

3 – Founderism, AI, and Coding

Capitalism for Founders 101

Thinking like an Entrepreneur

Coding

Going deeper

AI

Lets get the conversation started



Are You on Github?

- Fill out Survey so we have all github repos
- We will be taking a look at your work and giving feedback through github!
- Github is a coders Instagram! You don't exist if you're not on it! :-D





Founderism

The mentality and culture that produces founders

Capitalism is like Farts

- No one really likes it
- Seems like we have to have it to survive
- We all kind of have to deal with it
- In practice, We kind of pretend that its ill effects doesn't exist (*In Practice*)



Human Nature

- The have nots seek to have

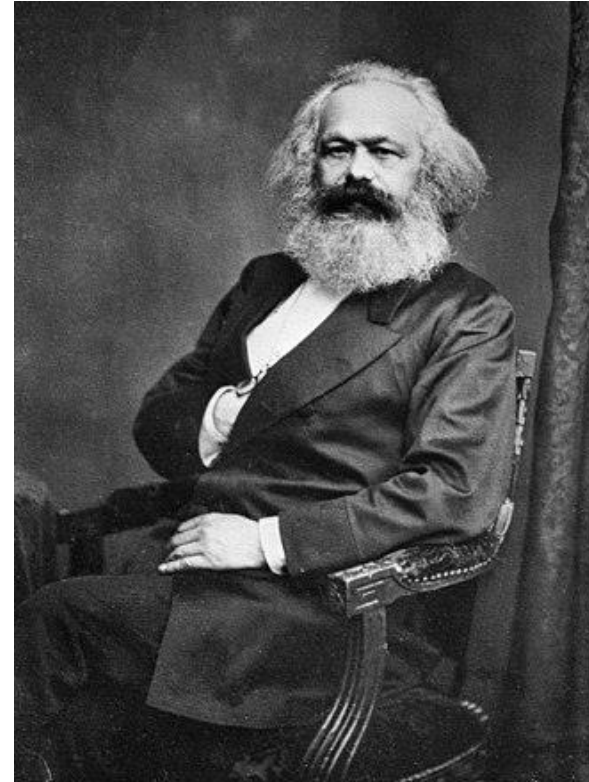


- Those who have seek to keep



Marx was on to something

- Karl Marx
 - German philosopher, critic of political economy, economist, historian, sociologist, political theorist, journalist and socialist revolutionary.
- Known as revolutionary, but really an academician and thinker
- Brilliant **Theories**
 - Not all, but many
- One very relevant to understanding the practice of our society...



Bourgeoisie vs Proletariat

- Proletariat
 - the term proletariat designated the class of wage workers who were engaged in industrial production and whose chief source of income was derived from the **sale of their labour power**.
- Working at a company
- Bourgeoisie
 - the bourgeoisie is the social class that came to **own the means of production** during modern industrialization and whose societal concerns are the value of property and the preservation of capital.
- Owning a company

