Problem Statement:

We have a bot flying around in the space taking pictures and sending them back to earth. Unfortunately, something went wrong with the bot. As a result some data is lost when the image reaches the earth. Given such image our objective is to reconstruct as much of it as possible correctly. For the sake of simplicity, we'll assume the image has only planets.

A planet can be defined as a combination of gas, liquid and solid states.

But, the data we get from the bot doesn't directly determine whether a point in space is of any of the above states. So, we ask an expert who gives us some data to help us determine the state of a point in space.

We have two datasets.

1. spacedata.txt - the image data we receive from space.
This contains a 1000x1000 matrix.
Each line represents a row. Columns in a row are space separated.
Each element in the matrix represents a point in space. The value of the element represents the state of the point. The range of the data of each element is 0-99. 0 means that the data for that point is lost.
This dataset has seven planets.

2. variousStatesDataset.txt - previous data mapping for the values 1-99 to any of the states.
This contains 4000 rows. Each row contains two space separated columns.
First column is a value of the range 1-99. Second column is a value of the range 1-4 representing any of the states.

1 - vaccum
2 - gas
3 - liquid
4 - solid

The objective of the problem is to fill up the image so that we can make sense out of it. Ideally the output image should clearly represent the aforementioned states.