Python Dev Assignment

Here is the test aimed to assess your Python and Django skills. Please reply to this email with a link to a git repository containing your code within the timeframe of 24 hours in order to complete it.

The Django Test

We have made a boilerplate Django setup with Docker for our upcoming product. You should be provided with the Git repo by email. Look at the readme-file in the repo to find instructions on how to setup Docker, and spawn the container.

When Docker is running, you should extend the codebase with the following modifications:

1. User access - The application should support multiple users. For the scope of this test, create 10 user accounts.
2. Friend list - The above 10 users should also be associated through a friendship relation. Assign some at random.
3. Expose an API using “Django REST Framework” for programmatic access to create and remove friendships for two given users.

Write a markdown file with quick notes on how you solved each step.

The Python Test

This part of the test can be implemented independently of the Django test.

The point of the test is to write a simple and elegant solution. You should not worry about runtime-efficiency.

You are the manager of a small software company with 8 employees, Albert, Børge, Carla, Dorte, Eric, Finn, Gurli and Hugo (in the program the employees can be named A, B, C, D, E, F, G and H). Each of the employees have various skills and areas of expertise. The company has numbered these skills and areas of expertise using the letters from 'a' to 'z'. The skills and areas of expertise for the 8 employees are as follows:

```
Albert a b c d e f g h
Børge        d e f g h i j k
Carla              g h i j k l m n
Dorte                    k l m n o p q r
Eric                           n o p q r s t u
Finn   a b                           r s t u v w x y z
Gurli          e       i           o           u       y
Hugo     b c   e   g       k   m       q   s         x
```

When the company starts a new project, they first make a list of the skills and areas of expertise that are necessary for the project. Second, they form a project group where all the necessary skills and areas of expertise are represented in the group.

1. Write a program, which reads a list of necessary skills and areas of expertise, and prints all the different possible project groups.
2. Extend or rewrite your program to only produce groups with no redundant employees. *Hint: It is sufficient to do this as a post-processing step.*

Hint: This task is very similar to the knapsack problem

It can be assumed that the company never hires or fires people and that the employees never learn something new. Thus the list of skills and areas of expertise can be hardcoded in the program.

Here are two examples of groups with no redundant employees:

```
Input: l q s
Output:
C E
C H
D E
D F
D H

Input: a b d e i l n o r s t
Output:
A B D E
A C D F
A C E
A C F G
A D E G
A D F G
B C E F
B C E G H
B C F G
B D E G H
B D F
```