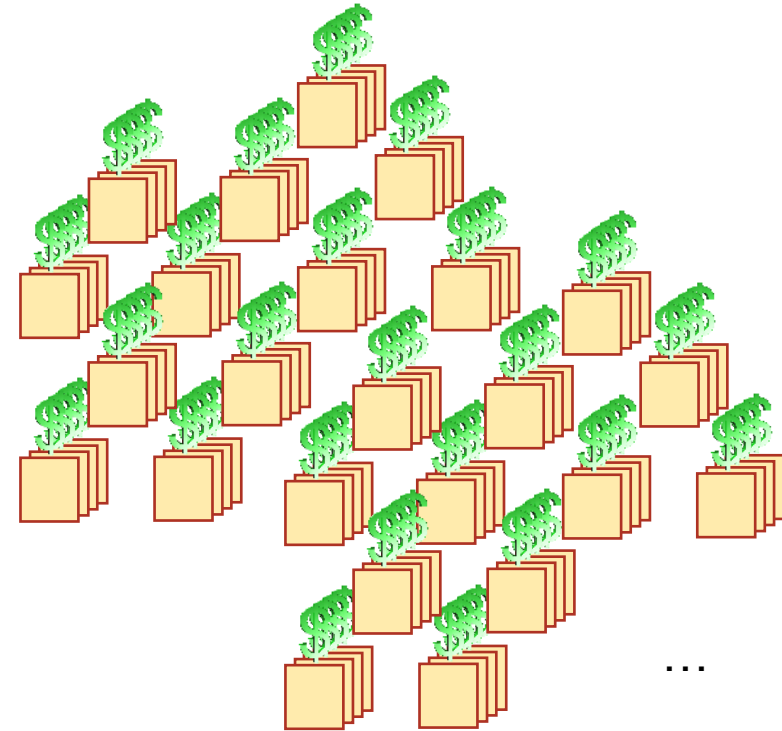


Scaling

- Selling Time

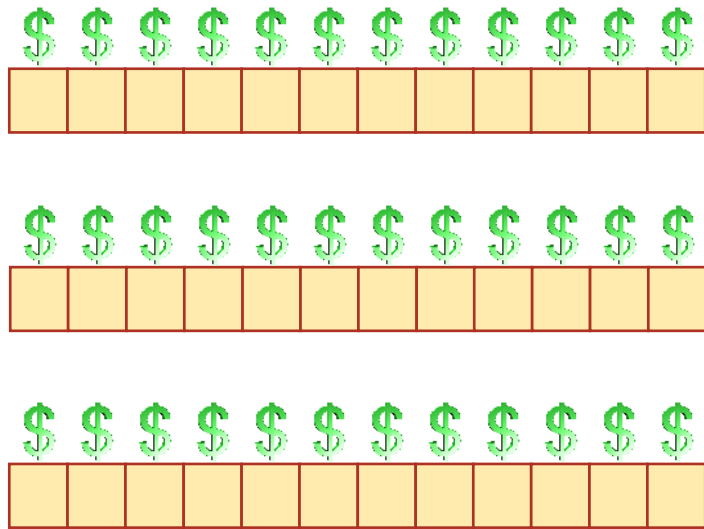


- Selling Things

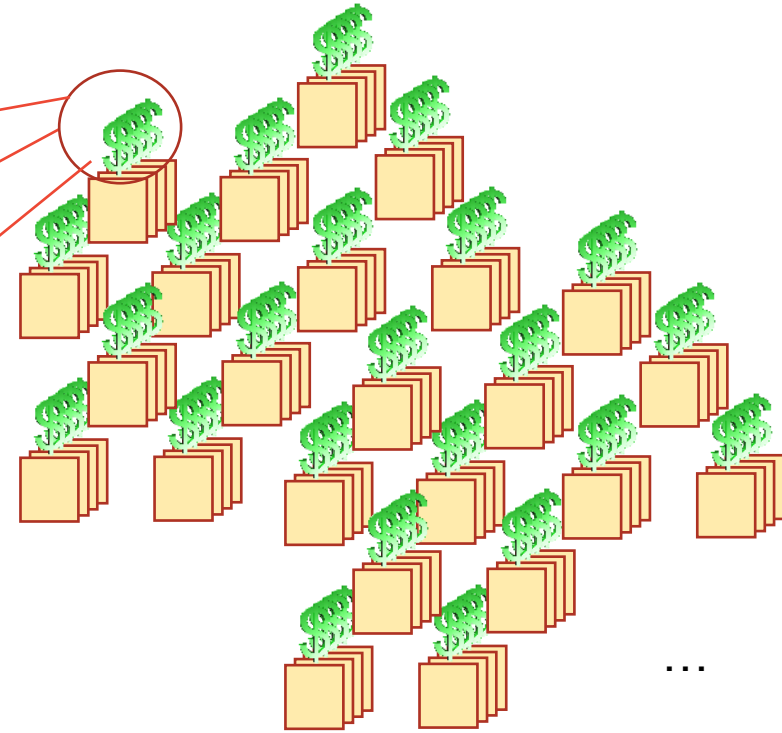


Scaling

- Selling Time



- Selling Things





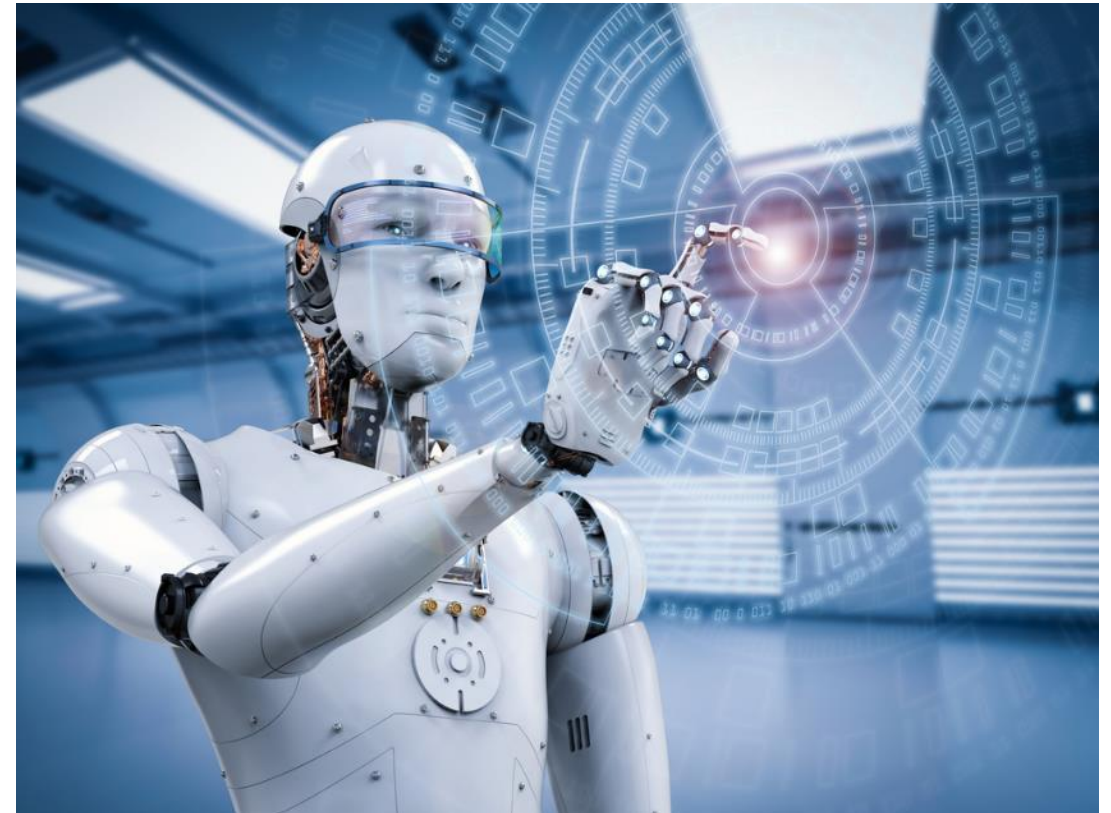
Understanding AI

AI Breakthrough Span 2 Categories

- Computer Vision



- Natural Language Processing

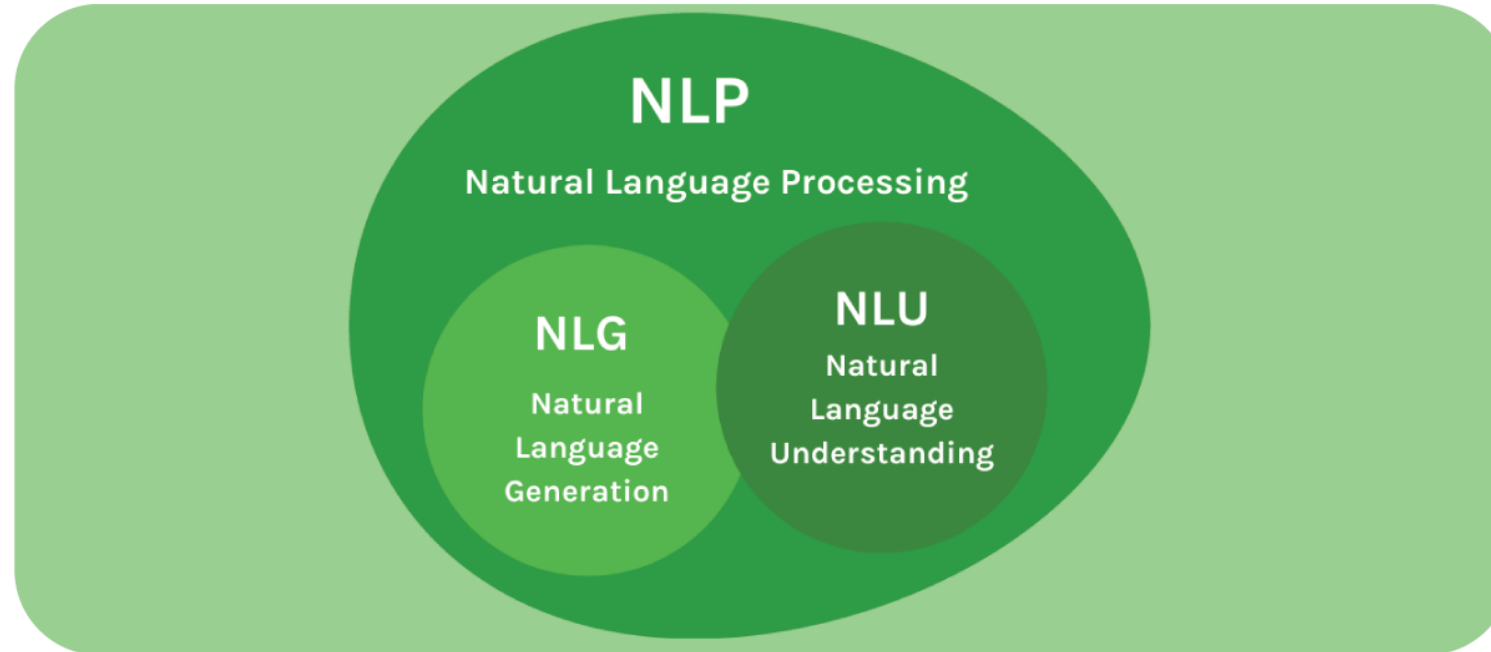


What is NLP?

- **Wiki: Natural language processing (NLP)** is a field of computer science, artificial intelligence, and computational linguistics concerned with the interactions between computers and human (**natural**) languages.



What is NLP?



What is NLP?

- “Natural” languages
 - English, Mandarin, French, Swahili, Arabic, Nahuatl,
 - NOT Java, C++, Perl, ...
- Ultimate goal: Natural human-to-computer communication
- Sub-field of Artificial Intelligence, but very interdisciplinary
 - Computer science, human-computer interaction (HCI), linguistics, cognitive psychology, speech signal processing (EE), ...
- MANY APPLICATIONS IN THE WORLD AROUND US



Application: Machine Translation

Google

buenas noches

All

Images

Shopping

Apps

About 20,800,000 results (0.54 seconds)

Spanish

English

buenas noches

Goodnight

3 more translations

Open in Google Translate

Haaretz

הארץ

היום: נתניהו שוב ינסה להעביר את ד"ח טרכטנברג בממשלה
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Like · Comment · Translate · Share · Yesterday at 06:00

9 people like this.

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שוקי זקס

With full pay the price for hzhiloth vakombinot of the Prime Minister. Not find it appropriate to action lhabrat the health system. Endangered animals, people and caused the suffering that must drive with ... city. Foundation of Minneapolis had already thrown him. Europe also. This man destroys the country with the citizens in its path. Contempt you Binyamin Netanyahu. Netanyahu was not committed to voting the Trachtenberg managed to impose a "partnership hkoalicioniot terror the Prime Minister, who is pledging to bring voting day the conclusions report Trachtenberg. hourly opposes. Israel Beiteinu-independence morning ministerial session will vihalito only it-political system, news

