EEL 5934/4930 Preliminary Work for Assignment 1

Important note: This is not an assignment and hence there is no associated due date. However, if you implement the programs described in this document, it will help you focus on the new concepts in Assignment 1 and you will have more time to debug your solution.

You are going to implement two programs using the C programming language:

1. **Email Filter:** Input: A sequence of emails, Output: A sequence of calendar events
The input will be read from the standard input and the standard output will be used for output. Each line of the input will represent an email, which will be in the following format (we are abstracting away other fields such as from, to, etc.):

Subject: String

If the subject string is in one of the following formats, then it is considered a calendar relevant event. The types of calendar events are as follows:

C,title,MM/DD/YYYY,HH:MM,location -> Create an event with the given title, date, and time
D,title,MM/DD/YYYY,HH:MM,location -> Delete an event with the given title, date, and time
X,title,MM/DD/YYYY,HH:MM,location -> Change the event with the matching title using the provided date, time, and, location

Both the title and the location are required to be of length 10. If the actual string is shorter, it must be padded with the space character. Note that the Email Filter program will not take any of the actions specified above. Instead, it will write the subject string if it matches one of the event types and well-formed.

As an example:

Sample Input (each email is on a separate line and note the white space used for the padding):
Subject: Hello
Subject: Greetings
Subject: C,Meeting ,01/12/2019,15:30,NEB202
Subject: Change in plans
Subject: X,Meeting ,01/12/2019,15:45,Larsen239
Subject: D,01/12/2019,15:45,Larsen239

Expected Output:
C,Meeting ,01/12/2019,15:30,NEB202
X,Meeting ,01/12/2019,15:45,Larsen239

Please note that the last email with the delete event is not well-formed as the title is missing. Therefore, it is not included in the output.

2. **Calendar Filter**: Input: A series of calendar events, Output: A sequence of tuples of dates, times, and locations

The goal of this program is to inform the user about the changes in the time or location of the earliest event of the days that have been edited in the calendar so that the user can plan when to leave home and choose the most convenient parking lot for a given day. The input will be read from the standard input and the standard output will be used for output.

We will assume that the calendar is empty (no events) when the program starts. It processes each calendar event (each on a separate line) one by one and if an output needs to be generated then it must be written to the standard output immediately before moving on to processing the next calendar event. **When it processes a calendar event, in addition to updating the calendar it also outputs the date, time, and location of the earliest event if the time or the location of the earliest event changes**. So, if a calendar event does not change the location or the time of the earliest event then nothing should be output as a result of processing that calendar event. In the special case of deleting all the events on a date, the time will be displayed as --:-- and the location will be displayed as NA. Each line of the output will be in the following format:

MM/DD/YYYY,HH:MM,location

Sample input 1:
C,Meeting ,01/12/2019,15:30,NEB202
X,Meeting ,01/12/2019,15:30,Larsen239

Expected Output:

01/12/2019,15:30,NEB202
01/12/2019,15:30,Larsen239

Sample input 2:
C,Class ,01/13/2019,10:30,NEB102
C,Meeting ,01/12/2019,15:30,NEB202
X,Meeting ,01/12/2019,15:30,Larsen239
C,Lab ,01/12/2019,11:30,Larsen239

Expected Output:

01/13/2019,10:30,NEB102
01/12/2019,15:30,NEB202
01/12/2019,15:30,Larsen239
01/12/2019,11:30,Larsen239

Sample input 3:

```
C,Class     ,01/13/2019,10:30,NEB102
C,Meeting   ,01/12/2019,15:30,NEB202
D,Meeting   ,01/12/2019,15:30,NEB202
C,Lab       ,01/12/2019,17:30,Benton321
```

Expected Output:

```
01/13/2019,10:30,NEB102
01/12/2019,15:30,NEB202
01/12/2019,--:--,NA
01/12/2019,17:30,Benton321
```

Sample input 4:

```
C,Class     ,01/13/2019,10:30,NEB102
C,Meeting   ,01/12/2019,15:30,NEB202
C,Lab       ,01/12/2019,15:30,Benton321
```

Expected Output:

```
01/13/2019,10:30,NEB102
01/12/2019,15:30,NEB202
01/12/2019,15:30,Benton321
```

Sample input 5:

```
C,Class     ,01/13/2019,10:30,NEB102
C,Meeting   ,01/13/2019,15:30,Larsen239
```

Expected Output:

```
01/13/2019,10:30,NEB102
```

As in the case of Email Filter, location must have exactly 10 characters (padded with whitespace if needed).

Both the Email Filter and the Calendar Filter programs should check for the end of file (EOF) character while reading from the standard input. When testing your programs, if you enter the input on the terminal you can use CTRL-D to simulate the EOF. Alternatively, you can save your input file and redirect it to your executable as follows:

```
$ ./myprog < inputfile
```