CS363 - Systems Programming
Homework 1

Due: **1 November 2019**

Rules:

- Homeworks sent after the due time will not be considered. So, finish and send in time.
- Name your C program as **cs363_hw2_surname_name.c**, where surname and name is your surname and name. Also write your name, surname and student id in a comment in your program.
- Send only one file (**cs363_hw2_surname_name.c**) by e-mail to **cs363@antalya.edu.tr**
- If your program has syntax error, you will get 0 (zero) grade. So clean the syntax errors.
- Cheating will result with a 0 (zero) grade.

Requirements:

Your C program will read data from a text file (), store them in a linked list, perform some operations on the data, and write the processed data to another text file.

An input text file contains data of students. The data for each student in the file consists of:

- student id (9 digit integer number),
- student name and surname (in a single field),
- birth date in "DD/MM/YYYY" format,
- gender ('F' for female, 'M' for male),
- department code (at most 5 characters) and
- class (int from 1 to 4).

The fields are separated by a semi colon ';'.

Your **cs363_hw2_surname_name.c** C program will do the followings:

- Declare the necessary structures.
  (The birth date will be stored as a single integer number in the YYYYMMDD format.)
- Input from user the name of the input text file.
- Read all the data which is in this text file and store in a linked list. ATTENTION: The linked list will be sorted at all times by birth date of students.
- Display all students in the linked list.
- Input a department code, and display students in that department.
- Increment by 1 the class field of all students.
- Remove the nodes that has class value > 4 from this list, but add them to a second list. So do not free them, just add to a 2nd linked list.
- Display the first linked list again and display the second linked list.

Write your C program as modular as it can be. The main program should mainly consist of necessary declarations and function calls.

Sample lines from a sample input file:

```
149875280;Burcu Aksu;04/04/1994;F;CS;3
160051581;Erhan Orkun;06/05/1995;M;EEE;3
155898933;Nuh Kaplan;26/01/1998;M;ME;2
157577471;Turgut Aksu;08/03/1995;M;IE;4
185060240;Hulya Kurt;04/08/1999;F;CivE;1
........
```

Sample run:

```
Enter file name: hw2.txt

Students:
 No. Id        Name                     G Birthdate  Dept  Class
==== ========= ======================== = ========== ===== =====
  1. 158763487 Aysel Limoncu            F 05/01/1994 CS      3
  2. 155313279 Tulin Can                F 12/02/1994 ME      3
  3. 148362136 Kaan Aksoy               M 05/03/1994 IE      3
  4. 149875280 Burcu Aksu               F 04/04/1994 EEE     3
........
 24. 174752325 Canan Ekermen            F 30/06/2000 CivE    1

Enter department code: CS

Students in CS:
 No. Id        Name                     G Birthdate  Dept  Class
==== ========= ======================== = ========== ===== =====
  1. 158763487 Aysel Limoncu            F 05/01/1994 CS      3
  2. 149875280 Burcu Aksu               F 04/04/1994 CS      3
........
  6. 189666820 Mert Aksoy               M 13/12/1998 CS      1

Student's class is incremented.
6 students are removed because they have graduated.

Students:
 No. Id        Name                     G Birthdate  Dept  Class
==== ========= ======================== = ========== ===== =====
  1. 158763487 Aysel Limoncu            F 05/01/1994 CS      4
  2. 155313279 Tulin Can                F 12/02/1994 ME      4
  3. 148362136 Kaan Aksoy               M 05/03/1994 IE      4
........
 18. 174752325 Canan Ekermen            F 30/06/2000 CivE    2

Graduated Students:
 No. Id        Name                     G Birthdate  Dept  Class
==== ========= ======================== = ========== ===== =====
  1. 146645310 Sevda Egemen             F 04/08/1994 CS      5
  2. 157577471 Turgut Aksu              M 08/03/1995 IE      5
........
  6. 151015628 Fatma Can                F 15/07/1997 ME      5
```

Hint-1:

To read from a string in "DD/MM/YYYY" format (e.g. "24/07/1998") into three integer variables, you can use a C statement similar to:

```
sscanf (datestring, "%d/%d/%d", &day, &month, &year);
```

Hint-2:

You can use the following functions if you like:

```
// getnode: allocate memory for a node and return its address.
nodeptr getnode()
{
  return ( (nodeptr) malloc (sizeof(node_t)) );
} // end getnode
```

```
// dateStrInt: Converts "DD/MM/YYYY" to int YYYYMMDD date format, and
// returns it. Sample function call: ymd = dateStrInt("04/12/2018");
int dateStrInt(char str[])
{
  int d, m, y;
  sscanf(str, "%d/%d/%d", &d, &m, &y);
  return (y * 10000 + m * 100 + d);
} // end dateStrInt
```

```
// splitDate: separates day, month and year from YYYYMMDD int date.
// Sample function call: splitDate(20181204, &day, &mon, &year);
void splitDate(int ymd, int *dp, int *mp, int *yp)
{
  *dp = ymd % 100;
  *mp = (ymd / 100) % 100;
  *yp = ymd / 10000;
} // end splitDate
```