



Graphical User Interface for Legislative Data

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Indiana University Network Science Institute

- IUNI is cross-campus entity that fosters interdisciplinary, collaborative research in network science.
- Over 150 IU faculty are affiliated with IUNI representing library science, sociology, informatics, neuroscience, public health, and more.
- IUNI Affiliates work with IT and research staff and have access to IUNI IT infrastructure and data.



fostering
**INTERDISCIPLINARY
COLLABORATIVE
RESEARCH**



What Data is Available in GUILD?

The Current Database

- Data from the 2014, 2015 and 2016 legislative sessions
- Each version of each Bill submitted, whether assigned to a committee or not
- Each Amendment submitted, whether adopted or not
- Each legislator and their party affiliation
- Each standing committee, its members and bills assigned to that committee
- And most importantly, the relationships between them all



Data to be Added in the Future

- Data from the 2017 legislative session
- Conference Committees and Study Committees
- Enhanced Legislator biographies: <http://legdb.iga.in.gov/>
- Campaign Finance Data:
<http://campaignfinance.in.gov/PublicSite/Reporting/DataDownload.aspx>
- Any other data sources suggested



Data Storage

- The raw data is stored on an IUNI Geode directory as both JSON and PDF
- The JSON data has been parsed into a Neo4j Graph Database

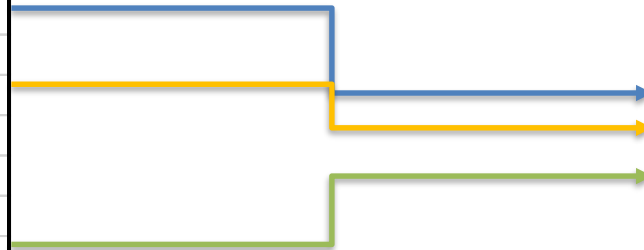


Why a Graph Database?

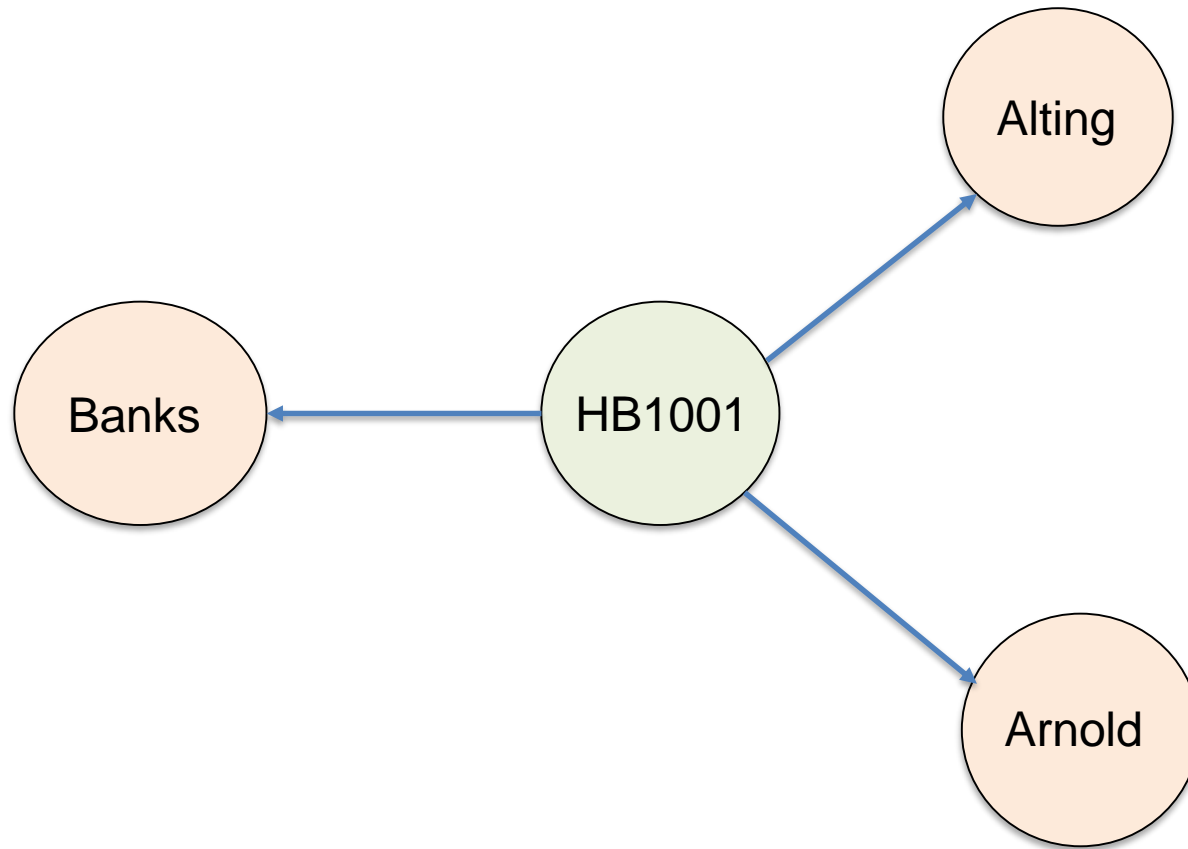
The Traditional Relational Database Model

