



Automated Methods to Improve Legal Coding Assessment

Aishwarya Raj, Preceptor: Michael Pella - Evaluation Team

Presentation Agenda



Introduction



Research Idea



Methods



Findings



Takeaways

Introduction & Background



Aishwarya Raj



Bio: 2nd year Phd Student - University of Washington, Biomedical Health Informatics & Data Science



Background: B.S. Biochemistry from University of Illinois & M.S. in Law from Northwestern University

Research Themes: Public Health, Healthcare Access, NLP & Spatial Analysis

What is Legal Epidemiology

LEGAL EPIDEMIOLOGY IN PRACTICE: SIX STEPS



1. Engage

Identify a public health problem or a policy of interest through feedback from the community, subject matter experts, and policymakers.



2. Identify research needs

Review existing research and identify gaps to inform new research on laws and policies.



3. Create legal data

Conduct a legal mapping study to create empirical legal data that can be compared across jurisdictions and over time.



4. Analyze

Complete a legal evaluation study to analyze the relationship between law and health using empirical legal data linked to outcome data.



5. Translate

Publish and communicate findings to inform public health practice, decision-making, and public knowledge via agencies, academia, decision-makers, advocates, media, and the public.



6. Monitor and repeat

Continue monitoring and measuring legal changes and engaging with the community and stakeholders about the impact of laws, repeating previous steps as legal changes arise.

Fellowship Project



Research Aim: How do automated computational methods of legal coding compare to manual legal coding methods?

Research Question 1: What is the observed consistency across all human legal coding approaches ?

Research Question 2: What level of consistency is observed between the answers validated by humans versus computational methods?

Prior Work

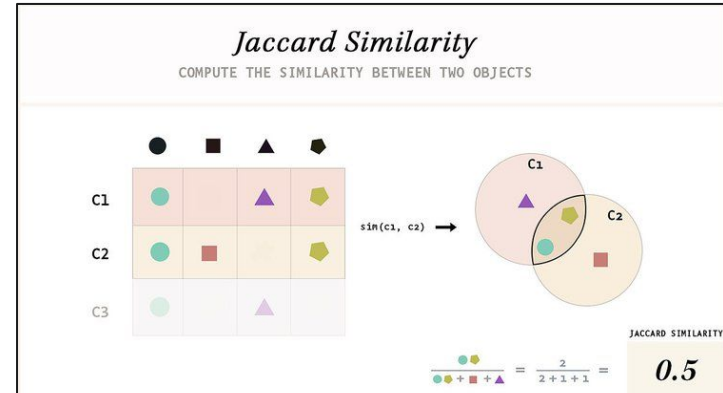
Automation in the Legal Space

- Mainly utilized in contract law
 - Litigation
 - Templatized text
 - Drafting of documents
- Opportunities:
 - Case Law
 - Scope & Relevance Search

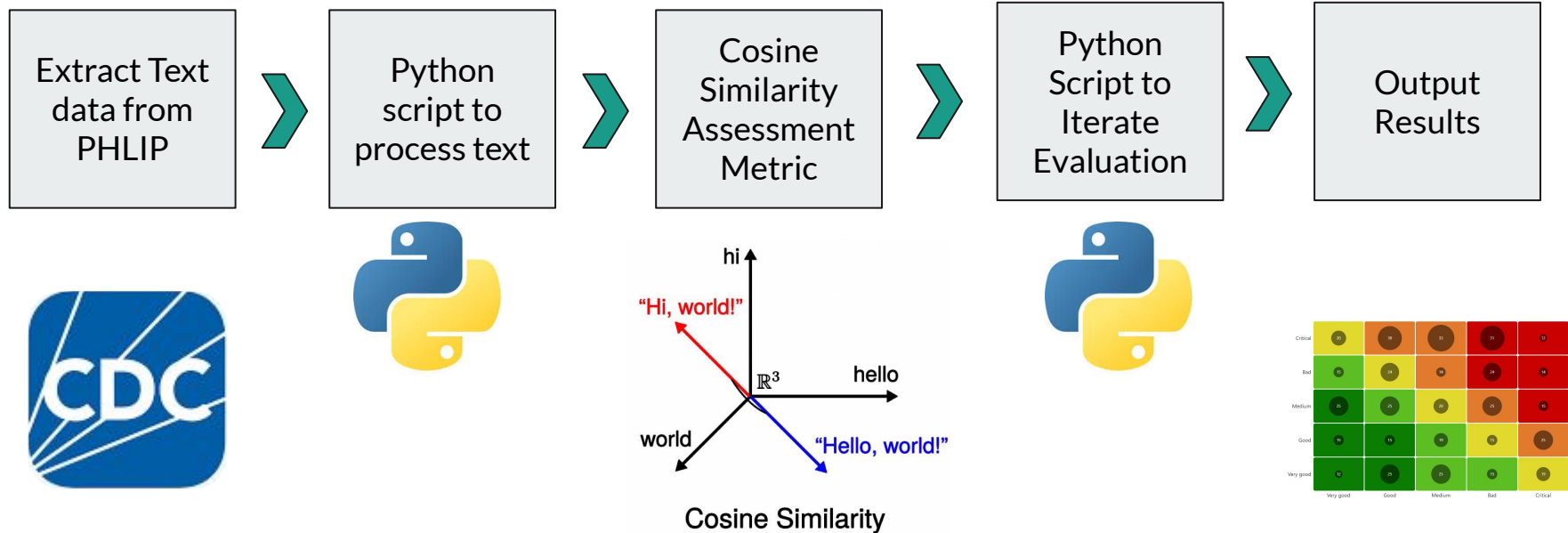
Harvey

Metrics Utilized

- Interrater Reliability
- Jaccard similarity scoring
- Sørensen–Dice coefficient
- Levenshtein distance



