As part of the assignment please follow good software engineering practices, demonstrate how you would normally test software, and document and design or coding decisions you have made. The details are below:

As part of the system architecture at a data processing company, you need to design a Service to clean data produced by another service (the client).

The data is a list of category sub-category pairs. For example, one set of data might be:

Category	Subcategory
PERSON	Bob Jones
PLACE	Washington
PERSON	Mary
COMPUTER	Mac
PERSON	Bob Jones
OTHER	Tree
ANIMAL	Dog
PLACE	Texas
FOOD	Steak
ANIMAL	Cat
PERSON	Mac

There is a list of valid categories managed by your service. By default, the valid categories are:

Category
PERSON
PLACE
ANIMAL
COMPUTER
OTHER

When your service receives data from a client, it must process the data, removing duplicate (category, subcategory) pairs and invalid categories. The order of entries in the input data must be preserved, with the duplicates and invalid categories removed. The output must also include the count of entries for each valid category, sorted by the number of valid, unique entries.

Sample output for the sample input:

Category	Subcategory
PERSON	Bob Jones
PLACE	Washington
PERSON	Mary
COMPUTER	Mac
OTHER	Tree
ANIMAL	Dog
PLACE	Texas
ANIMAL	Cat
PERSON	Mac

Category	Count
PERSON	3
PLACE	2
ANIMAL	2
COMPUTER	1
OTHER	1

In addition to processing input data, your service must also provide the ability to add to, delete from, and list the valid categories. Once the category list is modified, subsequent processing requests will apply the new category list to the input data. While a real-world system would use a permanent datastore for the category information (so the current list of categories would be preserved if the service needs to be restarted), it is sufficient for this exercise to maintain the category list in memory.

Please implement a REST Service that provides the above functionality. It is up to you to define the input and output data formats, as well as the REST endpoints that are used for data processing and category management. You must also describe how to deploy and monitor your service, as well as any changes that would be required to load balance your service.