PK	Full Name
1	SENATOR RON ALTING
2	REPRESENTATIVE LLOYD ARNOLD
3	SENATOR JAMES ARNOLD
4	REPRESENTATIVE TERRI JO AUSTIN
5	REPRESENTATIVE RONALD BACON
6	REPRESENTATIVE JAMES BAIRD
7	SENATOR JAMES BANKS

FK	Bill Name
1	HB1001
3	HB1001
7	HB1001
2	HB1002
4	HB1002
1	HB1003
5	HB1003
6	HB1003



The Graph Database Model



The Advantage of a Graph

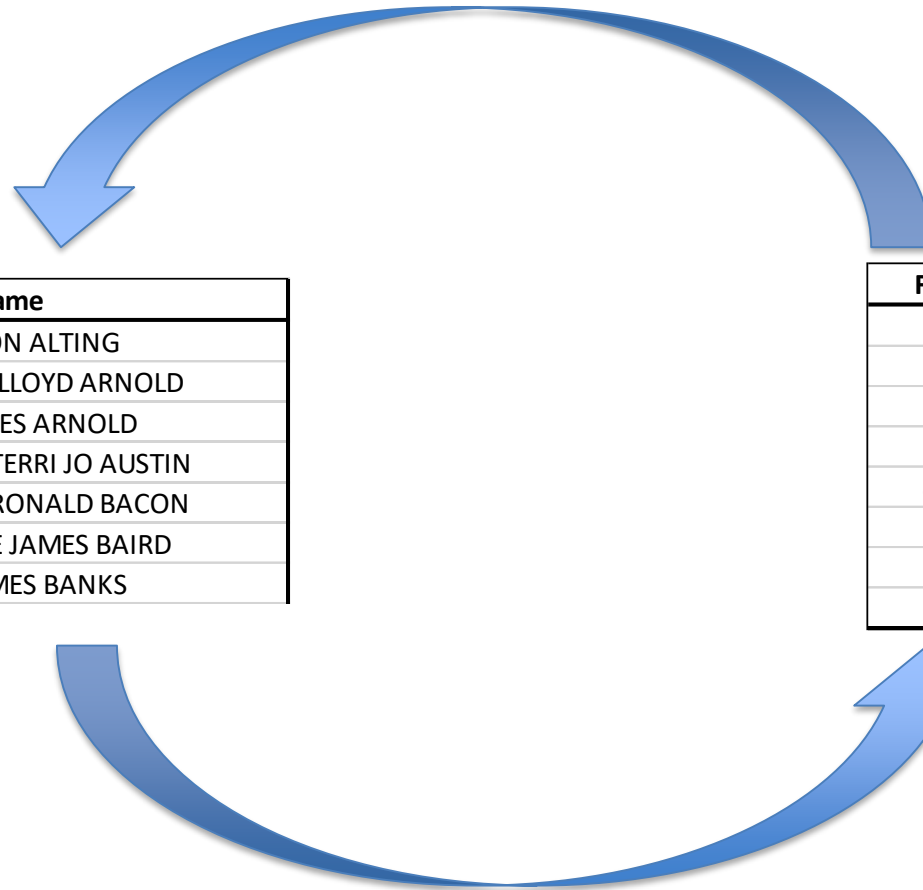
- Who sponsored HB1001 but not HB1003?
- Who has collaborated with Senator Alting and Senator Banks but not Representative Arnold?
- On what topic areas have Senator Arnold and Senator Banks collaborated in the past?