Methodology - RQ 1



Text considerations

jurisdiction	fips	gnis	start_date	end_date	q1	q1 pincite	q1 annota
Alabama (state)	1	1779775					
Alaska (state)	2	1785533					
Arizona (state)	4	1779777					
Arkansas (state)	5	68085					
California (state)	6	1779778					
Colorado (state)	8	1779779					
Connecticut (state)	9	1779780					
Delaware (state)	10	1779781					
Florida (state)	12	294478					
Georgia (state)	13	1705317					
Hawaii (state)	15	1779782					
Idaho (state)	16	1779783					
Illinois (state)	17	1779784					
Indiana (state)	18	448508					
Iowa (state)	19	1779785					
Kansas (state)	20	481813					
Kentucky (state)	21	1779786					
Louisiana (state)	22	1629543					
Maine (state)	23	1779787					
Maryland (state)	24	1714934					
Massachusetts (state)	25	606926					
Michigan (state)	26	1779789					
Minnesota (state)	27	662849					
Mississippi (state)	28	1779790					
Missouri (state)	29	1779791					
Montana (state)	30	767982					
Nebraska (state)	31	1779792					
Nevada (state)	32	1779793					
New Hampshire (state)	33	1779794					
New Jersey (state)	34	1779795					
New Mexico (state)	35	897535					
New York (state)	36	1779796					
North Carolina (state)	37	1027616					

We generally need to mask text that is expected to be present in every coder's data, for example the data template in this case. We can't get mask accuracy to be 100%, that is remove all templated text from similarity assessment but we can get pretty close.

Coding Scheme [Snippet]

Question number	Variable label	Question type	Question text	Value label
1	q1	Binary	Does the state/territorial law designate a state medical examiner (ME) office or authority?	Yes
1	q1	Binary	Does the state/territorial law designate a state medical examiner (ME) office or authority?	No
1.1	q1c1	Radio Button	If yes, is the state/territorial ME elected or appointed?	Elected
1.1	q1c1	Radio Button	If yes, is the state/territorial ME elected or appointed?	Appointed
1.1	q1c1	Radio Button	If yes, is the state/territorial ME elected or appointed?	N/A
1.1.1	q1c1c1_a1	Checkbox	If appointed, who has the authority to appoint the state/territorial ME?	Governor
1.1.1	q1c1c1_a1	Checkbox	If appointed, who has the authority to appoint the state/territorial ME?	[blank]
1.1.1	q1c1c1_a2	Checkbox	If appointed, who has the authority to appoint the state/territorial ME?	Commission or board
1.1.1	q1c1c1_a2	Checkbox	If appointed, who has the authority to appoint the state/territorial ME?	[blank]
1.1.1	q1c1c1_a3	Checkbox	If appointed, who has the authority to appoint the state/territorial ME?	Lead/head of state agency
1.1.1	q1c1c1_a3	Checkbox	If appointed, who has the authority to appoint the state/territorial ME?	[blank]
1.1.1	q1c1c1_a4	Checkbox	If appointed, who has the authority to appoint the state/territorial ME?	Other
1.1.1	q1c1c1_a4	Checkbox	If appointed, who has the authority to appoint the state/territorial ME?	[blank]
1.1.1	q1c1c1_a5	Checkbox	If appointed, who has the authority to appoint the state/territorial ME?	N/A
1.1.1	q1c1c1_a5	Checkbox	If appointed, who has the authority to appoint the state/territorial ME?	[blank]
1.2	q1c2_a1	Checkbox	If yes, within which department or entity is the state/territorial ME's office situated?	Law enforcement
1.2	q1c2_a1	Checkbox	If yes, within which department or entity is the state/territorial ME's office situated?	[blank]
1.2	q1c2_a2	Checkbox	If yes, within which department or entity is the state/territorial ME's office situated?	Health (e.g., department of health, public health, health and human services)
1.2	q1c2_a2	Checkbox	If yes, within which department or entity is the state/territorial ME's office situated?	[blank]
1.2	q1c2_a3	Checkbox	If yes, within which department or entity is the state/territorial ME's office situated?	Homeland security
1.2	q1c2_a3	Checkbox	If yes, within which department or entity is the state/territorial ME's office situated?	[blank]
1.2	q1c2_a4	Checkbox	If yes, within which department or entity is the state/territorial ME's office situated?	Academic institution
1.2	q1c2_a4	Checkbox	If yes, within which department or entity is the state/territorial ME's office situated?	[blank]
1.2	q1c2_a5	Checkbox	If yes, within which department or entity is the state/territorial ME's office situated?	Independent
1.2	q1c2_a5	Checkbox	If yes, within which department or entity is the state/territorial ME's office situated?	[blank]
1.2	q1c2_a6	Checkbox	If yes, within which department or entity is the state/territorial ME's office situated?	Other
1.2	q1c2_a6	Checkbox	If yes, within which department or entity is the state/territorial ME's office situated?	[blank]
1.3	q1c3	Binary	Does the law limit the length of the state/territorial ME's term in office?	Yes
1.3	q1c3	Binary	Does the law limit the length of the state/territorial ME's term in office?	No
1.3.1	q1c3c1	Text Field	If yes, what is the term length?	[text]

