Case Study: Product – Category assignment

A multi-national consumer electronics retail company strives to get more and more flexible in the way how products are clustered and presented to its customers. Its e-commerce system contains huge numbers of products, which have different property fields. There is also a catalog of categories, which is categorizing the products. Each product can have one or many assigned categories. The catalog of categories is a hierarchical tree. With the new business requirements, a new category tree was defined by the business and should now be "filled" with products.

The challenge is to assign the right categories to a product. Since it would be way too time consuming to be done by the product management team manually, it is needed to implement a solution that will assign the category automatically to the product.
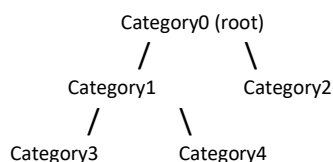
Task:
Please use the attached data sets to set-up an automated solution to assign categories to products that can be presented to the stakeholders in course of the interview. You can use any technology of your choice, whereas using cloud infrastructure (esp. Google Cloud Platform) is a plus.

Input:

1. Category Tree

    Example:

```
              Category0 (root)
               /        \
        Category1        Category2
          /    \
   Category3    Category4
```

2. Product Data Set (already assigned categories)
    Example:

```
Product1: {
        categories :  [category3, category2],

        "field1": "value1"

        "field2":{
                "field21" :"value21",
                "field22" :"value22"
        }

        "field3": "value3"
        …
}




    Product2: {
            categories :  [category2],
```

```
            "field1": "value1_2"

            "field2":{
                       "field21" :"value21_2",
                       "field22" :"value22_2"
            }

            "field3": "value3_2"
            …
}
```

3. New Product (To be assigned)

   Example:

```
Product3: {
            categoryies :  [],  // no category assigned yet

            "field1": "value1_3"

            "field2":{
                       "field21" :"value21_3",
                       "field22" :"value22_3"
            }

            "field3": "value3_3"
            …
}
```

Output:

1. New Product with assigned category

   Example:

```
Product3: {
            categories :  [Category4, category2],  // category assigned

            "field1": "value1_3"

            "field2":{
                       "field21" :"value21_3",
                       "field22" :"value22_3"
            }

            "field3": "value3_3"
            …
}
```

NOTE: It is important to describe approaches and the possible solution steps that can lead to have effective assignment category to a newly added product.

Result Submission: The following need to be done for result submission

- Please create repository in GitHub and push solution code there
- Please share GitHub link to us

- It is not necessary to give final solution, but it is important do give at least potential solution
- Ideally it should be a prototype demo, where it can get a product data as an input and return corresponding category ids