Expand preview

Yesterday at 06:31 · Like · 2 people · Original

עמי וקנין

Or acknowledging the report moves or the chips will go

Yesterday at 07:10 · Like · Original

Dalya Gumis

Stop vote once to

Yesterday at 08:11 · Like · Original

Yuval Gilor

Tired already go home

Yesterday at 08:49 · Like · Original

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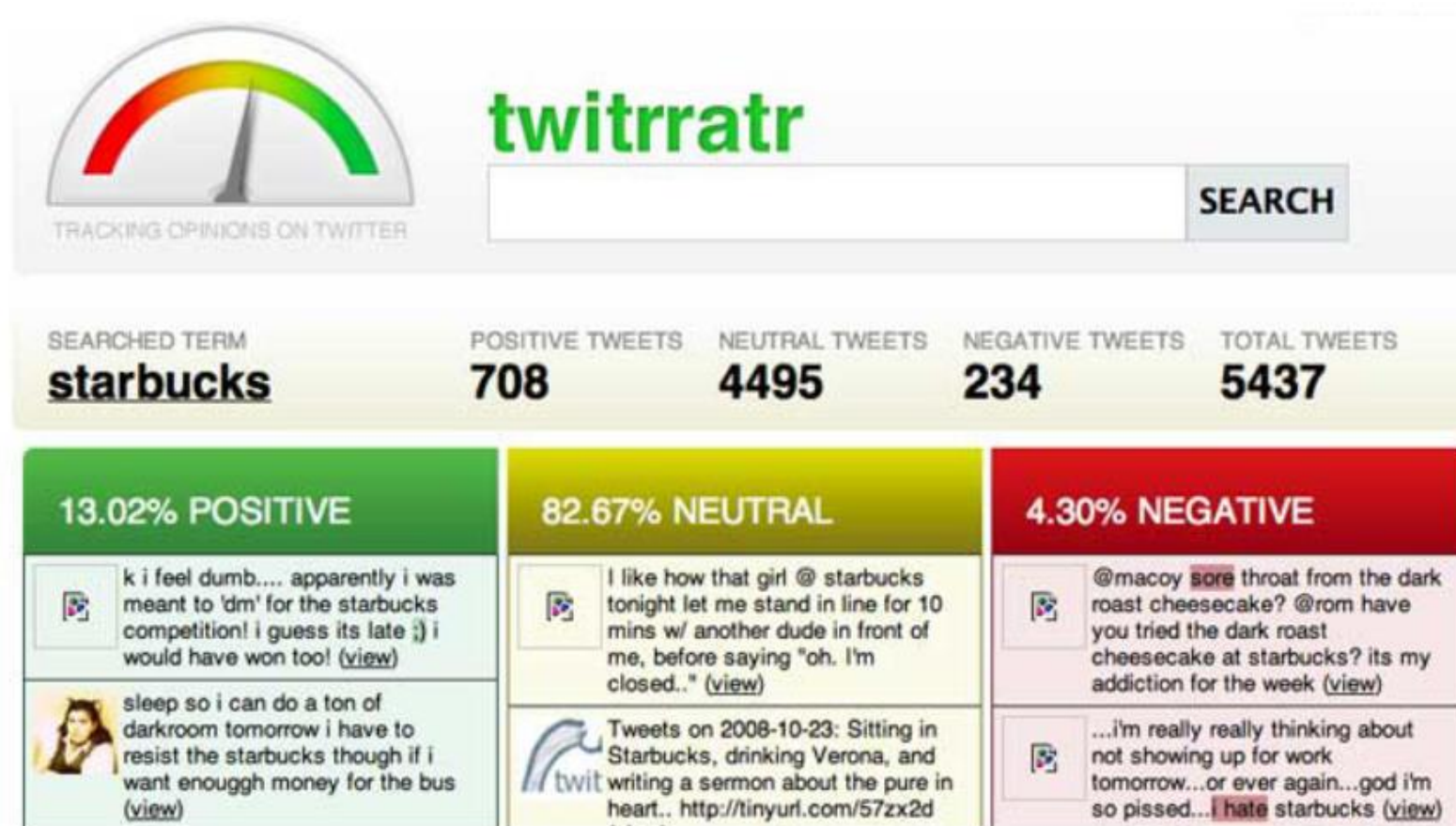
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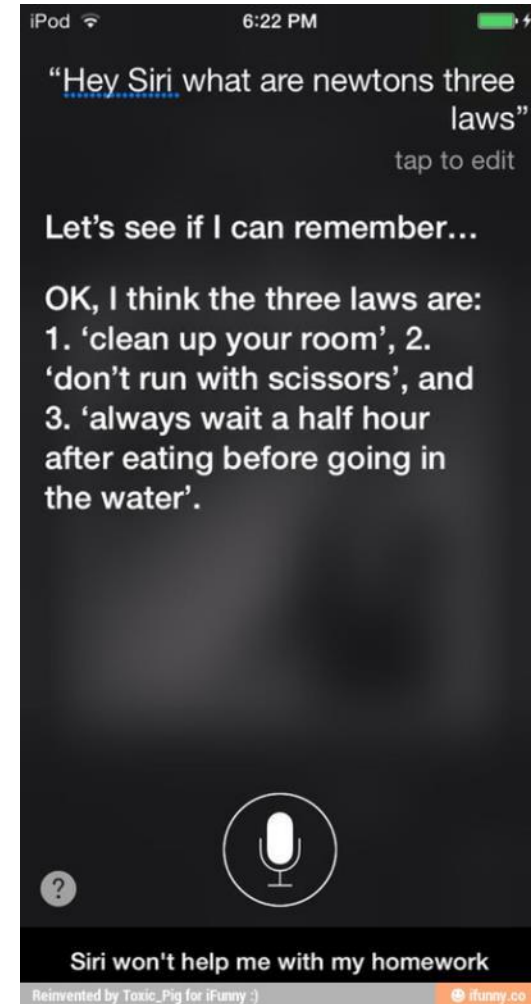
Application: Sentiment Analysis



Application: Text Classification



Application: Question Answering



credit: ifunny.com



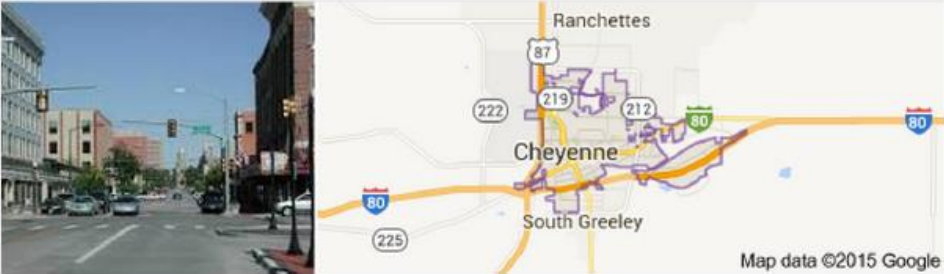
It's Everywhere

What's the capital of Wyoming?

Web Maps Shopping Images News More Search tools

About 984,000 results (0.54 seconds)

Wyoming / Capital



Cheyenne

Will it rain tomorrow?

Set an alarm for eight a.m.

Play music by Bruno Mars

How many teaspoons are in a tablespoon?

Add gelato to my shopping list

Wikipedia: Abraham Lincoln

When is Thanksgiving?

Play my "dinner party" playlist

What's the weather in Los Angeles this weekend?

Add "make hotel reservations" to my to-do list



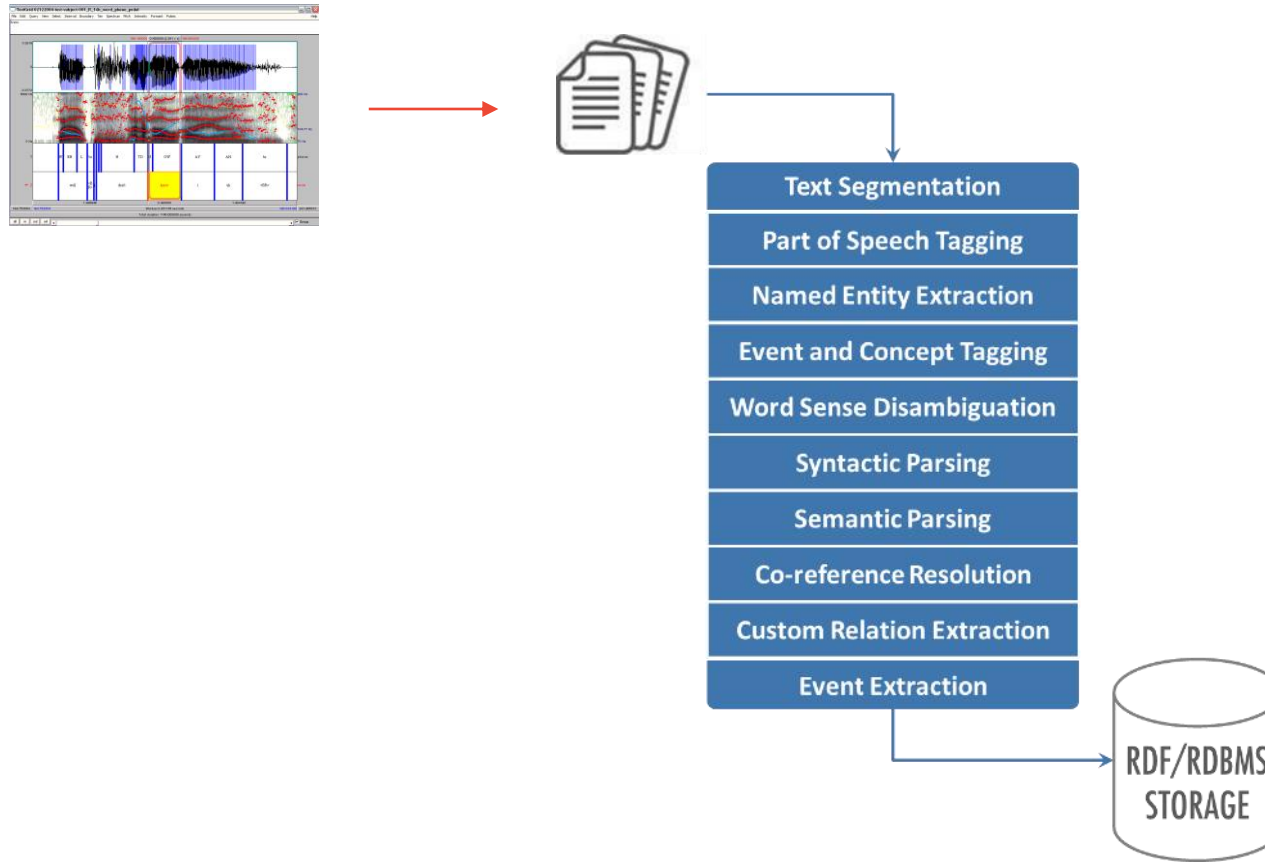
Application: Information Extraction

New York Times Co. named Russell T. Lewis, 45, president and general manager of its flagship New York Times newspaper, responsible for all business-side activities. He was executive vice president and deputy general manager. He succeeds Lance R. Primis, who in September was named president and chief operating officer of the parent.