Scope of Final Question Set

Question #	Question Type	Question Text	Value Label
Q1	Binary	Does the state/territorial law designate a state medical examiner(ME) office or authority?	yes/no
Q1C3	Binary	Does the law limit the length of the state/territorial ME's term in office?	yes/no
Q2	Binary	Does the law designate a local level medicolegal death investigation auhtority or office?	yes/no
Q2C2	Binary	Does the law limit the length of the local death investigation authority's term in office?	yes/no
Q3	Binary	Does the law expressly require medicolegal death investigation offices to be accredited?	yes/no
Q4	Binary	Does the law specify education or qualification requirements for death investigation authorities?	yes/no
Q5	Binary	Does the law require continuing education or training while in office?	yes/no
Q6	Binary	Does the law authorize the lead medicolegal death investigation authority (or other government entity) to appoint or designate deputies?	yes/no

Q1 Text Sampling Comparison

Coder 1

	A	B	C	D	E	F	G	H
1	jurisdiction	fips	gnis	start_date	end_date	q1	q1 pincode	q1 annotation

3	South Carolina (state)	45	1779799	2/4/2022	2/28/2022	No		
4	South Dakota (state)	46	1785634	2/4/2022	2/28/2022	NA		

4	Tennessee (state)	47	1325873	2/4/2022	2/28/2022	Yes	T.C.A. § 38-7-102; T.C.A. § 38-7-103	Document: 052 - Section 38-7-102 Postmortem examination division.doc - The department of health is authorized and empowered to create and maintain a post-mortem examination division or service. - hall appoint a chief medical examiner to direct the division or service. Document: 053 - Section 38-7-103 Chief medical examiner - deputies.doc - (a) The chief medical examiner shall be a physician with an unlimited license to practice medicine and surgery in the state of Tennessee, or who is qualified and eligible for such license, and shall be required to obtain a license within the six-month period after employment. The chief medical examiner shall be a pathologist who is certified by the American Board of Pathology and who holds a certificate of competency in forensic pathology. In addition to the chief medical examiner's administrative duties, the chief medical examiner's educational duties shall include developing and providing instructing and regular continuing education to all county medical examiners and medical investigators. The chief medical examiner shall be appointed to a five-year term, and may serve unlimited consecutive terms.
44	Texas (state)	48	1779801	2/4/2022	2/28/2022	NA		
45	Utah (state)	49	1450989	2/4/2022	2/28/2022	NA		
46	Vermont (state)	50	1779802	2/4/2022	2/28/2022	NA		
47	Virginia (state)	51	1779803	2/4/2022	2/28/2022	NA		

4	Washington (state)	53	1779804	2/4/2022	2/28/2022	NA		Document: 199 - Section 5-1402 Establishment of the Office of the Chief Medical.doc - There is established as a subordinate agency in the Executive branch of the District government, the Office of the Chief Medical Examiner. Document: 39 - 5000 GENERAL PROVISIONS.doc - There is established as a subordinate agency in the executive branch of the government of the District of Columbia the Office of the Chief Medical Examiner ("OCME")
4	Washington, DC	11	1702382	2/4/2022	2/28/2022	Yes	DC ST § 5-1402(a); 28 DCMR § 5000(5000.1)	

jurisdiction	fips	gnis	start_date	end_date	q1	q1 pincode	q1 annotation
South Carolina (state)	45	1779799	2/4/2022	2/28/2022	No		
South Dakota (state)	46	1785634	2/4/2022	2/28/2022	NA		

jurisdiction	fips	gnis	start_date	end_date	q1	q1 pincode	q1 annotation
South Carolina (state)	45	1779799	2/4/2022	2/28/2022	No		
South Dakota (state)	46	1785634	2/4/2022	2/28/2022	NA		

4	Tennessee (state)	47	1325873	2/4/2022	2/28/2022	Yes	T.C.A. § 38-7-102	Document: 052 - Section 38-7-102 Postmortem examination division.doc - The department of health is authorized and empowered to create and maintain
48	Texas (state)	48	1779801	2/4/2022	2/28/2022	NA		
49	Utah (state)	49	1450989	2/4/2022	2/28/2022	NA		
50	Vermont (state)	50	1779802	2/4/2022	2/28/2022	NA		
51	Virginia (state)	51	1779803	2/4/2022	2/28/2022	NA		
53	Washington (state)	53	1779804	2/4/2022	2/28/2022	NA		

