Problem 3. «Mixed hashes»

Alice and Bob are exchanging with encrypted messages. To encrypt data, they use the **Present** cipher with an 80-bit secret key in ECB format. They record the information in the form of graphic files in `*.ppm` format.

The header of the `*.ppm` file consists of three lines of the form:

```
P6
X Y
255
```

where X and Y are the sizes of the graphic file in pixels horizontally and vertically, respectively.

So, in `mikki.ppm`, the header is:

```
P6
360 537
255
```

To be more secure, Alice and Bob decided that file headers should be removed before encryption. In order to be able to recover the file header, they agreed to transmit along with the encrypted file the hash value of the header itself, presented in **UTF-8** format. To do this, all header elements are written as a single line, using a space to separate the lines of the original header. The **sha-256** function is used as a hashing algorithm. So, for example, the following hash value will be generated for the header of `mikki.ppm`:

Heading `P6 360 537 255`

Sha-256 `999015795668c201db162926261ed979bc6e820aa1acfc385a0285685084d9f9`

Bob prepared eight files for Alice without headers, encrypted using the **Present** algorithm with the same secret key in ECB mode. He has sent the files themselves and hash values of the headers to Alice. While sending, the hash values were mixed up. So, Alice received eight files and eight hash values, but she does not know which hash value corresponds to which encrypted file. Could you help Alice to read the message from Bob?

Hash values received are

```
602a4a8fff652291fdc0e049e3900dae608af64e5e4d2c5d4332603c9938171d
f40e838809ddaa770428a4b2adc1fff0c38a84abe496940d534af1232c2467d5
aa105295e25e11c8c42e4393c008428d965d42c6cb1b906e30be99f94f473bb5
70f87d0b880efcdbe159011126db397a1231966991ae9252b278623aeb9c0450
77a39d581d3d469084686c90ba08a5fb6ce621a552155730019f6c02cb4c0cb6
456ae6a020aa2d54c0c00a71d63033f6c7ca6cbc1424507668cf54b80325dc01
bd0fd461d87fba0d5e61bed6a399acdfc92b12769f9b3178f9752e30f1aeb81d
372df01b994c2b14969592fd2e78d27e7ee472a07c7ac3dfdf41d345b2f8e305
```