

New Teams

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New Project: Hop Teaming

Goals:

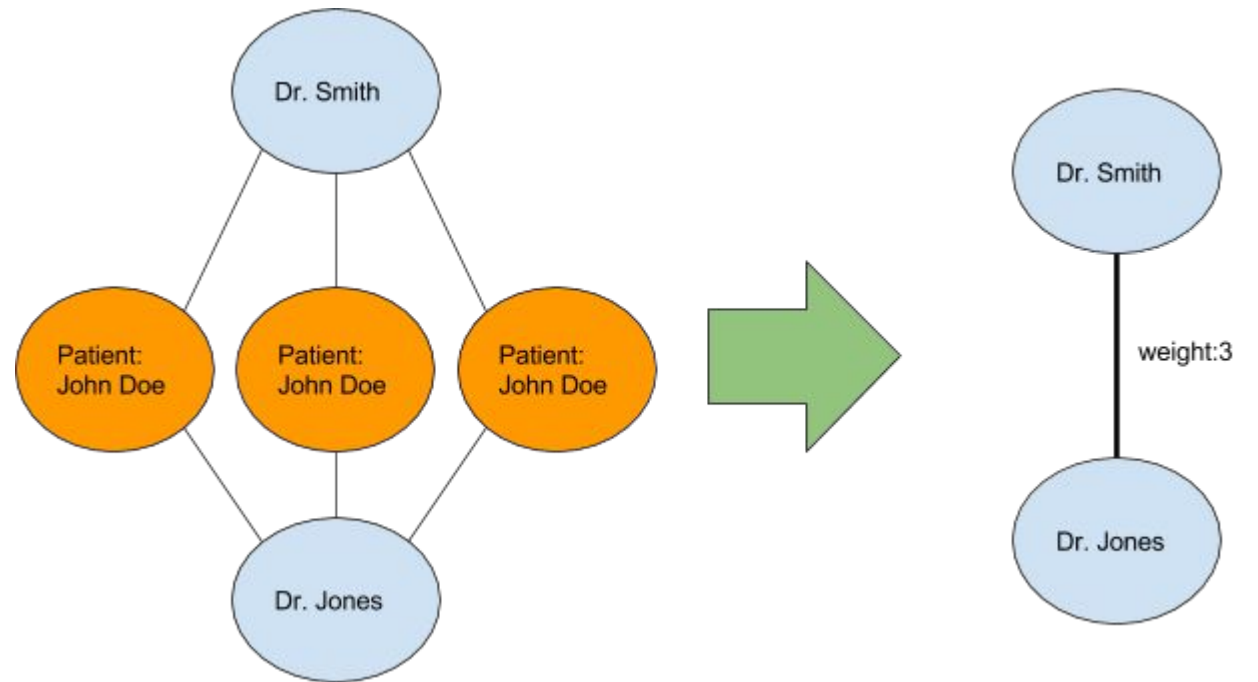
- Understand referral patterns for healthcare providers within Tennessee and to Nashville area hospitals.
- Generate recommendations for which professionals Vanderbilt Hospital should reach out to in the Nashville area to expand their own patient volume.
- Apply an unsupervised learning algorithm, **community detection**, to the network of healthcare providers.

New Project: Hop Teaming

For this project, you'll be working with the DocGraph Hop Teaming dataset.

This is a graph dataset of healthcare provider, based on Medicare claims.

Nodes are doctors/facilities and edges correspond to shared patients.