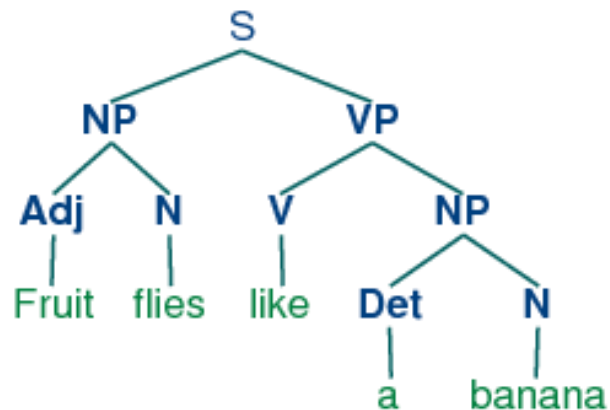
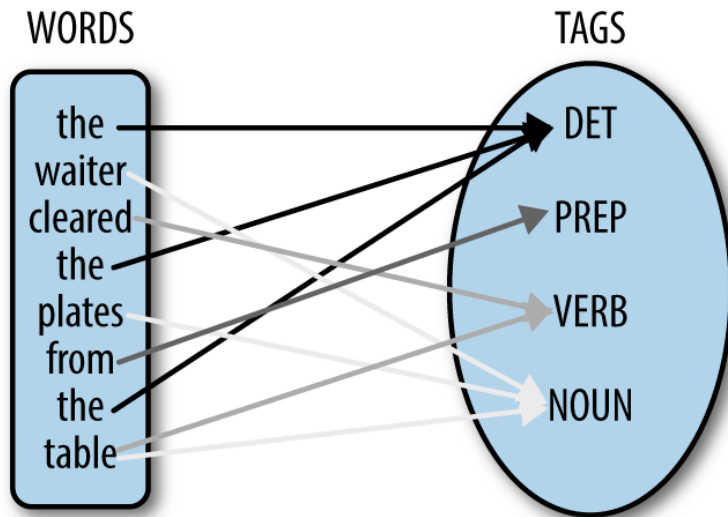
Person	Company	Post	State
Russell T. Lewis	New York Times newspaper	president and general manager	start
Russell T. Lewis	New York Times newspaper	executive vice president	end
Lance R. Primis	New York Times Co.	president and CEO	start



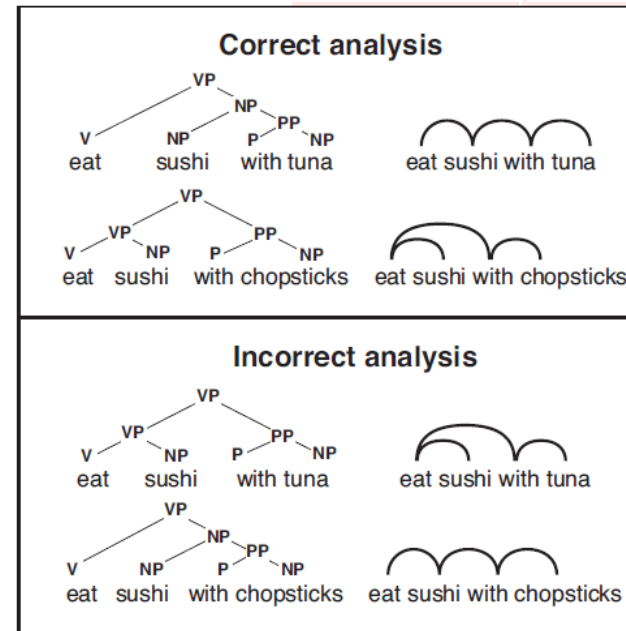
Classic NLP Pipeline



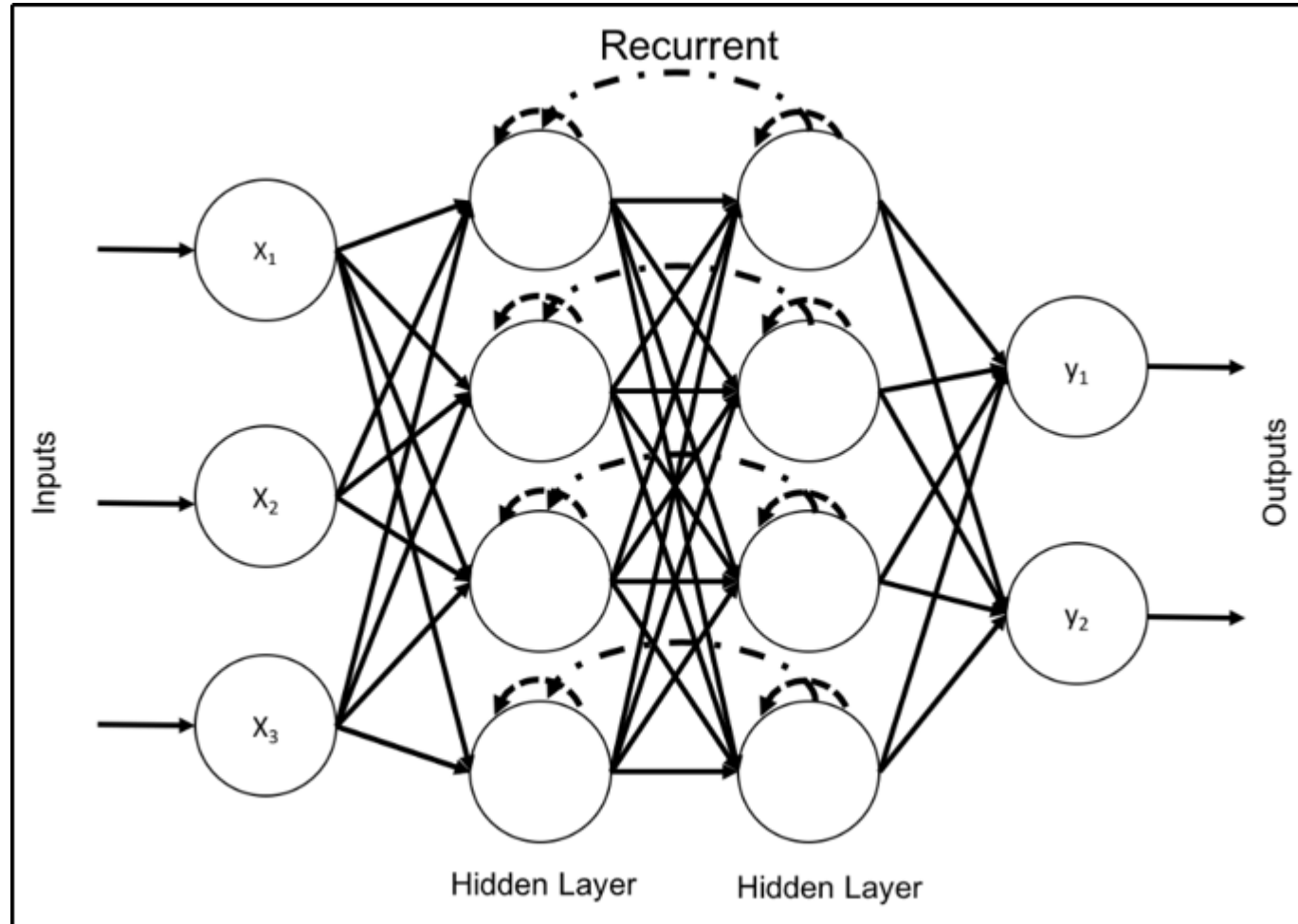
Old School NLP (pre 2010)