4	Washington (state)	53	1779804	2/4/2022	2/28/2022	NA		Document: 199 - Section 5-1402 Establishment of the Office of the Chief Medical.doc - There is established as a subordinate agency in the Executive branch of the District government, the Office of the Chief Medical Examiner. Document: 39 - 5000 GENERAL PROVISIONS.doc - There is established as a subordinate agency in the executive branch of the government of the District of Columbia the Office of the Chief Medical Examiner ("OCME")
4	Washington, DC	11	1702382	2/4/2022	2/28/2022	Yes	DC ST § 5-1402(a); 28 DCMR § 5000(5000.1)	

Coder 3

Coder 2

jurisdiction	fips	gnis	start_date	end_date	q1	q1 pincode	q1 annotation
Colorado (state)	8	1779779	2/4/2022	2/28/2022	No		Document: 54-S-CX3.DOC - (a) The Chief Medical Examiner shall investigate all human deaths in the following categories: Document: 11 - Sec 19a-401-1 Definitions.doc - (b) "Office" means the Office of the Chief Medical Examiner.
Connecticut (state)	9	1779780	2/4/2022	2/28/2022	Yes	C.G.S.A. § 19a-401-1	
Delaware (state)	10	1779781	2/4/2022	2/28/2022	NA		
Florida (state)	12	294478	2/4/2022	2/28/2022	NA		
Georgia (state)	13	1705317	2/4/2022	2/28/2022	NA		
Hawaii (state)	15	1779782	2/4/2022	2/28/2022	NA		
Idaho (state)	16	1779783	2/4/2022	2/28/2022	NA		
Illinois (state)	17	1779784	2/4/2022	2/28/2022	NA		
Indiana (state)	18	448508	2/4/2022	2/28/2022	NA		
Iowa (state)	19	1779785	2/4/2022	2/28/2022	NA		
Kansas (state)	20	481813	2/4/2022	2/28/2022	NA		

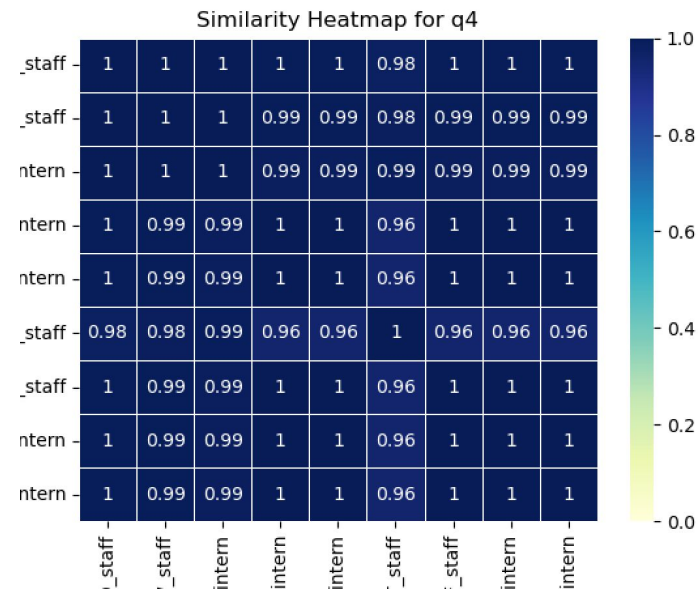
4	Kentucky (state)	21	1779786	2/4/2022	2/28/2022	Yes	KRS § 12.0200(1)(b); KRS § 11	Document: 007 - 10200 Enumeration of departments program cabinets and administrative - (h) Office of the Kentucky State Medical Examiner. Document: 009 - 15A020 Organization of Justice and Public Safety Cabinet.doc - (h) Office of the Kentucky State Medical Examiner. Document: 064 - 72210 Purpose of Office of the Kentucky State Medical Examiner.doc - establishing an Office of the Kentucky State Medical Examiner for the Commonwealth of Kentucky
4	Louisiana (state)	22	1629543	2/4/2022	2/28/2022	NA		
4	Maine (state)	23	1779787	2/4/2022	2/28/2022	NA		

4	Kentucky (state)	21	1779786	2/4/2022	2/28/2022	Yes	KRS § 12.0200(1)(b); KRS § 11	Document: 007 - 10200 Enumeration of departments program cabinets and administrative - (h) Office of the Kentucky State Medical Examiner. Document: 009 - 15A020 Organization of Justice and Public Safety Cabinet.doc - (h) Office of the Kentucky State Medical Examiner. Document: 064 - 72210 Purpose of Office of the Kentucky State Medical Examiner.doc - establishing an Office of the Kentucky State Medical Examiner for the Commonwealth of Kentucky
4	Louisiana (state)	22	1629543	2/4/2022	2/28/2022	NA		
4	Maine (state)	23	1779787	2/4/2022	2/28/2022	NA		
4	Maryland (state)	24	1714934	2/4/2022	2/28/2022	Yes	MD Code, Health - General, § 5-1402(a); 28 DCMR § 5000(5000.1)	Document: 43 - Section 5-305 Commission staff.doc - (a)(1) The Commission may employ a staff in accordance with the State budget for the fiscal year beginning on July 1 of each year.
4	Massachusetts (state)	25	606926	2/4/2022	2/28/2022	NA		

