

Scott Renshaw
Heath Reineke
Knowledge and Representation
03/06/18
Term Project

1. An overview of your project, including your motivation for tackling it and how you scoped it.

Our project focused on building a knowledge base and rules for classification of a bill becoming a law in the United State's government for Companion Studio. Our motivation for this problem is that even though this is a process that affects all of us who live in the US a lot of people do not know this process and it can be quite confusing with having many different rules and regulations. We scoped our project by creating a set of attributes and rules for Companion Studio and then scraping data from the United State's Government websites that list bills and their status to create a knowledge base of bills to test our rules and attributes on.

2. A description of what you built. What reasoner did you use, what knowledge representation resources did you use? What did you get off the shelf, and what did you build?

We built a logic reasoner for these rules in Companion Studio as well as a scraper and parser to make the set of bills and laws for our rules to be tested on. Companion Studio already had the collections Bill-ProposedLaw, KilledBill-ProposedLaw and Law so we did not have to create these collections. We did create all the attributes for the items to describe the state of the Bill as well as the functions to classify these items. We also created the collection of BillIdea to represent ideas people have for bills, since all bills are first before anything ideas. We also built a scraper and parser to scrape the United State's Government websites for bill information as well as making them into a meld file format to be able to use in the knowledge base and query them.

3. Examples of your system in action, including screenshots and real output.

Output from scraping data for bills and saving it to create a base of examples

```

1 (isa s1379-112 Bill-Idea)
2 (writtenSponsored s1379-112)
3 (houseVoteResult s1379-112 True)
4 (senateVoteResult s1379-112 True)
5 (presidentSigned s1379-112)
6
7 (isa s1977-112 Bill-Idea)
8 (writtenSponsored s1977-112)
9
10 (isa s3278-112 Bill-Idea)
11 (writtenSponsored s3278-112)
12
13 (isa s2198-112 Bill-Idea)
14 (writtenSponsored s2198-112)
15
16 (isa s912-112 Bill-Idea)
17 (writtenSponsored s912-112)
18
19 (isa s2950-112 Bill-Idea)
20 (writtenSponsored s2950-112)
21
22 (isa s778-112 Bill-Idea)
23 (writtenSponsored s778-112)
24
25 (isa s2508-112 Bill-Idea)
26 (writtenSponsored s2508-112)
27
28 (isa s1983-112 Bill-Idea)
29 (writtenSponsored s1983-112)
30
31 (isa s3075-112 Bill-Idea)

```

End result was example document of roughly 35,000 lines long holding information from thousands of bills

Results from different queries using companion studio of things to see if they are bills, laws, or killed bills

Query / WM Fact Edit

```
(isa s1379-112 Law)
action = query
context = EverythingPSC; facts = all, env, infer
```

Answers:

in EverythingPSC:

?

A

(ist-Information EverythingPSC (isa s1379-112 Law))

[true]

Return to Query/Edit Page

Query / WM Fact Edit

```
(isa s572-112 Law)
  action = query
  context = EverythingPSC; facts = all, env, infer
```

Answers:

None found.

[Return to Query/Edit Page](#)

Query / WM Fact Edit

```
(isa s572-112 Bill-ProposedLaw)
  action = query
  context = EverythingPSC; facts = all, env, infer
```

Answers:

in EverythingPSC:

  (ist-Information EverythingPSC
(isa s572-112 Bill-ProposedLaw)) [true]



[Return to Query/Edit Page](#)

Query / WM Fact Edit

```
(isa hr1-100 Law)
  action = query
  context = EverythingPSC; facts = all, env, infer
```

Answers:

in EverythingPSC:

  (ist-Information EverythingPSC (isa hr1-100 Law)) [true]



[Return to Query/Edit Page](#)

Query / WM Fact Edit

```
(isa sres78-102 KilledBill-ProposedLaw)
  action = query
  context = EverythingPSC; facts = all, env, infer
```

Answers:

in EverythingPSC:

  (ist-Information EverythingPSC
(isa sres78-102 KilledBill-ProposedLaw)) [true]

[Return to Query/Edit Page](#)

4. A discussion of how you evaluated your system's performance – what are the relevant measures, and how did your system come out with regard to them?
We based our system on using the data set we scraped from the internet how well our queries came up with the correct classification versus an incorrect classification. We were able to achieve complete accuracy for the bill data we collected.

5. An evaluation of the project itself: What worked well, what didn't work well, and what might you have done differently.

The most important part of our project was having good and accurate different attributes for our system, but at the same time keeping the attributes broad and not too specific. By having these good attributes it made it easy to write the rules to classify the system, and by keeping them broad we were able to use them for different situation rather than having to have tons of overlap. The scraper and parser for the government website was extremely helpful because it allowed for us to generate a huge test data set for our rules.