JP2 2019: Lab exam (Version E)

This lab exam is intended to be completed during the 1-3pm Tuesday timeslot (Lab sections 9 and 10). If you are taking the exam at a different time, you should locate the correct specification instead of this one.

Overview

You will model a system designed to allow people to choose a meeting time that works for everyone.[1] It is based around the concept of a **Time Slot** – the system proposes a number of time slots, and then users indicate for each time slot whether that time slot is suitable. At the end, the system goes through all of the time slots and chooses the one that is suitable for the largest number of people.

For each time slot, a user can respond with one of three possible options: **Yes, No,** and **If-Need-Be**. The following table shows how a poll might look after four users have voted:[2]

	Oct 15 9am	Oct 16 9am	Oct 17 9am	Oct 18 9am
Shannon Hills	Yes	No	No	If-Need-Be
Leonard Cooper	Yes	Yes	If-Need-Be	Yes
Martin Bruun	Yes	If-Need-Be	Yes	Yes
Lisa Clark	Yes	Yes	If-Need-Be	If-Need-Be

After all users have voted, the system chooses the best option based on their votes. This can be done in two ways: either **If-Need-Be** can be treated as a **Yes**, or else it can be treated as a **No**. Using the above data, the final selected time slot would be as follows:

- If **If-Need-Be** is treated as **Yes**, then either the first or the fourth time slot would be selected
- If **If-Need-Be** is treated as **No**, then only the first time slot would be selected

[1] This is very similar to the mechanism used by websites such as Doodle.com.
[2] Based on https://help.doodle.com/hc/en-us/articles/360012047974-How-do-I-create-a-Yes-No-Ifneedbe-poll-

Task 1: UserResponse (2 marks)

*Note about implementation: all classes created in this exam should be put in the **scheduling** package.*

You must create an enumerated type **UserResponse** with the following values:

YES, NO, IF_NEED_BE

Task 2: TimeSlot (7 marks)

You must create a class **TimeSlot** representing a time slot in the scheduling problem. The **TimeSlot** class must have the following fields:

- date: (a String)
- time: (a String)
- votes: (a Map<String, UserResponse> representing user responses)

TimeSlot should have a constructor with the following signature:

public TimeSlot(String date, String time)

The constructor should set the two fields, and should also set the **votes** field to an empty Map.

The **TimeSlot** class should also include the following:

- **get** methods for the date and time
- Appropriate implementations of **equals()**, **hashCode()**, and **toString()**

In addition, it should include:

- A method **void setVote(String user, UserResponse response)** that sets the vote for a given user
- A method **UserReponse getVote(String user)** that returns the vote for a given user

Task 3: Scheduler (3 marks)

Create a class **Scheduler** representing a scheduling task. This class should have two fields – you can choose whatever data type you want for both fields.

- users: (a collection of Strings)
- timeSlots: (a collection of TimeSlots)

The **Scheduler** class should also have a constructor that sets the value of both fields. **You do not need to override equals(), hashCode(), or toString() for this class.**

Task 4: chooseTimeSlot (7 marks)

Add an additional method to the **Scheduler** class with the following signature:

public TimeSlot chooseTimeSlot(boolean ifNeedBe)

This method should process all of the time slots and choose a slot that the most users have voted for. If there is more than one such slot, it can return any of the slots. If the **ifNeedBe** flag is true, the method should consider all **IF_NEED_BE** votes to be **YES**; if **ifNeedBe** is false, then **IF_NEED_BE** should be considered to be **NO**.

What to submit

On Moodle, go to **Lab Exam Submission – Version E** and upload the following three files:

- UserResponse.java
- TimeSlot.java
- Scheduler.java

Be sure to submit to the correct assignment link, and be sure to submit before the deadline.