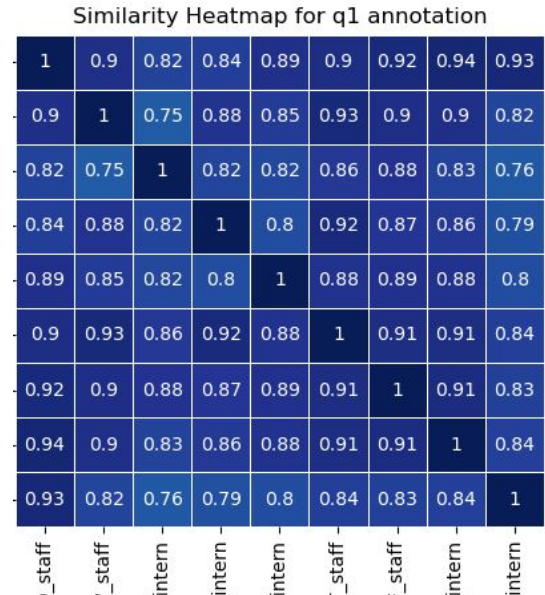
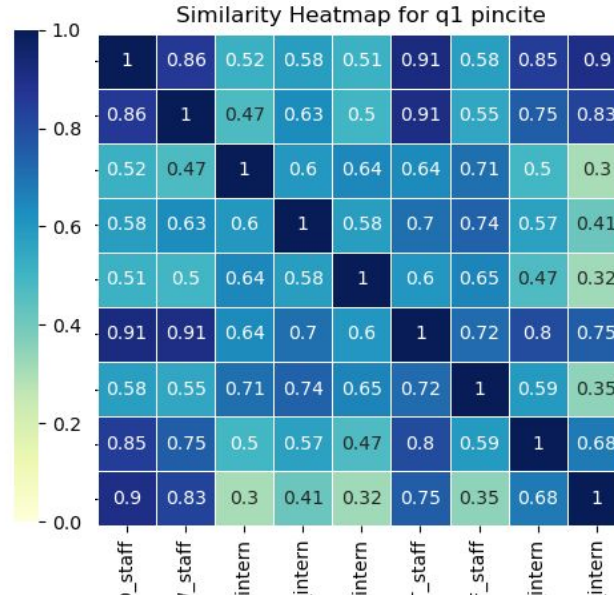
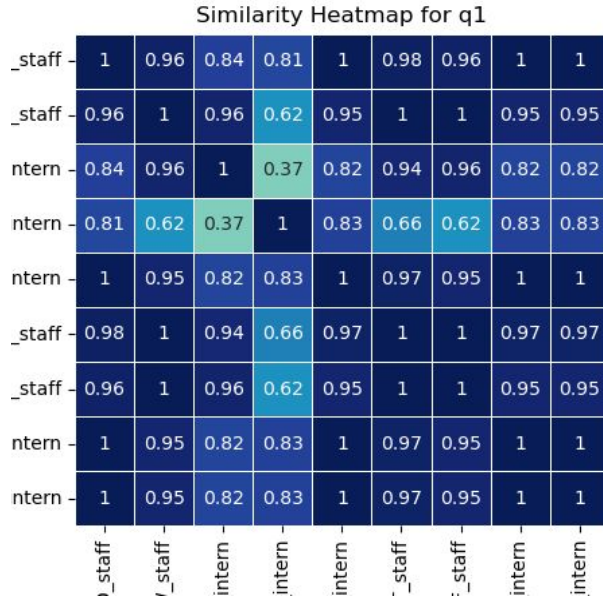
1	jurisdiction	fips	gnis	start_date	end_date	q1	q1 pincode	q1 annotation
18	Kentucky (state)	21	1779786	2/4/2022	2/28/2022	Yes	KRS § 12.0200(1)(b); KRS § 11	Document: 007 - 10200 Enumeration of departments program cabinets and administrative - (h) Office of the Kentucky State Medical Examiner. Document: 009 - 15A020 Organization of Justice and Public Safety Cabinet.doc - (h) Office of the Kentucky State Medical Examiner. Document: 064 - 72210 Purpose of Office of the Kentucky State Medical Examiner.doc - establishing an Office of the Kentucky State Medical Examiner for the Commonwealth of Kentucky
18	Louisiana (state)	22	1629543	2/4/2022	2/28/2022	NA		
21	Maine (state)	23	1779787	2/4/2022	2/28/2022	NA		

21	Kentucky (state)	21	1779786	2/4/2022	2/28/2022	Yes	KRS § 12.0200(1)(b); KRS § 11	Document: 007 - 10200 Enumeration of departments program cabinets and administrative - (h) Office of the Kentucky State Medical Examiner. Document: 009 - 15A020 Organization of Justice and Public Safety Cabinet.doc - (h) Office of the Kentucky State Medical Examiner. Document: 064 - 72210 Purpose of Office of the Kentucky State Medical Examiner.doc - establishing an Office of the Kentucky State Medical Examiner for the Commonwealth of Kentucky
21	Louisiana (state)	22	1629543	2/4/2022	2/28/2022	NA		
21	Maine (state)	23	1779787	2/4/2022	2/28/2022	NA		
21	Maryland (state)	24	1714934	2/4/2022	2/28/2022	Yes	MD Code, Health - General, § 5-1402(a); 28 DCMR § 5000(5000.1)	Document: 43 - Section 5-305 Commission staff.doc - (a)(1) The Commission may employ a staff in accordance with the State budget for the fiscal year beginning on July 1 of each year.