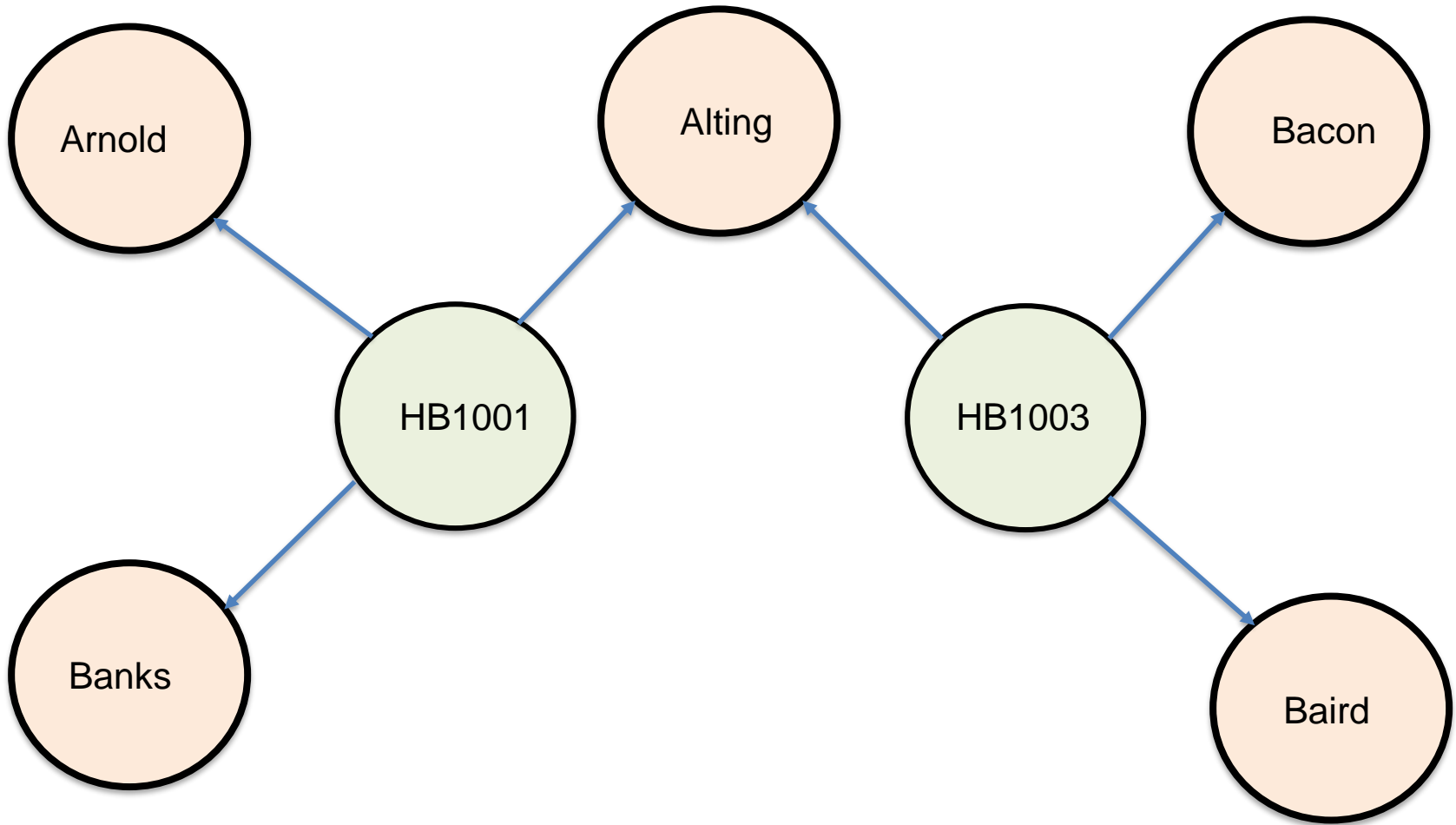
These types of questions are difficult to write in SQL and are computationally intensive

PK	Full Name
1	SENATOR RON ALTING
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FK	Bill Name
1	HB1001
3	HB1001
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5	HB1003
6	HB1003



In a graph, the search path is much more simple



The Database


[localhost:7474](#)

Neo4j - neo4j@localhost X

localhost:7474/browser/

\$

:play start



neo4j
COMMUNITY EDITION
3.1.3

Learn about Neo4j

A graph epiphany awaits you.

