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 SkipListMap class with at least the following operations:

- `get(k)` [p. 403]
- `put(k, v)` [p. 403]
- `remove(k)` [p. 403]
- `ceilingEntry(k)` [p. 428]
- `floorEntry(k)` [p. 428]
- `subMap(k1, k2)` [p. 428]

Use DoublyLinkedList [p. 135], which you would modify, to implement the SkipListMap class. You may also implement your own DoublyLinkedList. Use FakeRandomHeight for `put(k, v)` (to facilitate easier debugging and testing). Program files for both classes are on the course website.

**Input:** Input is from the command-line arguments for HW5.java:

- `filename` of actions, each line has one of the following actions:
  - `DisplayEvent date`
  - `AddEvent date event`
  - `DeleteEvent date`
  - `DisplayEventsBetweenDates startDate endDate`
  - `DisplayEventsFromStartDate startDate`
  - `DisplayEventsToEndDate endDate`
  - `DisplayAllEvents`
  - `PrintSkipList`

For simplicity, dates are in MMDD format (MM is 01-12, DD is 01-31). You may assume the dates are unique (a more detailed timestamp would be unique in the real-world). Sample input is on the course website.

**Output:** Output goes to the standard output (screen), each line has a result for the corresponding action:

- `DisplayEvent date event/none`
- `AddEvent date event success/existingDateError`
- `DeleteEvent date success/noDateError`
- `DisplayEventsBetweenDates startDate endDate date1: event1 ... or none`
- `DisplayEventsFromStartDate startDate date1: event1 ... or none`
- `DisplayEventsToEndDate endDate date1: event1 ... or none`
- `DisplayAllEvents date1: event1 ... or none`
- `PrintSkipList`
  
  (Sh) empty
  
  ... (S1) date1: event1 ...
  
  (S0) date1: event1 ...

Sample output is on the course website.

**Submission:** Submit HW5.java that has the main method, SkipListMap.java, (modified) DoublyLinkedList.java, FakeRandomHeight.java 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.