Coding Pattern Variation

[illegible]

Results Part 1 - Coder Consistency Evaluation



Coder Results - Questions

Subset Q	coder_1_staff	coder_2_staff	coder_3_intern	coder_4_intern	coder_5_intern	coder_6_staff	coder_7_staff	coder_8_intern	coder_9_intern
coder_1_staff	1±0	0.94±0.11	0.97±0.05	0.8±0.18	0.92±0.14	0.95±0.1	0.92±0.17	0.96±0.05	0.96±0.08
coder_2_staff	0.94±0.11	1±0	0.95±0.09	0.76±0.22	0.95±0.06	1±0	0.98±0.04	0.88±0.22	0.96±0.07
coder_3_intern	0.97±0.05	0.95±0.09	1±0	0.68±0.23	0.87±0.12	0.96±0.08	0.92±0.15	0.95±0.06	0.92±0.08
coder_4_intern	0.8±0.18	0.76±0.22	0.68±0.23	1±0	0.88±0.18	0.79±0.18	0.77±0.22	0.67±0.26	0.85±0.19
coder_5_intern	0.92±0.14	0.95±0.06	0.87±0.12	0.88±0.18	1±0	0.95±0.04	0.95±0.07	0.81±0.27	0.98±0.02
coder_6_staff	0.95±0.1	1±0	0.96±0.08	0.79±0.18	0.95±0.04	1±0	0.98±0.02	0.89±0.2	0.97±0.04
coder_7_staff	0.92±0.17	0.98±0.04	0.92±0.15	0.77±0.22	0.95±0.07	0.98±0.02	1±0	0.84±0.28	0.98±0.02
coder_8_intern	0.96±0.05	0.88±0.22	0.95±0.06	0.67±0.26	0.81±0.27	0.89±0.2	0.84±0.28	1±0	0.86±0.2
coder_9_intern	0.96±0.08	0.96±0.07	0.92±0.08	0.85±0.19	0.98±0.02	0.97±0.04	0.98±0.02	0.86±0.2	1±0
Subset Questions: Q1, Q1C3, Q3, Q2, Q2C2, Q3, Q4									
AllQ	coder_1_staff	coder_2_staff	coder_3_intern	coder_4_intern	coder_5_intern	coder_6_staff	coder_7_staff	coder_8_intern	coder_9_intern
coder_1_staff	0.81±0.39	0.64±0.46	0.58±0.48	0.58±0.46	0.68±0.45	0.72±0.43	0.72±0.42	0.7±0.44	0.57±0.48
coder_2_staff	0.64±0.46	0.69±0.46	0.5±0.49	0.49±0.47	0.62±0.47	0.68±0.46	0.61±0.47	0.59±0.47	0.49±0.49
coder_3_intern	0.58±0.48	0.5±0.49	0.62±0.49	0.4±0.45	0.53±0.47	0.54±0.48	0.58±0.47	0.53±0.48	0.43±0.48
coder_4_intern	0.58±0.46	0.49±0.47	0.4±0.45	0.67±0.47	0.54±0.48	0.55±0.46	0.55±0.46	0.5±0.46	0.46±0.47
coder_5_intern	0.68±0.45	0.62±0.47	0.53±0.47	0.54±0.48	0.74±0.44	0.64±0.46	0.65±0.46	0.61±0.46	0.49±0.5
coder_6_staff	0.72±0.43	0.68±0.46	0.54±0.48	0.55±0.46	0.64±0.46	0.76±0.43	0.68±0.45	0.6±0.47	0.51±0.49
coder_7_staff	0.72±0.42	0.61±0.47	0.58±0.47	0.55±0.46	0.65±0.46	0.68±0.45	0.83±0.37	0.61±0.47	0.51±0.49
coder_8_intern	0.7±0.44	0.59±0.47	0.53±0.48	0.5±0.46	0.61±0.46	0.6±0.47	0.61±0.47	0.71±0.45	0.52±0.48
coder_9_intern	0.57±0.48	0.49±0.49	0.43±0.48	0.46±0.47	0.49±0.5	0.51±0.49	0.51±0.49	0.52±0.48	0.6±0.49