- What is a graph database?
- How can I query a graph?
- What do people do with Neo4j?

[Start Learning](#)

Jump into code

Use Cypher, the graph query language.

- Code walk-throughs
- RDBMS to Graph
- Query templates

[Write Code](#)

Monitor the system

Key system health and status metrics.

- Disk utilization
- Cache activity
- Cluster health and status

[Monitor](#)

Everything is social. Manage people relationships in your graph.

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\$ MATCH (n:bill) WHERE n.digest CONTAINS 'opioid' RETURN n.name, n.digest

n.name	n.digest
HB1218	Expires standards for operation rules concerning prior authorization for a take home supply of opioid treatment medication (current law requires rules to require prior authorization for more than 14 days of medication). Prohibits an opioid treatment program from prescribing, dispensing, or providing more than a seven day supply of opioid treatment medication to a patient to take out of the facility. Requires the division of mental health and addiction (division) to establish certain standards and protocols for opioid treatment programs. Requires an opioid treatment program to follow the standards and protocols adopted by the division for each opioid treatment program patient. Requires the dispenser at an opioid treatment program to transmit certain information to the division within specified time frames. Provides that the information is subject to federal patient confidentiality regulations. Requires a provider to release certain information from a committed patient's mental health records upon request of a court. Requires that the board of pharmacy adopt a rule requiring a practitioner and a opioid treatment program to check the Indiana scheduled prescription electronic collection and tracking (INSPECT) program in specified circumstances. Requires the division to report on the information collected. Increases the penalty to a Level 6 felony for violations of the central repository for controlled substances data laws. Requires the Indiana professional licensing agency to study the impact of including all prescription drugs in the INSPECT program and sets forth requirements of the study. Requires the legislative council to assign an interim committee to study: (1) the security of the INSPECT program; and (2) whether opioid treatment programs should be prohibited from allowing patients to take home opioid treatment medication. (The introduced version of this bill was prepared by the commission on mental health and addiction.)
HB1195	Provides that addictions counseling, inpatient detoxification, and the administration of Vivitrol or a similar substance may be required to treat opioid or alcohol addiction as a condition of parole, probation, community corrections, pretrial diversion, or participation in a problem solving court. Provides that the division of mental health and addiction may consider the administration of Vivitrol or a similar substance as an alternative to methadone treatment.
HB1304	Requires the criminal justice institute to track the number of juveniles in adult court. Requires custodial interrogations of juveniles to be recorded. Raises the ages for waiver of jurisdiction of certain juveniles to adult court. Allows a person with an intellectual disability, developmental disability, or autism spectrum disorder to participate in a forensic diversion program. Authorizes a prosecuting attorney to require a person participating in a prosecutorial diversion program to receive mental health treatment to reduce recidivism, and allows diversion and deferral fees to be used to fund mental health treatment programs to reduce recidivism. Allows a criminal court to appoint a forensic advocate to assist a person with an intellectual disability, developmental disability, or autism spectrum disorder who is charged with a criminal offense. Allows continuation of a prosecution for a person who is a drug abuser or an alcoholic charged with a misdemeanor or certain felonies. Provides that addiction counseling, inpatient detoxification, and the administration of a federal Food and Drug Administration (FDA) approved, nonaddictive medication for alcohol or opioid treatment may be required to treat opioid or alcohol addiction as a condition of parole, probation, community corrections, pretrial diversion, or participation in a problem solving court. Provides that the division of mental health and addiction may consider the administration of an FDA approved, nonaddictive medication for alcohol or opioid treatment as an alternative to methadone treatment. Repeals provisions allowing juvenile courts to modify disposition orders concerning truancy and runaways. Makes it a delinquent act for a child to leave a specific location designated by the child's parent, guardian, or custodian: (1) without reasonable cause; and (2) without permission of the parent, guardian, or custodian, who requests the child's return. Provides that a child who commits the delinquent act of