Interview Assignment

You are going to present your solutions in the technical interview. You can write code, pseudo code, or design documents without code. When writing code, you can use any language if you haven't learned Scala.

Task 1

Model the concept of availability (or available time), and design and implement a function that finds commonly available time slots given the availability of two people as the input.

Task 2

Let's build a cheap copy of Stackoverflow. Suppose we have a board where anyone can post questions with tags. Now you are implementing the feature of tag subscription. Each user who subscribes to a tag, say "scala", will receive a notification whenever a new question has been posted with that tag. (The notification can contain the question content or a link to view the question; this detail is not part of the scope of this task.)

Step 0 (optional)

Make it work statically. You can write a function that takes a list of questions with their tags and a list of users with their subscribing tags and return a map from users to questions that assign each user to all the questions having matching tags.

Step 1

Use a datastore (database or file). How would store all the users and their tags? When a new question gets posted, how to efficiently find all relevant users to notify? The notification action here can be simply printing "notifying user x".

Step 2

Make a demo. You don't have to build an API for it. A command-line interface is fine.

Step 3 (bonus)

Now image we have 5 billion users, and our machines have very limited memory (1 GB) and CPU (1 core). But we have infinitely many such machines. How can you make it still work?