra credit this function prints the waitlist for a course, each student on the waitlist should have their Full Name, Major and student Id displayed (example output below).
    - getCourses – should now insert the course into a linked list (most of this is in program #2 in array form)
    - processRegistrations - processes the various registration requests (most of this is in program #1 in array form) While processing the registrations you must now add students to the waitlist if you're doing the extra credit.
    - a function to find a Course Id in the linked list. You will use this in your functions (most of this is in program #1 in array form).
    - a function to insert a Course into the linked list. You will use this in getCourses.
    - a function to insert a Student into a courses waitlist. You will use this in processRegistrations

Please review the cs1713p3.h include file. Most of this assignment is converting array code into linked list code, I suggest you complete all the conversions before trying to finish the new features.

Compiling:
- Compile the code using
        ```
        gcc -g -o register cs1713p3.c
        ```

Executing the p4 executable:
        ```
        register -c p3Courses.txt -s studentReg.txt
        ```

Turn in a zip file containing:

Your .h file (if it changed)
Your .c code
Your output based on the data provided.

```
*********************************** Courses ***********************************
Course ID       Room Number    Days            Times           Seats Fees
HIS1043.002     MH2.102        MWF             1:00-1:50pm     120   35.00
        Waitlist
        NONE
GEO1013.005     MB1.101        TR              12:30-1:45pm    5     35.00
        Waitlist
        NONE
MAT1214.003     MS1.02.03      TR              2:00-3:15pm     1     35.00
        Waitlist
        NONE
CS1713.002      NPB1.202       MWF             1:00-1:50pm     0     50.00
        Waitlist
        NONE
MAT3013.001     MS1.02.07      TR              2:00-3:15pm     1     35.00
        Waitlist
        NONE
ENG1023.001     MH2.202        MWF             10:00-10:50am   15    35.00
        Waitlist
        NONE
*************** Student Registration Request ***************
pte357 Pete Moss (M 1986/01/01)
CS pte357@my.uni.edu INTL:N GPA:3.20
        Courses
        HIS1043.002
        GEO1013.005
        MAT1214.003
        CS1713.002 course is full, adding (pte357) to waitlist
total fees: $105.00
*************** Student Registration Request ***************
agt352 Pop Corn (M 1957/02/02)
MAT agt352@my.uni.edu INTL:N GPA:2.80
        Courses
        MAT3013.001
        MAT3233.002 Course Id not found
        HIS1053.004 Course Id not found
total fees: $35.00
*************** Student Registration Request ***************
geh582 Penny Loafer (F 1958/03/03)
CS pennyl@xyz.net INTL:N GPA:3.50
        Courses
        MAT1214.003 course is full, adding (geh582) to waitlist
        CS1713.002 course is full, adding (geh582) to waitlist
        GEO1013.005
total fees: $35.00
*************** Student Registration Request ***************
sen233 Adam Sandler (M 1979/04/04)
ENG hgilmore@xyz.net INTL:Y GPA:2.93
        Courses
        ENG1023.002 Course Id not found
total fees: $0.00
*************** Student Registration Request ***************
fse234 Melba Toast (F 1989/05/05)
BIO butter@xyz.net INTL:N GPA:2.03
        Courses
        HIS1043.002
        GEO1013.005
        MAT1214.003 course is full, adding (fse234) to waitlist
total fees: $70.00
*********************************** Courses ***********************************
Course ID       Room Number    Days            Times           Seats Fees
HIS1043.002     MH2.102        MWF             1:00-1:50pm     118   35.00
        Waitlist
        NONE
GEO1013.005     MB1.101        TR              12:30-1:45pm    2     35.00
```

```
        Waitlist
        NONE
MAT1214.003    MS1.02.03       TR              2:00-3:15pm    0    35.00
        Waitlist
        Full Name       Major ID
        Penny Loafer    CS    geh582
        Melba Toast     BIO   fse234


CS1713.002     NPB1.202        MWF             1:00-1:50pm    0    50.00
        Waitlist
        Full Name       Major ID
        Pete Moss       CS    pte357
        Penny Loafer    CS    geh582


MAT3013.001    MS1.02.07       TR              2:00-3:15pm    0    35.00
        Waitlist
        NONE
ENG1023.001    MH2.202         MWF             10:00-10:50am  15   35.00
        Waitlist
        NONE
```