running away may not be held in a juvenile detention facility. Provides that a juvenile shall not be restrained in court unless the court determines the juvenile is dangerous or potentially dangerous. Allows drug abusers or alcoholics charged with or convicted of certain felonies to request treatment for addictions. Provides that a convicted individual may be placed on probation if the individual requests to undergo substance abuse treatment. Provides for voluntary and involuntary treatment for drug addictions. Allows an alcohol and drug services program or the clerk of a court to collect fees concerning court established alcohol and drug services programs. Excludes possession of rolling papers and raw materials from the crime of possession of paraphernalia, and removes possession of paraphernalia as an infraction. Makes the knowing or intentional possession of paraphernalia a Class C misdemeanor, and increases the penalty to a Class A misdemeanor if the person has a prior unrelated judgment or conviction. Makes it a Level 6 felony to possess a hypodermic needle with intent to commit a controlled substance offense. (Under current law, the offense only applies if committed with intent to violate the legend drug act.) Requires the division of mental health and addiction and the division of disability and rehabilitative services to submit a report to the legislative council concerning services for individuals with dual diagnosis. Increases the penalty for child molesting if it results in the transmission of a dangerous sexually transmitted disease. Allows the state to seek the death penalty or a sentence of life without parole for a murder committed in a building primarily used for educational purposes if the murder is committed: (1) on school property or in a building owned by a postsecondary educational institution; and (2) at a time when children are likely to be present (for a building on school property) or classes are in session (for a building owned by a postsecondary educational institution). Authorizes the state to seek the death penalty or a sentence of life without parole for a murder committed in a building primarily used for religious worship if the murder is committed at a time when persons are likely to be present for religious worship or education. Makes technical corrections.
HB1449	Limits Medicaid reimbursement for Subutex and Suboxone or a similar trade name or generic of the drug when the drug was prescribed for the treatment of pain management to only if the drug was prescribed by a physician who meets certain requirements. Allows for the office of Medicaid policy and planning to require prior authorization for these drugs when being prescribed for substance abuse treatment as determined by the board or when being prescribed for more than six months. Authorizes the division of mental health and addiction (division) to approve before June 30, 2018, not more than five new opioid treatment programs if: (1) the programs are run by a hospital or a certified community mental health center; and (2) the division determines that there is a need for a new opioid treatment program in the proposed location. Requires the division to report to the general assembly before July 1, 2018, specified information concerning any new facilities. Requires the division of mental health and addiction to adopt rules concerning: (1) opioid treatment by an opioid treatment provider; (2) take home opioid treatment medications; (3) clinical standards for tapering of a patient, relapse, and overdose prevention; and (4) specified standards and protocols for an opioid treatment provider. Requires an opioid treatment provider to periodically and randomly test a patient for specified drugs during treatment.
HB1614	Requires the Indiana board of pharmacy or any licensing board, commission, or agency that controls, authorizes, or oversees controlled substance registrations to adopt rules to establish standards and protocols for practitioners who prescribe opioid controlled substances for pain management treatment. Provides that the rules may not be amended unless the proposed amendment has been approved by the medical licensing board. Makes a technical correction.
SB0406	Requires certain emergency personnel to report to the state department of health the number of times an overdose intervention medication is administered. Allows specified health care professionals with prescriptive authority to dispense, write a prescription, or prepare a standing order for an overdose intervention drug without examining the individual to whom it may be administered if specified conditions are met. Allows for an individual who is a person at risk, a family member, friend, or other individual or entity in a position to assist another individual who, there is reason to believe, is at risk of experiencing an opioid-related overdose, to obtain and administer an overdose intervention drug if certain conditions are met. Provides for civil immunity.

Returned 15 records in 109 ms.

