Interpreting Datalog

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What's a logic language?

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- Describes relationships
  - h(A, B)
  - mom(sally, elise)

- Uses rules and facts to define relationships
  - mom(sally, elise) .
  - h(A) :- b(A)
  - dad(A, B) :- son(B, A)

- Processes queries
  - Returns relationships based on rules and facts

Writing an Interpreter

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- Facts
  - `relationship(term1, term2) .`

- Queries
  - `relationship(A, B) ?`

- Rules
  - `relationship(A, B) :- (r2(B, C))`
  - `relationship(A, B) :- (r2(A,B) | r3(B,C))`
  - `relationship(A, B) :- (r2(A,B) & r3(B,C))`

Our Grammar

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```
prims ::= str                          term ::= q_lit
          var                                  (term | term)
                                               (term & term)
lit   ::= str(str, str)
q_lit ::= str(var|str, var|str)        lit  ::= lit .
                                               q_lit ?
                                               q_lit :- (term)
```

Demo + Code Walkthrough

———

```
                    Alice -- Bob
            _____|_____
            |              |              |
     Ivan -- Carl   Diane   Elise -- Fred
       ___|____                 ____|___
       |      |                 |      |
     Jimmy  Kendra            Greg   Helen
```

Evaluation

- Can define facts and rules
- Can query
- Nested inferences (kind of)

Stuff we could do

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- Full tree recursion
- Way better code practices
- Test nested ands/ors
- Queries don't have ands/ors