CMT219 Competition 1: crack the code

The Enigma cipher was used by the German military to encrypt intelligence messages during World War II. Cryptanalysts at Bletchley Park were able to decrypt many of these messages by exploiting a number of flaws in the cipher, including the property that a given character in the plaintext (input message) stream would never encode to itself in the ciphertext (encoded message).

You have been asked to decode a message that has been encoded with a much simpler cipher, called Queasy cipher. You do not know the details of how Queasy works, except for the following:

- It only encodes capital letters; i.e., the plaintext alphabet is the set Ω = {A, B, C, . . . , Z}. Any other characters (e.g., whitespace, punctuation, etc.) in the plaintext are removed before the message is encoded.
- It is a simple substitution cipher; i.e., Queasy substitutes a given character x with another character y, where $x \in \Omega$ and $y \in \Omega$.
- Like Enigma, Queasy never encodes a character to itself; i.e., plaintext character x encodes to ciphertext character y such that $x \neq y$.

The ciphertext that you have been asked to decode is:

```
ETEVHTWGSAHGWYVPNKQOEGWYVPNKPDEPHWAOVWPFWNHANEVW
XAVOAEAJEUXTAOWBTEVHTWGSAHGWYVPNQAOQVGTYHAVAXETO
ANFQEOIQPLANTEVHFYNSQVEBEOWSKNCKLOPEVTYJAUFWYNCO
TWZESQEPERQSQOPEVYCEVHEGDEHEVHEYOPNQEEHWYFTKTEVH
TWGSAHGWYVPNKQOWVAPDEPWVTKFWNHANOTEVHTWGSAHGWYVP
NQAOPDANAENAWVTKPIWHWYFTKTEVHTWGSAHGWYVPNQAOQVPD
AIWNTHWVAWBPDAUQOYLFASQOPEVIDEPQOPDAWPDANWVA
```

Fortunately, you've been given a hint to help with your codebreaking. You've been told that the plaintext message contains the following phrase:

```
NEPALSERBIASWITZERLANDB
URKINAFASOKYRGYZSTANLUX
EMBOURGSLOVAKIATAJIKIST
ANUGANDACHADANDAUSTRIA
```

Write a Java program to help you decode the ciphertext. As a starting point, the file Competition1.java ('Learning Material → Competitions' on Learning Central) includes String representations of the ciphertext and hint phrase.

When correctly decoded the message will contain a question. Send me your answer to this question in an e-mail to MorganMJW@cardiff.ac.uk with the title 'CMT219 competition 1 solution: crack the code'. You can use whichever approach you wish to decode the message, but you must attach your Java source code to your e-mail to show how you approached the problem.

The deadline for you to e-mail your solution is 5pm on Friday 5th March 2021.