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Knowledge and Representation  
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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 in Companion Studio and rules for classification of a bill becoming a law in the United State's government. 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 things possibly occurring. 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 website listing 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. 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 Congressional website for bill information as well as making them into a meld file 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:

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

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#### Query / WM Fact Edit

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

#### Answers:

in EverythingPSC:

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

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#### Query / WM Fact Edit

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

#### Answers:

in EverythingPSC:

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

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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.

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 broad and not extremely specific. By having these good attributes it made it easy to write the rules to classify the system, but many of them by making them slightly more complex were more versatile and could be used in many different situations. The scraper and parser for the government website was helpful because it allowed for us to quickly generate a large test base for our rules.