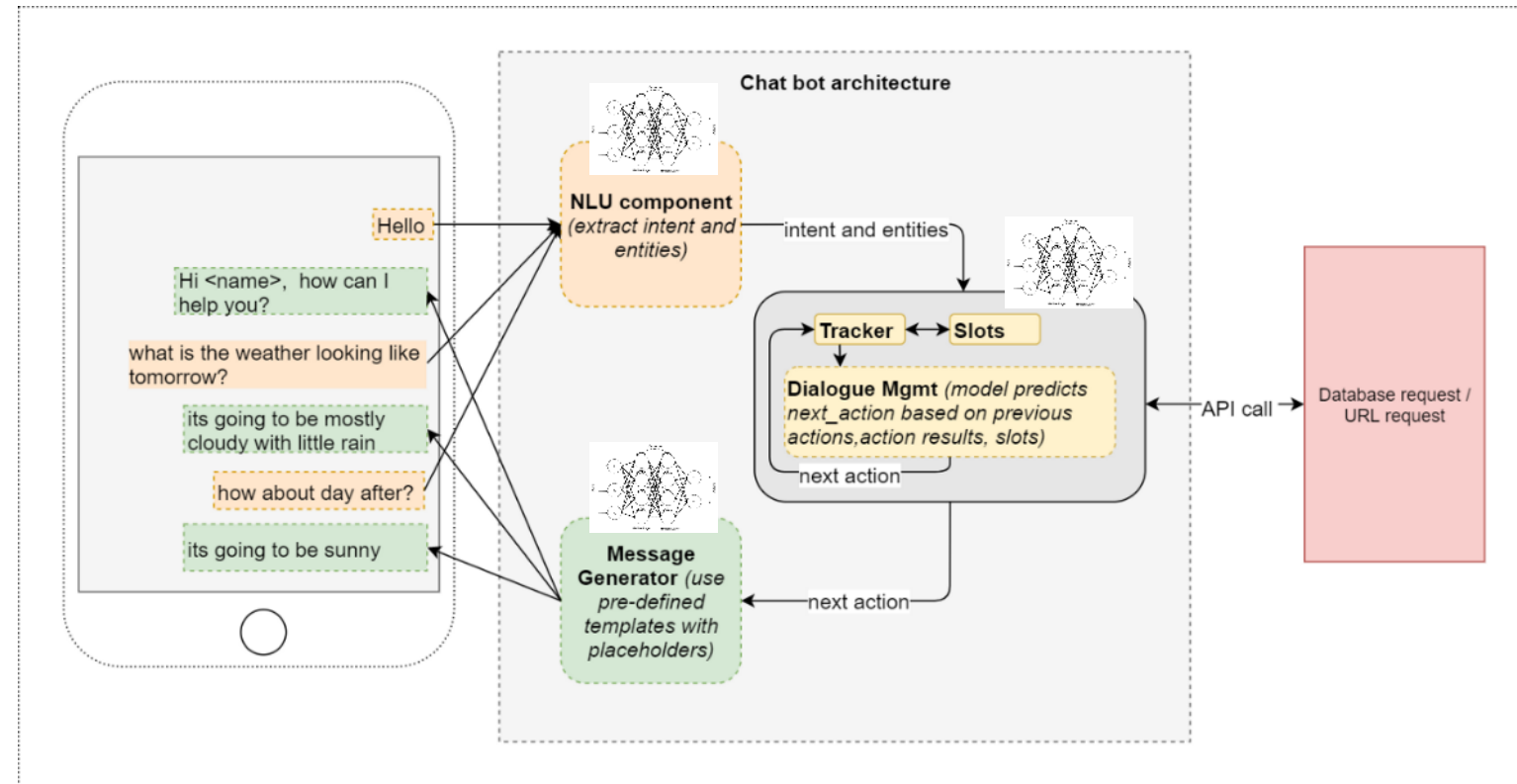
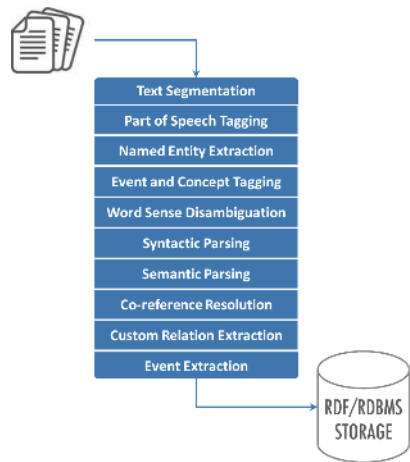
Tag	Meaning	English Examples
ADJ	adjective	new, good, high, special, big, local
ADP	adposition	on, of, at, with, by, into, under
ADV	adverb	really, already, still, early, now
CONJ	conjunction	and, or, but, if, while, although
DET	determiner, article	the, a, some, most, every, no, which
NOUN	noun	year, home, costs, time, Africa
NUM	numeral	twenty-four, fourth, 1991, 14:24
PRT	particle	at, on, out, over per, that, up, with
		he, their, her, its, my, I, us
		is, say, told, given, playing, would
	n marks	. , ; !
		ersatz, esprit, dunno, gr8, univeristy



Into the Future: Deep Learning, No Rules!