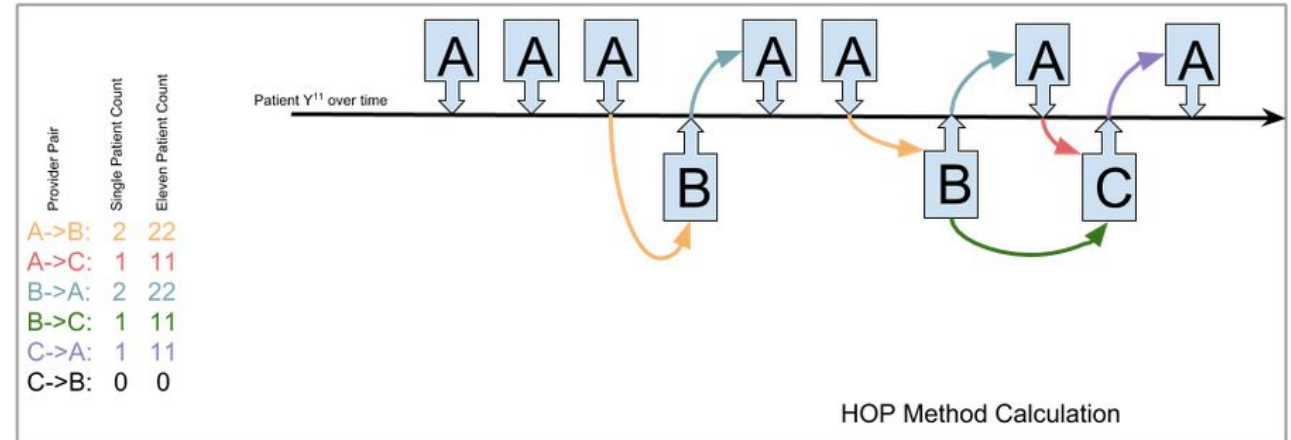


New Project: Hop Teaming

A pair of nodes (A,B) has an edge if a patient sees provider A and then later sees provider B.

Each time a patient sees provider A and then afterwards sees provider B, this adds a count to that edge.

Important: only the latest visit to A counts.



New Project: Hop Teaming

Structure of the dataset:

- from_npi – The provider seen first in sequence, coded by NPI
- to_npi – The provider seen second in sequence, coded by NPI
- patient_count – The total number of patients shared between the two providers over the entire time period (one year)
- transaction_count – The count of times that a patient switched between the two providers, in the from-to direction.
- average_day_wait – The average amount of days it took for a “HOP” to occur. Which is the the time it took, in days, for a patient to switch to the second provider after having seen the first provider.
- std_day_wait – The standard deviation of days it took for a HOP to occur.

New Project: Hop Teaming

Caveats:

- These are not explicit referrals.
- Based on CMS Medicare datasets, so it covers mostly people who are over age 65.
- Not all providers bill Medicare or accept Medicare patients.
- Does not include pharmacy fill events.
- Providers sometimes have two NPIs, one for individual and another for organization.

New Project: Hop Teaming

To avoid “accidental” referrals, you can filter based on transaction count or average day wait.

Recommendation: filter for transaction_count at least 50 and the average_day_wait less than 50.

NPPES Data

The CMS National Plan and Provider Enumeration System (NPPES) provides basic information about all organization and individual providers with a National Provider Identifier (**NPI**).

An NPI is a 10 digit number assigned to both individuals and organizations and is mandatory for all bills to Medicare.

NPPES Data

Important Fields:

- Entity Type
 - 1 = Provider (doctors, nurses, etc)
 - 2 = Facility (Hospitals, Urgent Care, Doctor Offices)
- Name
 - First/Last
 - Organization/Other Organization Name
- Address
 - Business Practice Location
- Taxonomy Code
 - Can have up to 15 different codes
 - We'll use the one with Primary Switch = Y, which is not always in spot 1

Other Data

- Taxonomy code to classification crosswalk from the National Uniform Claim Committee taxonomy code to classification crosswalk
 - Using the primary taxonomy code, match each provider to a classification (from the Classification column).
- Zip code to CBSA crosswalk
 - Can be used to narrow down to providers in the Nashville CBSA

Recommendation

The datasets that you are working with are quite large, so you may want to use SQLite to help you manage the data.

Your first tasks should be figuring out how to clean up the data so that it is easier to work with. This could be done in chunks in pandas and then loaded into a SQLite database.

Warning: Only run the database creation code once!

Project Timeline

Thursday, 2/22	Project Start
Saturday, 2/24	Neo4j Introduction
Tuesday, 2/27	Community Detection in Neo4j Introduction
Tuesday, 3/5	Preliminary Presentations - starting at 8:00
Saturday, 3/9	Final Presentations (12:30) (No more than 15 minutes per group)

Each team should create and maintain a kanban board throughout this project. We'll be making frequent team check-ins during the project, and we'll use this as part of the discussion.