

# GIS 5571 Lab 1

**Due:** 2 weeks from the date of assignment

## Goals

1. Practice decomposing interfaces for spatial web API's into informal conceptual models
2. Compare and contract different web API's using informal conceptual models and custom-built extract, transform, and load (ETL) routines
3. Build an ETL pipeline with Open Source Tools in Esri's Online and ArcPro Jupyter Notebook and integrate a two datasets via spatial join

## Deliverables

Submit a lab report on Canvas as a PDF (see [report form](#)). Include all your code on Github.

## Specifics

For this lab:

1. Write a lab report that does two things:
  - a. Compare and contrast the conceptual models for the following API's
    - i. [Minnesota Geospatial Commons](#)
    - ii. [Google Places](#)
    - iii. [NDAWN](#)
  - b. Create Jupyter notebooks that can programmatically get data from each of these APIs. Using Jupyter notebooks, build a pipeline that
    - i. downloads two data sets,
    - ii. transform both datasets to the same [coordinate reference system](#) (geographic and projected),
    - iii. spatially joins them,
    - iv. prints to screen the head of the table showing the merged attributes, and
    - v. saves the integrated dataset to a geodatabase.
2. Make all code available on Github in your Lab 1 folder.

A few tips:

1. Before writing any code, start by using paper and pencil to unpack the dataset objects.
2. Look at other examples of how people designed ETL code.
  - a. Towards Data Science [article](#) on ETL with CRON or Jupyter
    - i. Google terms you don't understand (there are a lot of resources)