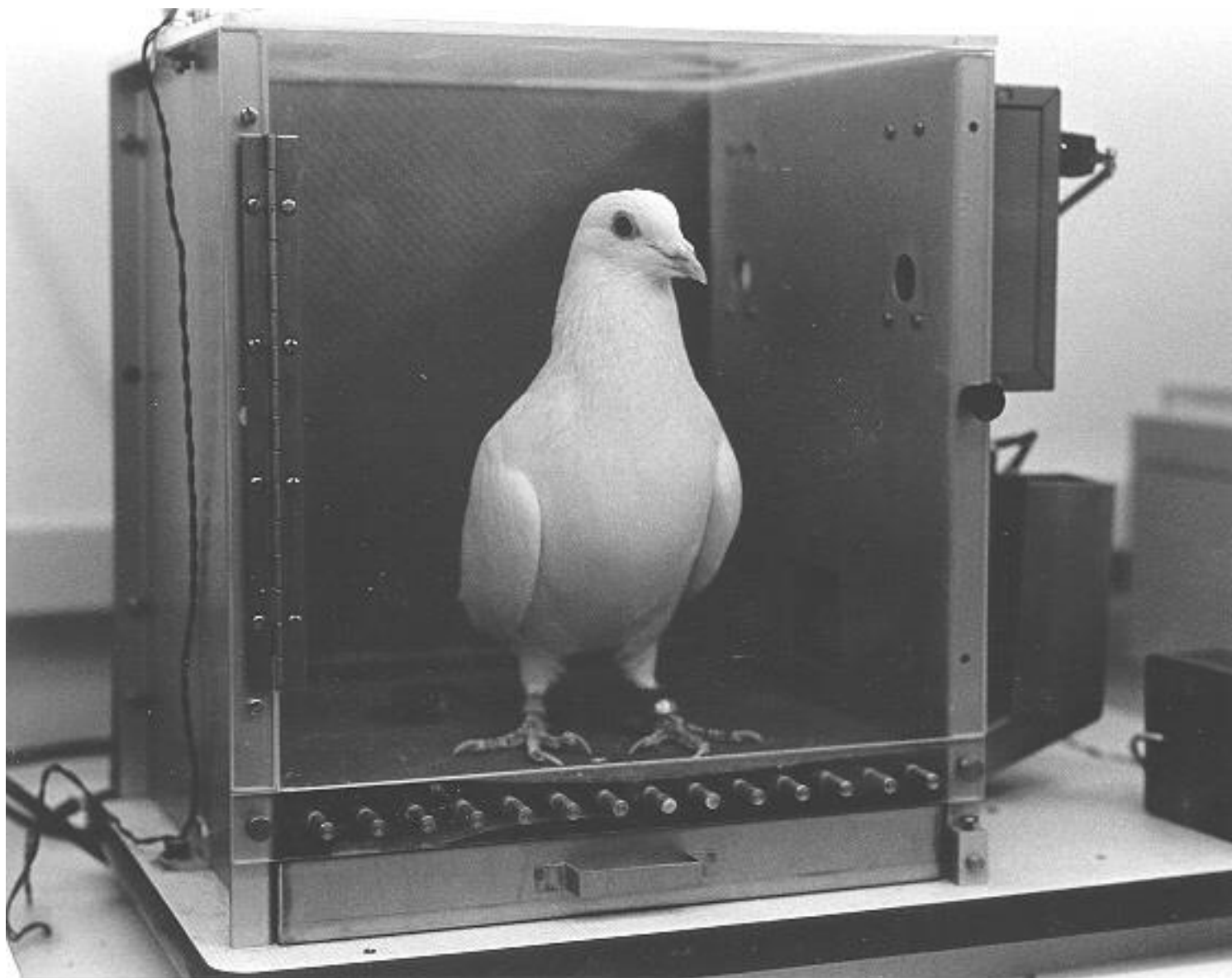


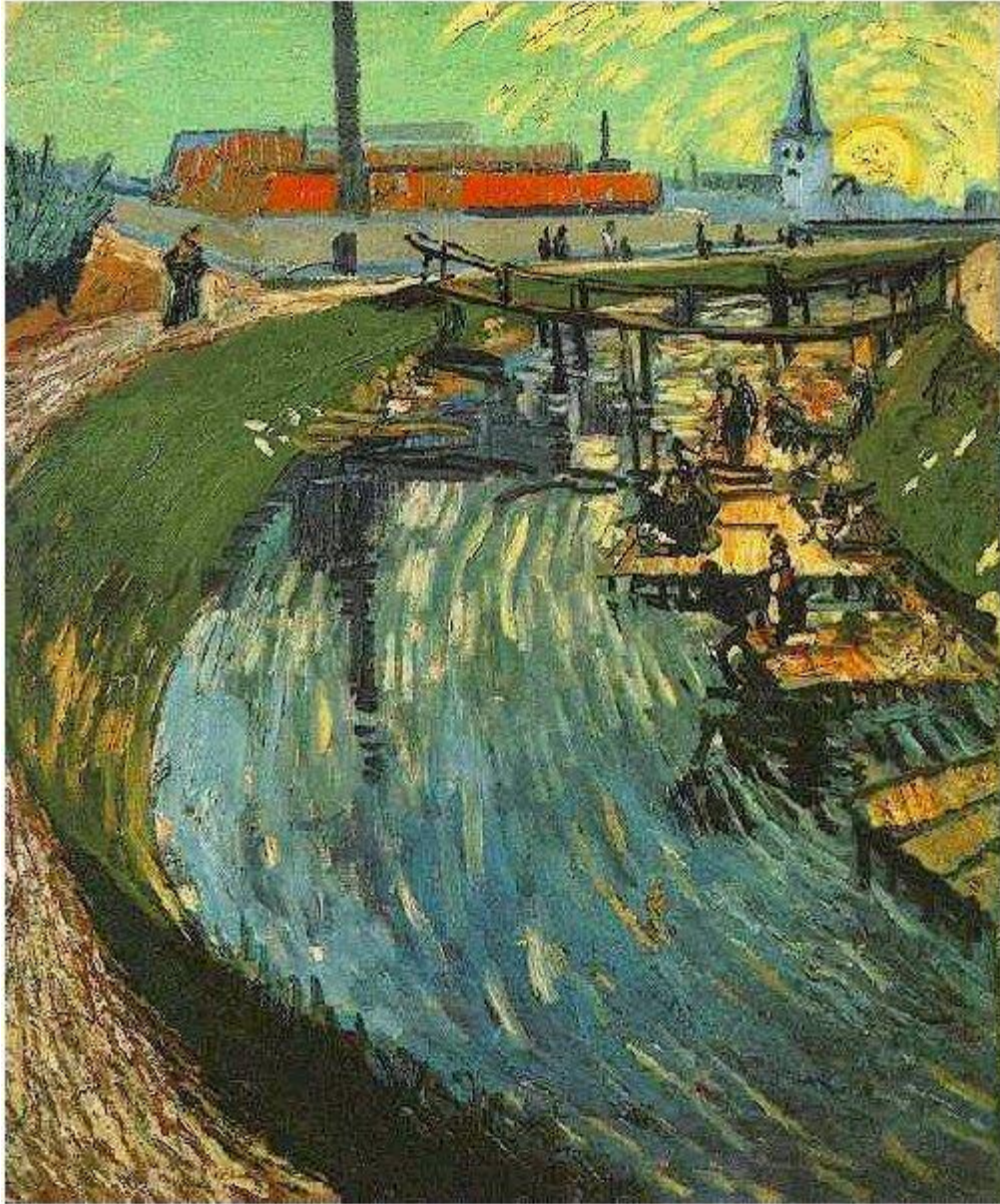
Modern Conversational AI

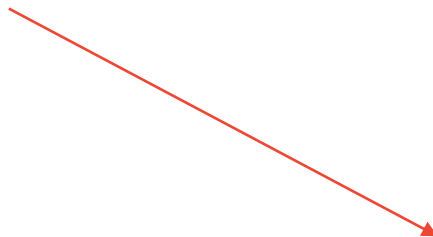
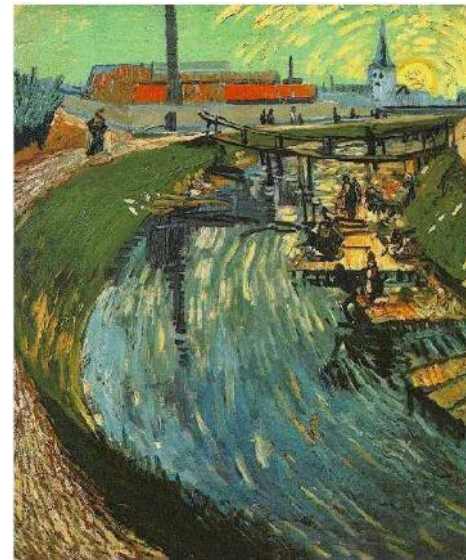
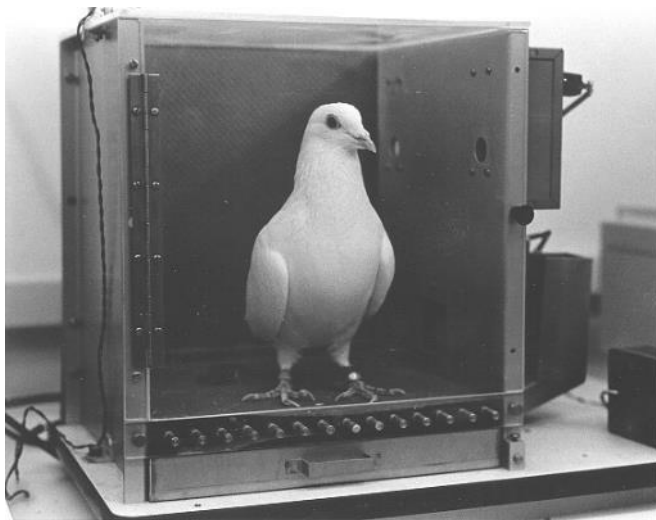




