Coding challenge

We would like to ask you to do a fun coding exercise for us. Please keep in mind that it is not a classical algorithmic problem, so **your task is not limited to producing a correct result**. Imagine that your code will be read and modified by other developers, so they should be able to understand it easily. You should also remember that code should be easily extensible and maintainable, but at the same time, beware of overly complicated solutions and speculative design. Last but not least: there is no single best solution, so we encourage you to design and implement the solution in a way you think is right.

Problem description

You were asked by a doctor friend to create a "Hospital simulator" for her, which can simulate the future patient's state, based on their current state and a list of drugs they take.

Patients can have one of these states:

- F: Fever
- H: Healthy
- D: Diabetes
- T: Tuberculosis
- X: Dead

In the "Hospital simulator" drugs are provided to all patients. It is not possible to target a specific patient. This is the list of available drugs:

- As: Aspirin
- An: Antibiotic
- I: Insulin
- P: Paracetamol

Drugs can change patient's states. They can cure, cause side effects or even kill a patient if not properly prescribed.

Drugs effects are described by the following rules:

- Aspirin cures Fever;
- Antibiotic cures Tuberculosis;
- Insulin prevents diabetic subject from dying, does not cure Diabetes;
- If insulin is mixed with antibiotic, healthy people catch Fever;
- Paracetamol cures Fever;
- Paracetamol kills subject if mixed with aspirin;
- One time in a million the Flying Flying Spaghetti Monster shows his noodly power and resurrects a dead patient (Dead becomes Healthy).

Input

Parameter 1

List of patients' health status codes, separated by a comma. e.g. `"D,F,F"` means we have 3 patients, one with diabetes and two with fever.

Parameter 2

List of drugs codes, separated by a comma, e.g. `"As,I"` means patients will be treated with Aspirin and Insulin.

Output

Make sure the result is sent as a response to the client (see technical requirements). It should be a comma-separated string with number of patients with a given state, formatted as follows:

`F:NP,H:NP,D:NP,T:NP,X:NP`

Where:

- `F, H, D, T, X` are patient's health status codes;
- `NP` is a number of patients for a given state;
- E.g. `"F:0,H:2,D:0,T:0,X:1"` means there are two healthy patients and one that is dead.

Examples

1. Input:
   Parameter 1: `"D,D"`
   Parameter 2: `""`
   Output: `"F:0,H:0,D:0,T:0,X:2”` (diabetic patients die without insulin)

```
$ java -cp hospital-simulator.jar com.edgelab.hospital.Application "D,D"
F:0,H:0,D:0,T:0,X:2
```

2. Input:
   Parameter 1: `"F"`
   Parameter 2: `"P"`
   Output: `"F:0,H:1,D:0,T:0,X:0"` (paracetamol cures fever)

```
$ java -cp hospital-simulator.jar com.edgelab.hospital.Application "F" "P"
F:0,H:1,D:0,T:0,X:0
```

Technical Requirements

- Make sure that other developers have an easy time when they want to use your application.
- Make sure the application is extensible. It must be possible to add further drugs and further cures, so make sure to implement it as changeable and **persisted data**.
- Implement the application as a backend and give access through an API, which sends responses on the given requests.
- Make sure to test the application appropriately. Provide unit tests.

Result

When you feel pleased with your solution, please send us a zip source code of your project with instructions how to build and run it. Feel free to use a build automation tool (maven/gradle) or any other tool/library that you might find useful. **Make sure you put your full name in the file name of the zip file.**