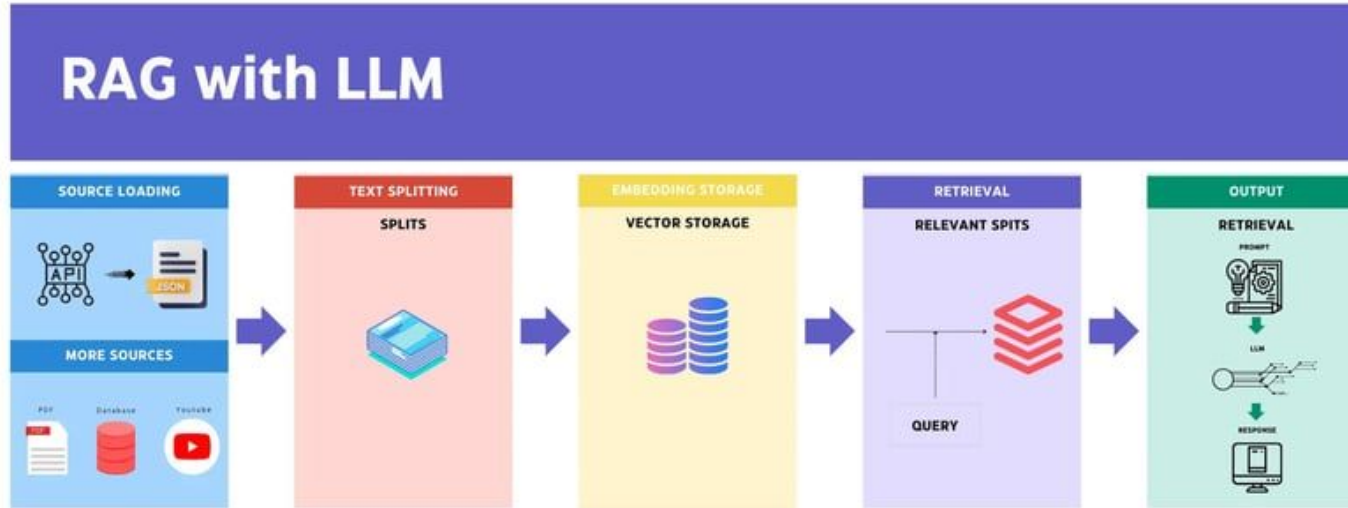
The subset question evaluation have higher agreement scores and lower variance

There is also more agreement between staffers

Coder Results - Pincites and Annotations

Pincites	coder_1_staff	coder_2_staff	coder_3_intern	coder_4_intern	coder_5_intern	coder_6_staff	coder_7_staff	coder_8_intern	coder_9_intern
coder_1_staff	0.76±0.43	0.35±0.35	0.25±0.27	0.2±0.22	0.25±0.23	0.5±0.4	0.32±0.28	0.57±0.41	0.41±0.4
coder_2_staff	0.35±0.35	0.64±0.48	0.19±0.24	0.19±0.23	0.2±0.21	0.55±0.42	0.26±0.26	0.3±0.33	0.26±0.34
coder_3_intern	0.25±0.27	0.19±0.24	0.55±0.5	0.18±0.24	0.23±0.26	0.26±0.3	0.35±0.38	0.2±0.24	0.19±0.26
coder_4_intern	0.2±0.22	0.19±0.23	0.18±0.24	0.57±0.49	0.19±0.23	0.22±0.25	0.25±0.28	0.16±0.2	0.14±0.19
coder_5_intern	0.25±0.23	0.2±0.21	0.23±0.26	0.19±0.23	0.67±0.47	0.25±0.25	0.32±0.3	0.2±0.19	0.15±0.2
coder_6_staff	0.5±0.4	0.55±0.42	0.26±0.3	0.22±0.25	0.25±0.25	0.74±0.44	0.34±0.3	0.34±0.33	0.28±0.33
coder_7_staff	0.32±0.28	0.26±0.26	0.35±0.38	0.25±0.28	0.32±0.3	0.34±0.3	0.81±0.39	0.25±0.24	0.21±0.26
coder_8_intern	0.57±0.41	0.3±0.33	0.2±0.24	0.16±0.2	0.2±0.19	0.34±0.33	0.25±0.24	0.67±0.47	0.29±0.32
coder_9_intern	0.41±0.4	0.26±0.34	0.19±0.26	0.14±0.19	0.15±0.2	0.28±0.33	0.21±0.26	0.29±0.32	0.52±0.5
Annotations	coder_1_staff	coder_2_staff	coder_3_intern	coder_4_intern	coder_5_intern	coder_6_staff	coder_7_staff	coder_8_intern	coder_9_intern
coder_1_staff	0.76±0.4	0.45±0.39	0.4±0.5	0.34±0.3	0.49±0.35	0.55±0.41	0.54±0.4	0.62±0.39	0.45±0.37
coder_2_staff	0.45±0.32	0.64±0.36	0.34±0.3	0.33±0.49	0.4±0.31	0.58±0.35	0.47±0.33	0.42±0.32	0.34±0.3
coder_3_intern	0.4±0.37	0.34±0.36	0.55±0.35	0.23±0.31	0.35±0.46	0.39±0.37	0.41±0.37	0.36±0.37	0.3±0.35
coder_4_intern	0.34±0.42	0.33±0.44	0.23±0.41	0.57±0.35	0.29±0.37	0.35±0.44	0.33±0.39	0.3±0.41	0.25±0.39
coder_5_intern	0.49±0.39	0.4±0.41	0.35±0.4	0.29±0.33	0.69±0.37	0.43±0.39	0.45±0.39	0.45±0.41	0.32±0.4
coder_6_staff	0.55±0.44	0.58±0.4	0.39±0.39	0.35±0.32	0.43±0.37	0.74±0.41	0.53±0.41	0.45±0.47	0.36±0.38
coder_7_staff	0.54±0.43	0.47±0.38	0.41±0.37	0.33±0.3	0.45±0.35	0.53±0.39	0.81±0.4	0.48±0.38	0.37±0.5
coder_8_intern	0.62±0	0.42±0	0.36±0	0.3±0	0.45±0	0.45±0	0.48±0	0.67±0	0.37±0
coder_9_intern	0.45±0	0.34±0	0.3±0	0.25±0	0.32±0	0.36±0	0.37±0	0.37±0	0.52±0

Methodology - RQ 2



Key Considerations

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Privacy

Legal Language

Accuracy

Results Part 2 - Automated Coding Comparison

PRELIMINARY RAG TESTS:

BINARY QUESTIONS

ALABAMA - QUESTION1: Does the state/territorial law designate a state medical examiner (ME) office or authority?

