Interactive Visualization of Large-scale Movement Data using Apache Spark

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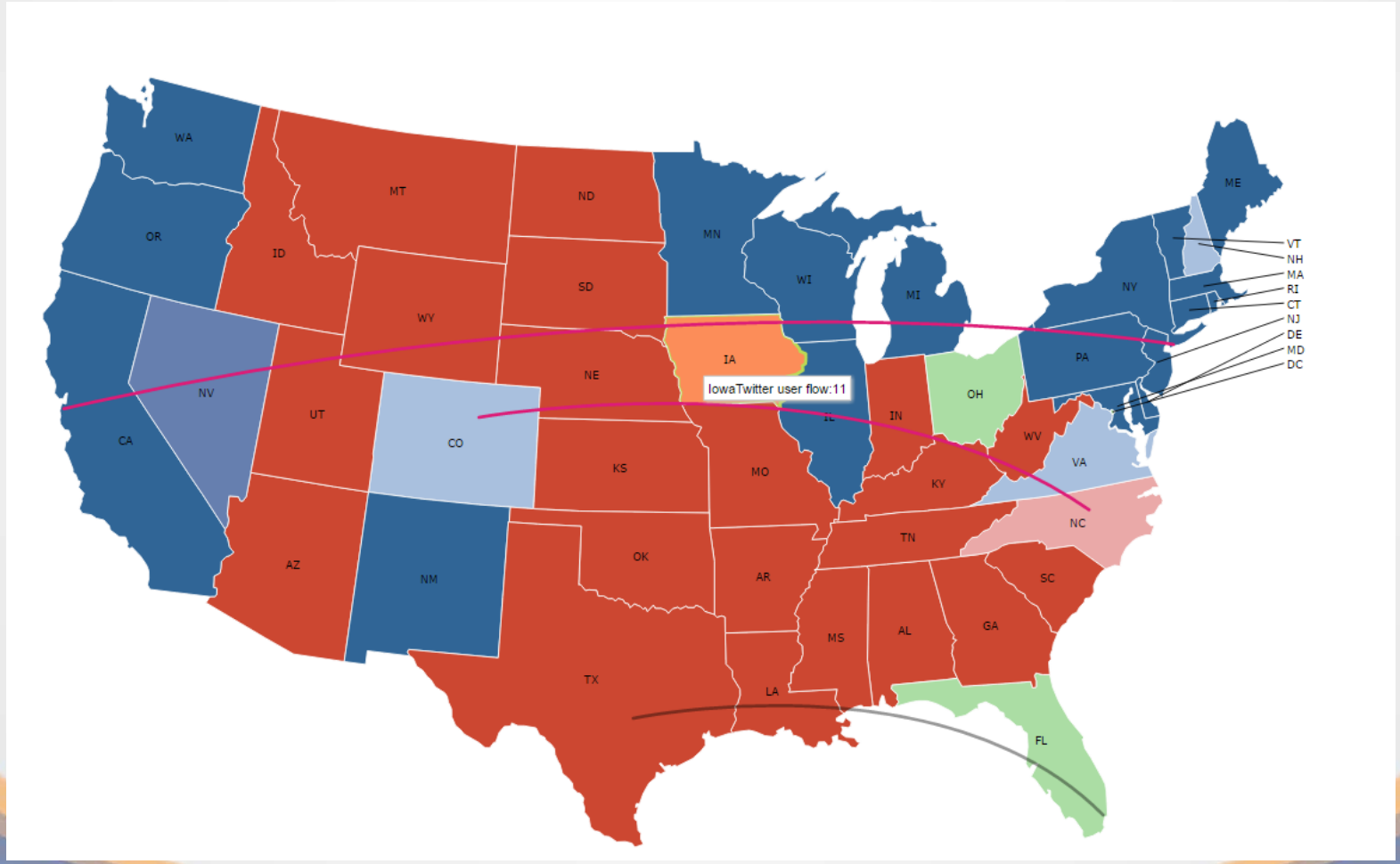
Today's main objective:



How to get the visualization

- It is based on DataMaps: http://datamaps.github.io/
- An extended library based on D3.js

- How to customize the existing source code base for your own use
  - Create your own map layers with TopoJSON (https://github.com/mbostock/topojson/wiki)
  - Choose one of the existing template to get started

- Setup an http server to host the web page
  - E.g., python -m SimpleHTTPServer 8000
  - Note, to use the lab computer, you need to use Python that comes along with ArcGIS

Let's go through the script

- The data is located in ROGER: /gpfs_scratch/geog479/lecture11
- The web page functional based on JavaScript
- The TopoJSON is modified to exclude Alaska and Hawaii
- Pay attention to how to set the color values and how to draw arcs
- Question: How to calculate the origin and destination coordinates?

How Spark can help prepare the data?

- For this case, we are utilizing Twitter data to generate the flows
  - You can apply it to the Taxi data, or any other movement data that track people's movement from A to B

How to calculate the volume of tweets in each state?

How to summarize the movement flux among different states?

Calculate the volume of tweets in each state

- Before we get started, what is your plan?
- Let's examine the details in spark_pinP.py

Summarize the movement flux

- Now we know the trajectory of each user travelling from one state to another
  - How do we summarize the flows among states (in a MapReduce way)
- How do we incorporate such results to (interactive) visualization?