

Solution 1

```
1 // Copyright © 2020 AlgoExpert, LLC. All rights reserved.
2
3 import java.util.*;
4
5 class Program {
6     // O(c1 + c2) time | O(c1 + c2) space - where c1 and c2 are the respective numbers of meetings
7     // in calendar1 and calendar2
8     public static List<StringMeeting> calendarMatching(
9         List<StringMeeting> calendar1,
10         StringMeeting dailyBounds1,
11         List<StringMeeting> calendar2,
12         StringMeeting dailyBounds2,
13         int meetingDuration) {
14         List<Meeting> updatedCalendar1 = updateCalendar(calendar1, dailyBounds1);
15         List<Meeting> updatedCalendar2 = updateCalendar(calendar2, dailyBounds2);
16         List<Meeting> mergedCalendar = mergeCalendars(updatedCalendar1, updatedCalendar2);
17         List<Meeting> flattenedCalendar = flattenCalendar(mergedCalendar);
18         return getMatchingAvailabilities(flattenedCalendar, meetingDuration);
19     }
20
21     public static List<Meeting> updateCalendar(
22         List<StringMeeting> calendar, StringMeeting dailyBounds) {
23         List<StringMeeting> updatedCalendar = new ArrayList<StringMeeting>();
24         updatedCalendar.add(new StringMeeting("0:00", dailyBounds.start));
25         updatedCalendar.addAll(calendar);
26         updatedCalendar.add(new StringMeeting(dailyBounds.end, "23:59"));
27         List<Meeting> calendarInMinutes = new ArrayList<Meeting>();
28         for (int i = 0; i < updatedCalendar.size(); i++) {
29             calendarInMinutes.add(
30                 new Meeting(
31                     timeToMinutes(updatedCalendar.get(i).start),
32                     timeToMinutes(updatedCalendar.get(i).end));
33             )
34         return calendarInMinutes;
35     }
36
37     public static List<Meeting> mergeCalendars(List<Meeting> calendar1, List<Meeting> calendar2) {
38         List<Meeting> merged = new ArrayList<Meeting>();
39         int i = 0;
40         int j = 0;
41         while (i < calendar1.size() && j < calendar2.size()) {
42             Meeting meeting1 = calendar1.get(i);
43             Meeting meeting2 = calendar2.get(j);
44             if (meeting1.start < meeting2.start) {
45                 merged.add(meeting1);
46                 i++;
47             } else {
48                 merged.add(meeting2);
49                 j++;
50             }
51         }
52         while (i < calendar1.size()) merged.add(calendar1.get(i++));
53         while (j < calendar2.size()) merged.add(calendar2.get(j++));
54         return merged;
55     }
56
57     public static List<Meeting> flattenCalendar(List<Meeting> calendar) {
58         List<Meeting> flattened = new ArrayList<Meeting>();
59         flattened.add(calendar.get(0));
60         for (int i = 1; i < calendar.size(); i++) {
61             Meeting currentMeeting = calendar.get(i);
62             Meeting previousMeeting = flattened.get(flattened.size() - 1);
63             if (previousMeeting.end >= currentMeeting.start) {
64                 Meeting newPreviousMeeting =
65                     new Meeting(previousMeeting.start, Math.max(previousMeeting.end, currentMeeting.end));
66                 flattened.set(flattened.size() - 1, newPreviousMeeting);
67             } else {
68                 flattened.add(currentMeeting);
69             }
70         }
71         return flattened;
72     }
73
74     public static List<StringMeeting> getMatchingAvailabilities(
75         List<Meeting> calendar, int meetingDuration) {
76         List<Meeting> matchingAvailabilities = new ArrayList<Meeting>();
77         for (int i = 1; i < calendar.size(); i++) {
78             int start = calendar.get(i - 1).end;
79             int end = calendar.get(i).start;
80             int availabilityDuration = end - start;
81             if (availabilityDuration >= meetingDuration) {
82                 matchingAvailabilities.add(new Meeting(start, end));
83             }
84         }
85         List<StringMeeting> matchingAvailabilitiesInHours = new ArrayList<StringMeeting>();
86         for (int i = 0; i < matchingAvailabilities.size(); i++) {
87             matchingAvailabilitiesInHours.add(
88                 new StringMeeting(
89                     minutesToTime(matchingAvailabilities.get(i).start),
90                     minutesToTime(matchingAvailabilities.get(i).end));
91             )
92         return matchingAvailabilitiesInHours;
93     }
94
95     public static int timeToMinutes(String time) {
96         int delimiterPos = time.indexOf(":");
97         int hours = Integer.parseInt(time.substring(0, delimiterPos));
98         int minutes = Integer.parseInt(time.substring(delimiterPos + 1, time.length()));
99         return hours * 60 + minutes;
100    }
101
102    public static String minutesToTime(int minutes) {
103        int hours = minutes / 60;
104        int mins = minutes % 60;
105        String hoursString = Integer.toString(hours);
106        String minutesString = mins < 10 ? "0" + Integer.toString(mins) : Integer.toString(mins);
107        return hoursString + ":" + minutesString;
108    }
109
110    static class StringMeeting {
111        public String start;
112        public String end;
113
114        public StringMeeting(String start, String end) {
115            this.start = start;
```

```
116         this.end = end;
117     }
118 }
119
120 static class Meeting {
121     public int start;
122     public int end;
123
124     public Meeting(int start, int end) {
125         this.start = start;
126         this.end = end;
127     }
128 }
129 }
130
```