\$ MATCH (a:bill)-[:AUTHORED_BY]-(b:legislator) WHERE a.digest CONTAINS 'opioid' RETURN a.name, b.fullname, b.party

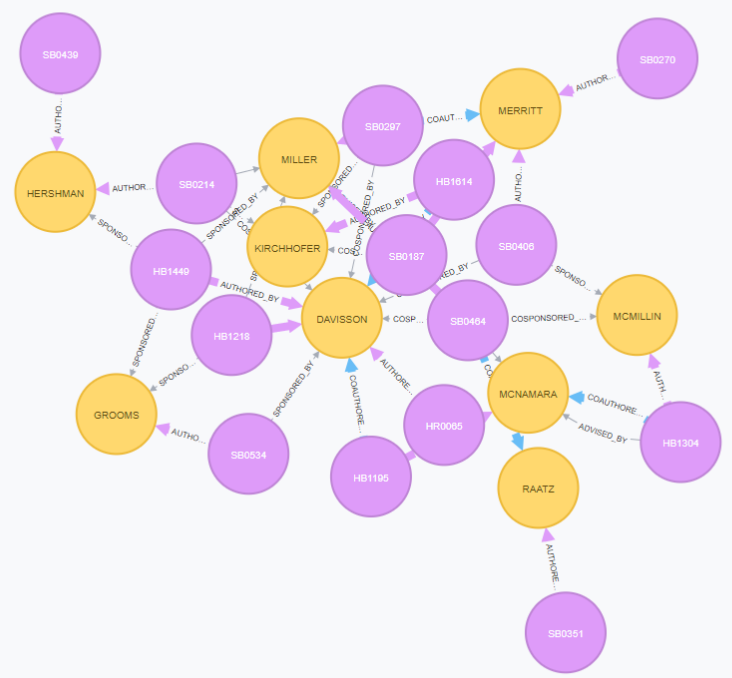
a.name	b.fullname	b.party
HB1218	REPRESENTATIVE STEVEN DAVISSON	Republican
HB1195	REPRESENTATIVE WENDY MCNAMARA	Republican
HB1304	REPRESENTATIVE JUD MCMILLIN	Republican
HB1449	REPRESENTATIVE STEVEN DAVISSON	Republican
HB1614	REPRESENTATIVE CINDY KIRCHHOFER	Republican
SB0406	SENATOR JAMES MERRITT	Republican
SB0439	SENATOR BRANDT HERSHMAN	Republican
SB0464	SENATOR PATRICIA MILLER	Republican
SB0534	SENATOR RONALD GROOMS	Republican
HR0065	REPRESENTATIVE STEVEN DAVISSON	Republican
SB0187	SENATOR JAMES MERRITT	Republican
SB0214	SENATOR BRANDT HERSHMAN	Republican
SB0270	SENATOR JAMES MERRITT	Republican
SB0297	SENATOR PATRICIA MILLER	Republican
SB0351	SENATOR JEFF RAATZ	Republican

Returned 15 records in 45 ms.




```
$ MATCH (a:bill)-[:AUTHORED_BY]->(b:legislator) WHERE a.digest CONTAINS 'opioid' RETURN a, b
```

(24) bill(15) legislator(9)
(39) ADVISED_BY(3) AUTHORED_BY(15) COAUTHORED_BY(5) COSPONSORED_BY(6) SPONSORED_BY(10)



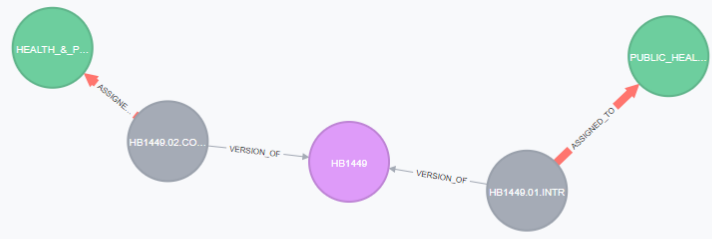
Displaying 24 nodes, 39 relationships (completed with 39 additional relationships).

AUTO-COMPLETE ON



```
$ MATCH (a:bill{name:'HB1449'})-[]-(b:bill_version)-[]-(c:standing_committee) WHERE a.year = '2015' RETURN a, b, c
```

* (5) bill(1) bill_version(2) standing_committee(2)
* (4) ASSIGNED_TO(2) VERSION_OF(2)



