To improve the experience of customers, an online social network site would like to add a feature that can display and share a timeline of major events/photos of a user. The user might have many events, given a time range, how would you find/display events efficiently?

The goal of HW5 is to manage the timeline and allow the user to specify a time range to display/share his/her major events. To improve efficiency, your implementation uses a skip list that includes the following operations:

- \texttt{get(skiplist, key)} // if \texttt{key} exists, return value associated with \texttt{key}; otherwise, return NULL
- \texttt{put(skiplist, key, value)} // if \texttt{key} doesn’t exist, add entry and return NULL; otherwise, replace value and return the old value
- \texttt{remove(skiplist, key)} // if \texttt{key} exists, remove entry and return its value; otherwise, return NULL
- \texttt{floorEntry(skiplist, key)} // return the entry with the largest \texttt{key} less than or equal to \texttt{key}; return null if no such entry exists
- \texttt{ceilingEntry(skiplist, key)} // return the entry with the smallest \texttt{key} greater than or equal to \texttt{key}; return null if no such entry exists
- \texttt{subMap(skiplist, key1, key2)} // return all entries with \texttt{key} such that \texttt{key1} ≤ \texttt{key} ≤ \texttt{key2}

Use \texttt{getRandHeight()} in fakeRandHeight.c (FakeRandomHeight in java) for \texttt{put(key, value)} (to facilitate easier debugging and testing) \texttt{[gcc -o hw5 hw5.c fakeRandHeight.c].}

Program files are on the course website. We will evaluate your submissions on code01.fit.edu so we strongly recommend you to test your programs on code01.fit.edu. To preserve invisible characters, we strongly recommend you to download and save, NOT copy and paste, input data files.

Input: Input is from the command-line arguments for hw5.c:
- \texttt{filename of actions}, each line has one of the following actions:
  - \texttt{DisplayEvent date event/none}
  - \texttt{AddEvent date event success}
  - \texttt{DeleteEvent date success/noDateError}
  - \texttt{DisplayEventsBetweenDates startDate endDate date1:event1 \ldots or none}
  - \texttt{DisplayEventsFromStartDate startDate date1:event1 \ldots or none}
  - \texttt{DisplayEventsToEndDate endDate date1:event1 \ldots or none}
  - \texttt{DisplayAllEvents date1:event1 \ldots or none}
  - \texttt{PrintSkipList (Sh) empty}
  
  \texttt{... (S1) date1:event1 ...}
  \texttt{(S0) date1:event1 ...}

Sample output is on the course website.

Submission: Submit hw5.c that has the main method, and other program files. Submissions for Individual and GroupHelp have the same guidelines as HW1.

Note the late penalty on the syllabus if you submit after the due date and time as specified at the top of the assignment.