Herbaria are libraries of pressed, dead plants. They represent perhaps the most valuable source of cataloged biodiversity on our planet, and botanists are constantly adding new specimens to them every day. As a result, we are discovering new species, combining incorrectly split species into one, and extracting DNA from those pressed plants to explore the phylogenetic diversity of plants on our planet. How do botanists and geneticists make sure that they are cataloging a true diversity of species in these herbaria, and how do we find those missing species in the wild? Luckily, new databases like iNaturalist exist, where anyone with a smartphone can record a photo and GPS location of a plant anywhere in the world. **Your major task is to help prioritize how we identify new locations of a species that we should collect from and deposit in an herbarium.**

This challenge will use three major resources:

1) The New York Botanic Garden has one of the world’s premier herbaria, with more than 7.8 million specimens collected and pressed. There is an existing API that connects to this database, where you can retrieve information on herbarium records, including: genus and species, a digital photograph of the herbarium press, any location information, who collected it, and more.

2) iNaturalist is one of the world’s largest citizen-science initiatives to catalog plant diversity in the wild, allowing users to tag plants with GPS coordinates, photographs, and other attributes like flowering time, sex, and more.

3) The Open Tree of Life is a phylogeny of all living organisms, based on a synthesis of thousands of published phylogenetic trees for different groups of species.

Your challenge is to build a UI experience that connects the New York Botanic Garden’s virtual herbarium and:

-connects to the NYBG herbarium API through GBIF (<https://www.gbif.org/occurrence/map?dataset_key=d415c253-4d61-4459-9d25-4015b9084fb0>) and overlays the lat/long coordinates for all herbarium records of a given species onto a map of the United States

-displays the herbarium sheet photographs for all specimens

-connects to the iNaturalist API (<https://www.inaturalist.org/pages/api+reference>) and overlays the iNaturalist collection records for that same species onto the same map

-displays the iNaturalist photos for that species

-displays a genus-level phylogeny for that species by connecting to the Open Tree of Life API (<https://github.com/OpenTreeOfLife/germinator/wiki/Open-Tree-of-Life-Web-APIs>)