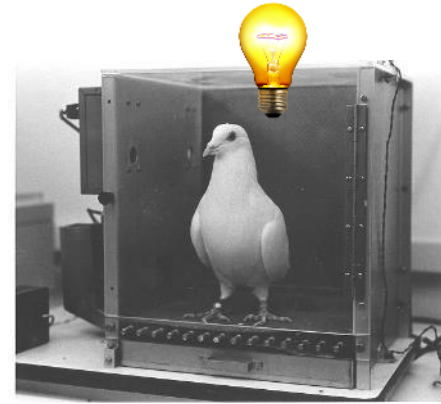
Key AI Insight





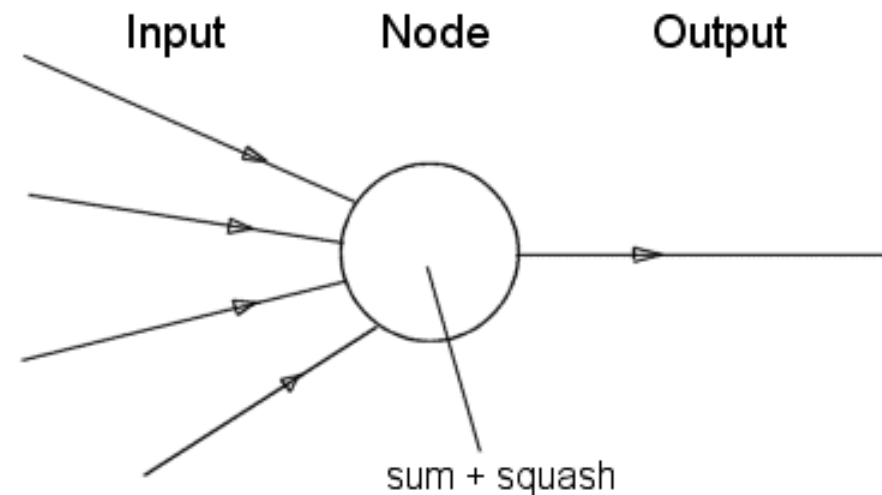
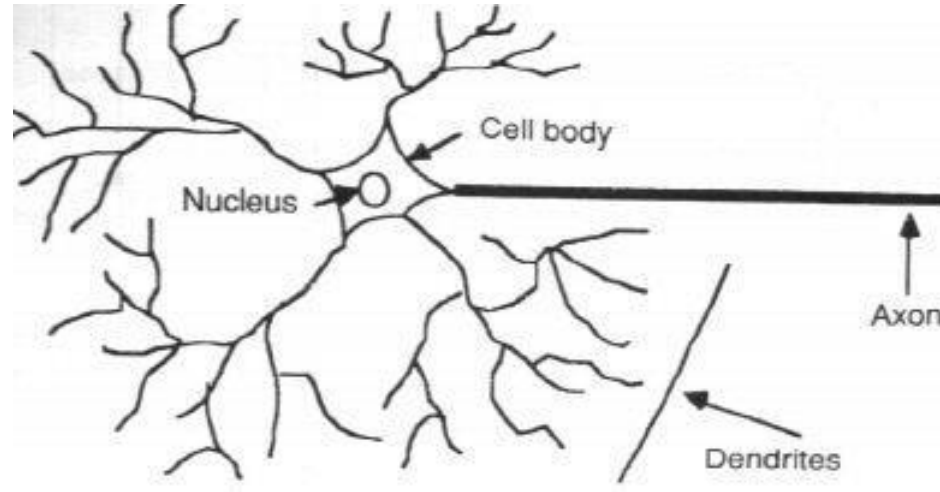


Pigeon Brains are Strong!



- Pigeons were able to discriminate between Van Gogh and Chagall with 95% accuracy (when presented with pictures they had been trained on)
- Discrimination still 85% successful for previously unseen paintings of the artists
- Pigeons do not simply memorise the pictures
- They can extract and recognise patterns (the 'style')
- They generalise from the already seen to make predictions
- This is what neural networks (biological and artificial) are good at (unlike conventional computer)

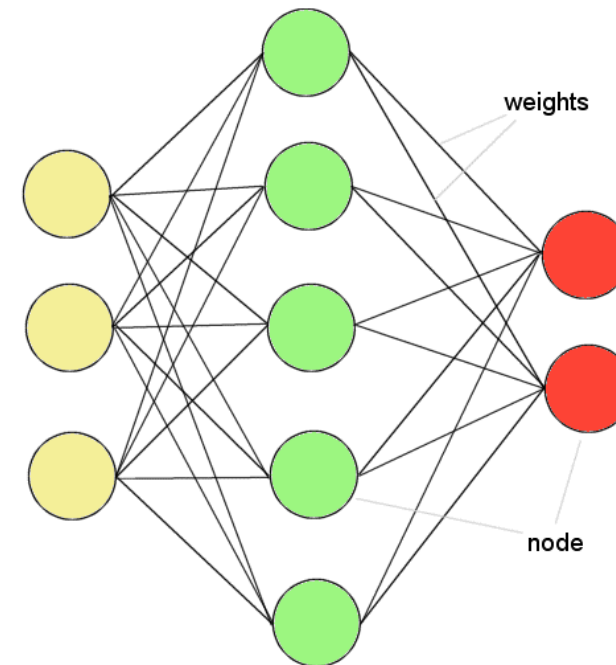
Can We Model Brains in Computers? Yes!



In with the ANN

- **Artificial Neural Networks** incorporate the two fundamental components of biological neural nets:

1. Neurones (nodes)
2. Synapses (weights)





Coding and Graphs

Where We Left Off

- The Basics
 - Variables
 - Types
 - Loops
 - If statements
 - etc

```
walker init {
    fav_nums=[];

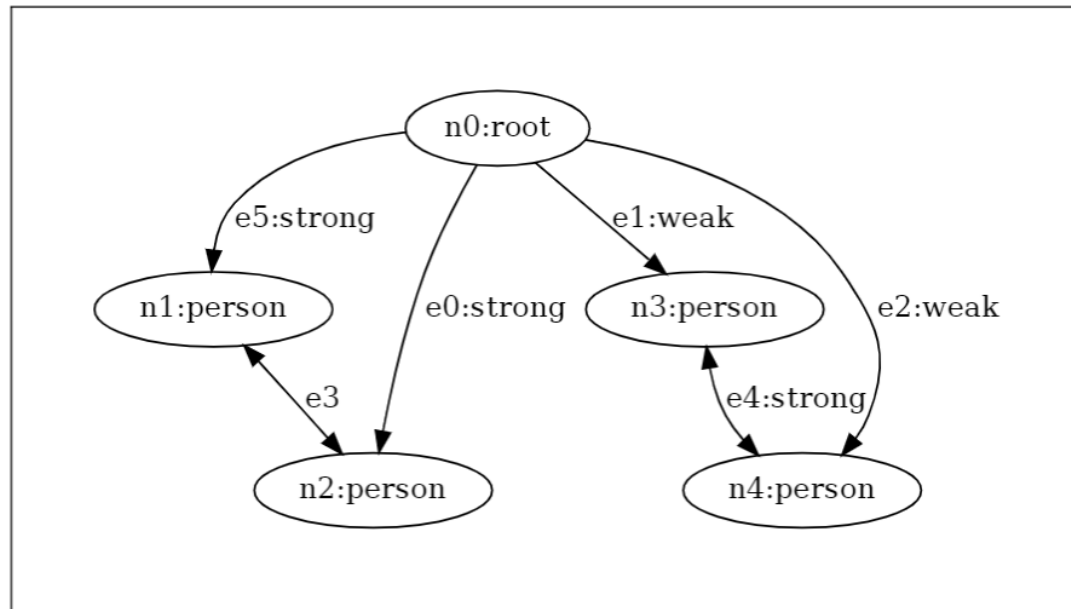
    for i=0 to i<10 by i+=1:
        fav_nums.1::append(i*2);
    std.out(fav_nums);

    fancy_str = "";
    for i in fav_nums {
        fancy_str = fancy_str + "two * " + i.str +
            " = " + (i*2).str + ", ";
    }
    std.out(fancy_str);

    count_down = fav_nums[-1];
    while (count_down > 0) {
        count_down -= 1;
        if (count_down == 14):
            continue;
        std.out("I'm at countdown "+count_down.str);
        if (count_down == 10):
            break;
    }
}
```



In Comes Graphs



- Spawn keyword used to spawn nodes and edges
- Can be assigned to variables, nodes are returned by default

```
node person {
    has name="Anon";
}

edge strong;
edge weak;

walker init {
    person1 = spawn here -[strong]->
node::person(name="Joe");
    person2 = spawn here -[strong]-> node::person;
    person3 = spawn here -[weak]-> node::person;
    person4 = spawn here -[weak]-> node::person(name="Mike");

    person1 <--> person2;
    person3 <-[strong]-> person4;

    for i in -->:
        std.out(i.context);
}
```



Navigating Graphs

```
node state {
    has response="I'm silly state ";
}

node hop_state;

edge hop;

walker hop_buildout {
    spawn here --> node::state;
    spawn here --> node::state;
    spawn here --> node::state;
}

walker hop_counter {
    has anchor num=0; take --> hop_state { num+=1; }
}
```

```
walker init {
    has state_visits=0, save_root;

    root {
        save_root = here;
        hop1 = spawn here -[hop]-> node::hop_state;
        hop2 = spawn here -[hop]-> node::hop_state;
    }

    hop_state:
        spawn here walker::hop_buildout;

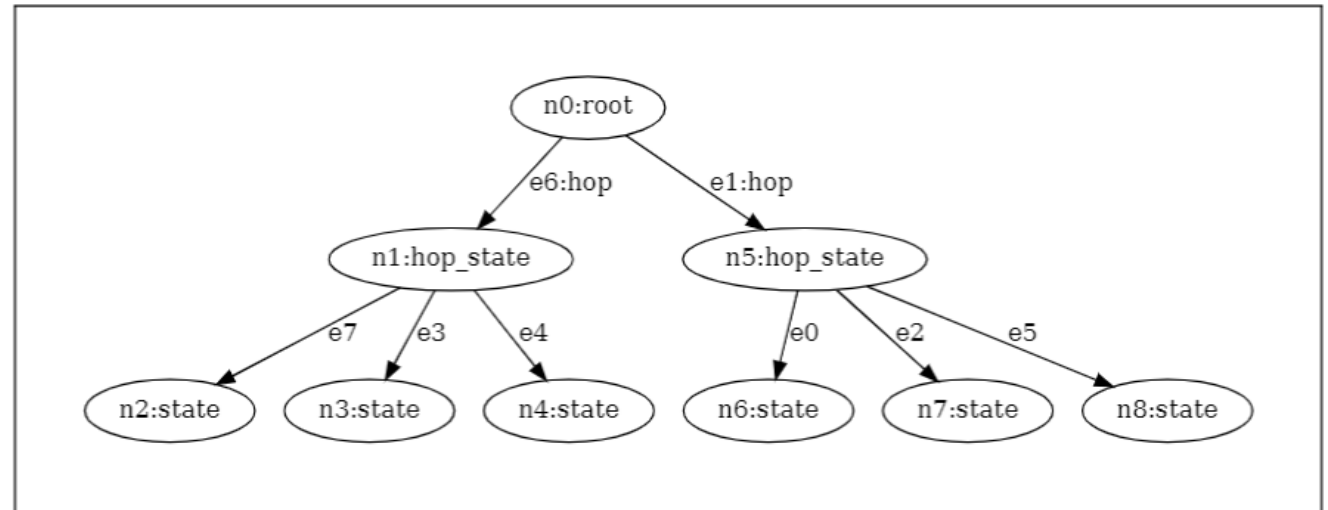
    state {
        state_visits += 1;
        std.out(here.response+state_visits.str);
    }

    take -->
    with exit {
        report spawn save_root walker::hop_counter;
    }
}
```