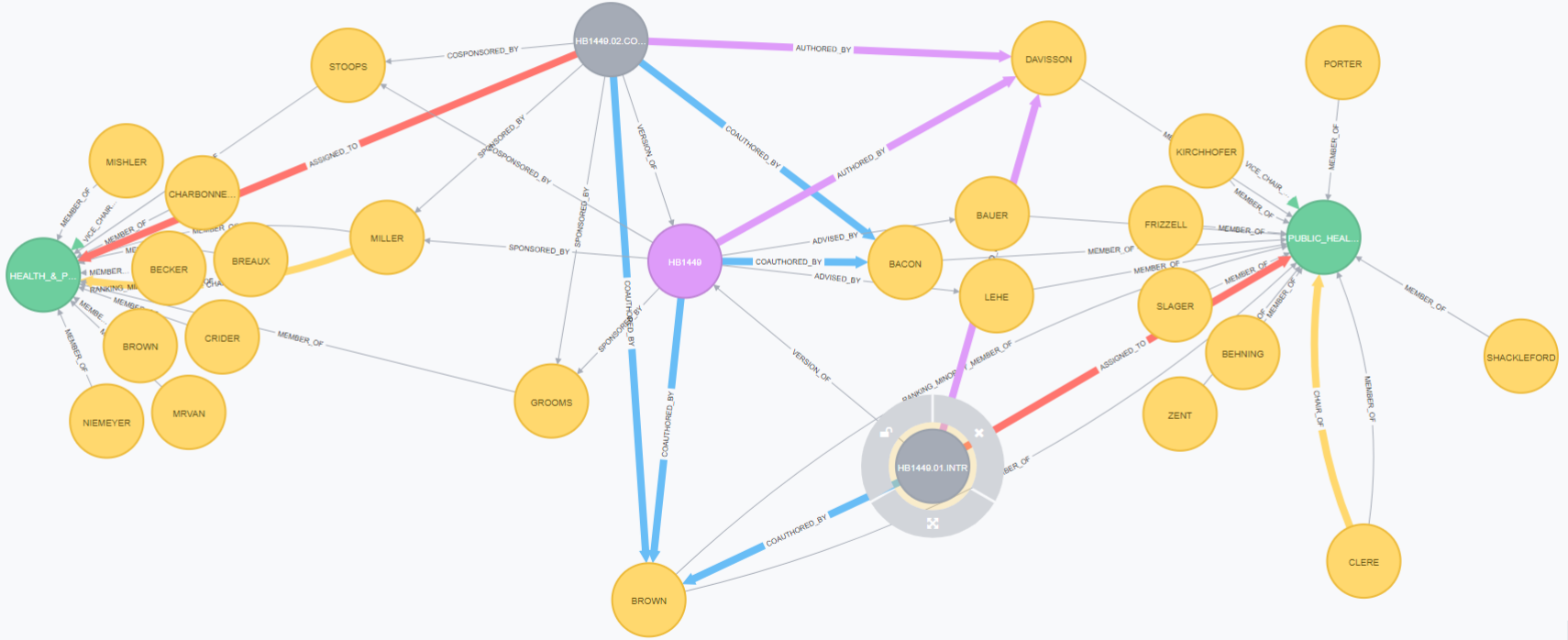
Displaying 5 nodes, 4 relationships (completed with 4 additional relationships).

AUTO-COMPLETE ON



```
$ MATCH (a:bill{name:'HB1449'})-[]-(b:bill_version)-[]-(c:standing_committee)-[:MEMBER_OF]-(d:legislator) WHERE a.year = '2015' RETURN a, b, c, d
```

- *(29) bill(1) bill_version(2) legislator(24) standing_committee(2)
- *(50) ADVISED_BY(2) ASSIGNED_TO(2) AUTHORED_BY(3) CHAIR_OF(2) COAUTHORED_BY(5) COSPONSORED_BY(2) MEMBER_OF(24) RANKING_MINORITY_MEMBER_OF(2) SPONSORED_BY(4) VERSION_OF(2) VICE_CHAIR_OF(2)



bill_version <id>: 1863 short_description: Opioid treatment programs in community mental health centers. sponsor: NA coauthor: REPRESENTATIVE CHARLIE BROWN, REPRESENTATIVE TIMOTHY BROWN year: 2015 author: REPRESENTATIVE STEVEN DAVISSON



```
$ MATCH (a:bill) WHERE a.digest CONTAINS 'opioid' RETURN 'Opioid' as Label, COU...
```

Label	COUNT
Opioid	15
Addiction	26
Substance Abuse	8

Returned 3 records in 66 ms.



Web Applications

<https://mhutchinson.shinyapps.io/guild/>

What next?



Indiana University
Network Science Institute

Thank You

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