Validated answer: No

RAG Answer:

```
Enter your question (or type 'exit' to quit): Does the state/territorial law designate a state medical examiner (ME) office or authority?
```

```
Based on the provided context, it appears that Alabama does not have a designated state-level Medical Examiner (ME) office or authority within the Alabama Coroners Training Commission. The definition provided for "Medical Examiner" is for a physician trained to perform postmortem examinations and investigate deaths from unnatural or suspicious causes, but there is no mention of a state-wide office or authority that oversees all medical examiners in the state. However, this does not necessarily mean that such an office or authority does not exist elsewhere within the Alabama government structure. Without further information about other possible sources of ME oversight in Alabama, it cannot be definitively confirmed whether there is a designated state-level ME office or authority or not.
```

PASSED

Results Part 2 - Automated Coding Comparison



Question 2: Does the law designate a local level medicolegal death investigation authority or office?

Validated Answer: Yes

RAG answer:

```
not.  
Enter your question (or type 'exit' to quit): Does the law designate a local level medicolegal death investigation authority or office please answer as yes or no  
Yes, based on the provided definitions, the Alabama Administrative Code does designate a local-level medicolegal death investigation authority, which is referred to as a "Coroner." A Coroner is a duly elected or appointed person, as described by Alabama state statute.
```

PASSED

Results Part 2 - Automated Coding Comparison

For Question 2: what are the documents and annotations supporting the previous answer?

```
Enter your question (or type 'exit' to quit): what are the documents and annotations supporting the previous answer?
The document and annotations supporting the definitions provided in your context can be found in the text file
only in two parts:

1. The first part is a rule from the Alabama Administrative Code (Ala. Admin. Code r. 235-X-1-.01) titled
   'Definitions of Terms Used by the Alabama Coroners Training Commission'.

2. The second part includes important details about the document itself:
   - Author: Bill Harris
   - Statutory Authority: Code of Ala. 1975, § 11-5-31. (This refers to the specific state law that gives
     rise to the rule.)
   - History: New Rule: Filed June 17, 2019; effective August 1, 2019. (These lines indicate when the rule
     became effective.)
   - Current through the September 30, 2021 Alabama Administrative Monthly. Some sections may be more current
     than others. Please check the Alabama Administrative Monthly for more information. The Rules of the Alabama
     Banking Department are not part of the Alabama Administrative Code. (These lines give information about the
     currency and applicability of the rule.)
   - Copyright (C) 2021 BY STATE OF ALABAMA. ALL RIGHTS RESERVED. (This is a copyright notice for the document.)

Enter your question (or type 'exit' to quit):
```

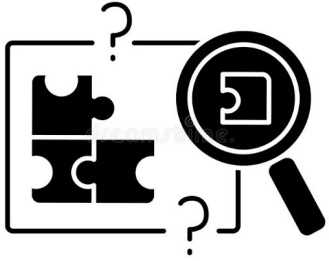
Validated Answer:

Pincite: Ala.Code 1975 § 11-5-1; Ala.Code 1975 § 45-27-60; Ala.Code 1975 § 45-49-171.73; Ala.Code 1975 § 45-49-171.60; Ala.Code 1975 § 45-37-60.09; Ala.Code 1975 § 45-37-60.01; Ala.Code 1975 § 45-49-171.61

Annotation:

Document: 03 - Section 11-5-1 Election - term of office.doc

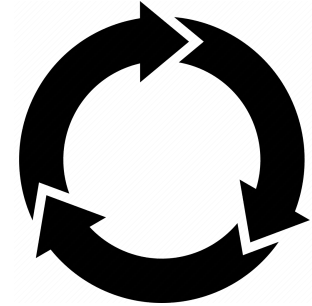
Challenges & Considerations



Data Gaps &
Text Documentation Size ex. VFC



Privacy e.g. RAG Design



Model Training

Takeaways



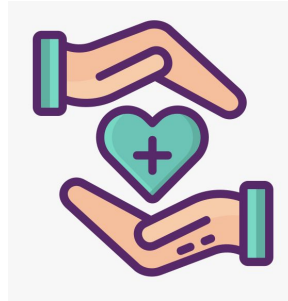
Future Expansion

- Model Fine Tuning
- Application to other legal coding projects
- Legal language model development
- Assessment for Relevancy
- **Automate interrater reliability calculations**

Deliverables

- Github repository with project code to be made reusable
 - Python script for coder consistency
 - Python script for RAG generation
- Project Write Up
- Results

Question or Comments?



Thank you!

Contact: araj3609@uw.edu
Aishwarya Raj