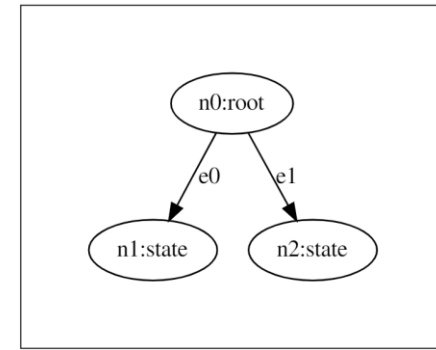
Navigating Graphs

- Take command
 - Queue up connected node for walker to go to next
 - Walker then executes full body on new node
 - Has variables are kept for journey
 - Node blocks will only execute on given node type



Compute In Node

- Nodes can execute code when walkers arrive (or invoked)
- Visitor, like here, always points to the walkers context (scope)
- Execution can be triggered as walkers enter or exit nodes



```
node state {
  has name = rand.word().str::upper;
  has response = "I'm a silly bot. ";
  has user_utter;

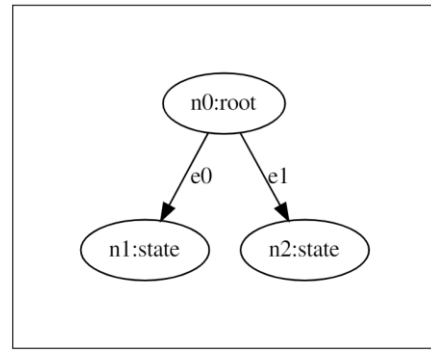
  can speak with entry {
    std.out("I'm "+name+". And I currently have " +
    visitor.info['name'] +
    " on me! ");
  }

  can listen with talker exit {
    user_utter = visitor.utterance;
    std.out("I heard '"+user_utter+"'\\n");
    std.out(response);
  }

  can test_path with hop_counter entry {
    visitor.path.l::append(&here);
  }
}
```

Compute In Node

- Walkers can be very simple
- Behavior specified in the nodes themselves



```
walker init {
  root {
    n1 = spawn here --> node::state;
    n2 = spawn here --> node::state;
  }
  spawn here walker::talker;
  spawn here walker::hop_counter;
}

walker talker {
  has utterance, path = [];
  utterance = rand.sentence();
  take -->;
}

walker hop_counter {
  has anchor path = [];
  take -->;

  with exit { std.out("\nHopper's path:", path); }
}
```

Static Graphs

- Static graphs are ‘graph generators’
- Must specify an anchor node
- Handy for creating large graphs quickly
- Useful for tests!

```
node person {
  has name="Anon";
}

edge strong;
edge weak;

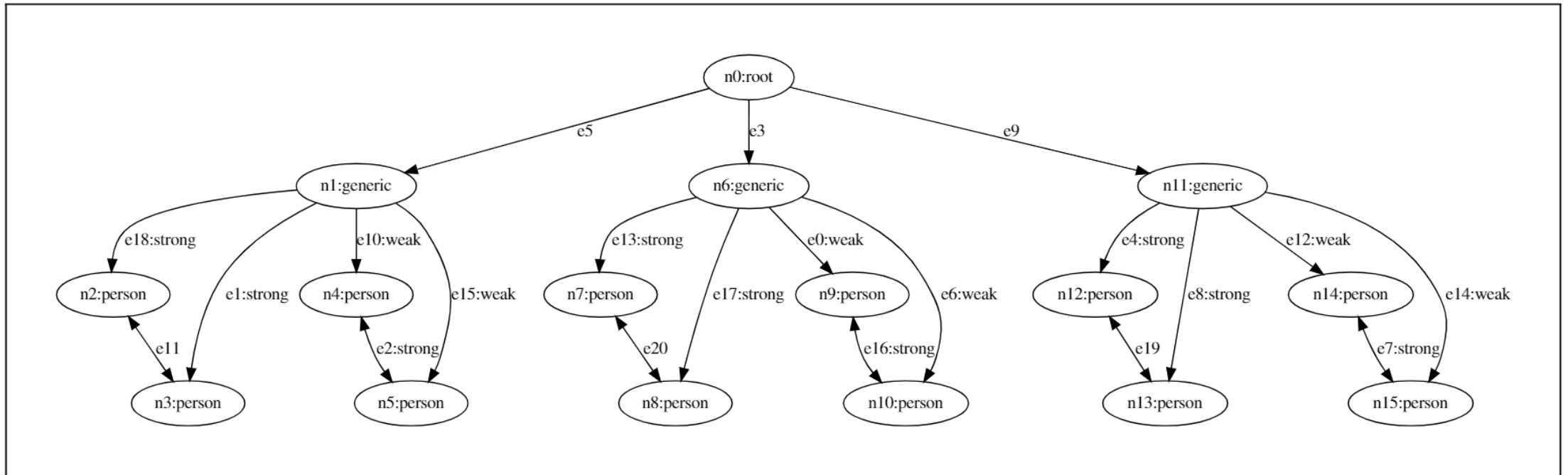
graph basic_gph {
  has anchor root;
  spawn {
    root = spawn node::generic;
    person1 = spawn root -[strong]-> node::person(name="Joe");
    person2 = spawn root -[strong]-> node::person;
    person3 = spawn root -[weak]-> node::person;
    person4 = spawn root -[weak]-> node::person(name="Mike");

    person1 <--> person2;
    person3 <-[strong]-> person4;
  }
}

walker init {
  spawn here --> graph::basic_gph;
  spawn here --> graph::basic_gph;
  spawn here --> graph::basic_gph;
}
```



Static Graphs



Tests

```
node person: has name="Anon";

graph basic {
  has anchor root;
  spawn {
    root = spawn node::generic;
    person1 = spawn root --> node::person(name="Joe");
    person2 = spawn root --> node::person;
    person3 = spawn root --> node::person;
    person4 = spawn root --> node::person(name="Mike");
    person1 <--> person2;
    person3 <--> person4;
  }
}

walker tally {
  has count=0, visited=[];
  count += 1;

  if(here not in visited) {
    visited.l::append(here);
    take -->;
  }
}
```

```
test "Size of basic graph"
with graph::basic by walker::tally {
  assert(visited.length == 5);
  assert(count > 5);
}

test "Size of a bit fancier graph"
with graph {
  has anchor root;
  spawn {
    root = spawn node::generic;
    spawn root --> graph::basic; spawn root -->
graph::basic;
  }
} by walker::tally {
  assert(visited.length == 11);
  assert(count > 11);
}
```



Tests

- Tests are very powerful for developing code
- Can specify a graph for a walk to walk on and assert values make sense

```
ninja@DESKTOP-V09IVBR:~/jac_convAI/tinker$ jsctl -m jac test tldr_test.jac
Testing "Size of basic graph": [PASSED in 0.00s]
Testing "Size of a bit fancier graph": [PASSED in 0.01s]
{
  "tests": 2,
  "passed": 2,
  "failed": 0,
  "success": true
}
ninja@DESKTOP-V09IVBR:~/jac_convAI/tinker$
```

```
test "Size of basic graph"
with graph::basic by walker::tally {
  assert(visited.length == 5);
  assert(count > 5);
}

test "Size of a bit fancier graph"
with graph {
  has anchor root;
  spawn {
    root = spawn node::generic;
    spawn root --> graph::basic; spawn root -->
graph::basic;
  }
} by walker::tally {
  assert(visited.length == 11);
  assert(count > 11);
}
```

