What kind of thing is a mind?
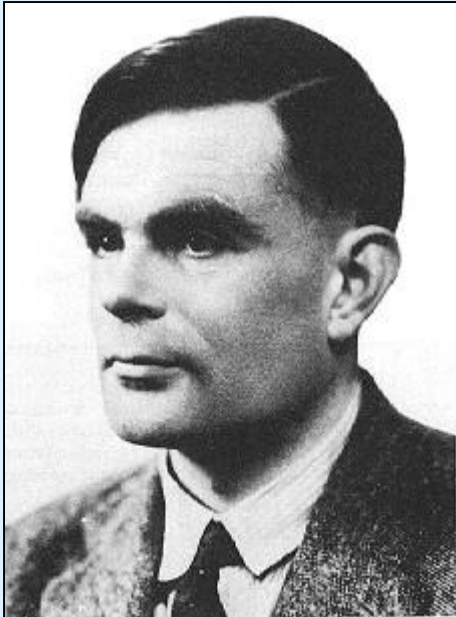
Structural Kinds

- What is it made of?
- Medium dependent

Functional Kinds

- What does it do?
- Medium independent

Alan Turing: The Turing Test

The Judge (you)

Hello. I'm Eliza. Please talk to me.
> winter in chicago depresses me
WHAT IS IT ABOUT WINTER IN CHICAGO THAT DEPRESSES YOU
> because it there is so much snow
THAT IS A GOOD REASON
> there is way too much snow
HOW CAN YOU REDUCE THE SNOW
> i could move to florida
YOU COULD MOVE TO FLORIDA
> but then it would be too hot in the summer
THERE ARE ALWAYS PLUSSES AND MINUSES
> so there are
TELL ME MORE
> i am tired of talking to you
YOU ARE TIRED OF TALKING TO I
> that should be me
TELL ME MORE
> you are a stupid program
TELL ME MORE
> :ex

```
JUDGE02[12:31:45]Hello.                                              A
_____[12:32:17]Do you have a cat?

JUDGE02[12:32:43]Yes, I have two cats, Allegro and Tipsy.
_____[12:33:01]I'm very fond of cats. My Felix is about 3 years old
_____[12:33:05]and has all the energy of a kitten.

JUDGE02[12:33:42]That sounds like my cat Tipsy. Do you have a dog?
_____[12:33:59]Do you come from around here? No, but I have a cat.

JUDGE02[12:34:22]No, I'm from the U.S.A.
_____[12:34:34]Would you like to have a drink with me later?

JUDGE02[12:34:47]If you're human, maybe.
_____[12:34:57]I thought you were human.

JUDGE02[12:35:17]I am! Where are you from?
_____[12:35:29]What? I'm from Rockmart, Georgia.

JUDGE02[12:36:08]Really! I'm from South Walpole, MA. How long have you been here?
_____[12:36:23]Do you like Mexican food?

JUDGE02[12:36:35]I love Mexican food, but I like Indian better.
_____[12:36:53]So, love mexican food but you like indian better. Tell me more.
_____[12:37:07]I'm not wearing my watch, so I don't know exactly.

JUDGE02[12:37:24]Do you want to know the time?
_____[12:37:29]Yes you do.
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JUDGE04[13:40:58]hello                                                        B
_____[13:41:21]hi how are u?

JUDGE04[13:41:31]I am fine what about you ?
_____[13:41:39]i am also fine.

JUDGE04[13:41:53]What would you like to talk about ?
_____[13:42: 0]i don't mind

JUDGE04[13:42:10]What about the mind ?
_____[13:42:21]what would u like to talk about?

JUDGE04[13:42:31]Impeachment ?
_____[13:42:50]so do you think Clinton should lose his job or not?

JUDGE04[13:43:24]I don't think he should but that is an European perspective
_____[13:44:18]I also don't think he should lose his job, what he did was
_____[13:44:25]wrong but it did not stop him form doing his job.

JUDGE04[13:44:38]I agree; Do watch the trial closely ?
_____[13:45:11]no, the americans can worry about that themselves

JUDGE04[13:45:32]I agree, so what is there to worry about in OZ ?
_____[13:46:16]well pauline hanson seems to have disapeared which
_____[13:46:23]is good, but the oz government still has somw nutcases

JUDGE04[13:46:56]I won't ask you for any names ; so what are you up to this week ?
_____[13:47:16]mainly relaxing, and going out with friends

JUDGE04[13:47:24]You must be a student then
_____[13:47:34]yes i am a student, what about u?
```

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JUDGE09[13:16:28]hi                                              A
_____[13:16:36]Who are you?

JUDGE09[13:16:46]charles
_____[13:16:56]Hi Charles, What do you do?

JUDGE09[13:17:13]not much. how about you.
_____[13:17:30]Not too much either. I'm a computer science student.

JUDGE09[13:17:45]What do you want to talk about?
_____[13:18: 1]I don't really mind. What do you want to talk about.

JUDGE09[13:18:20]Oh, I'm not too fussed either. Pretty well any topic
JUDGE09[13:18:33]interests me. I'm very easily pleased.
_____[13:18:47]So what is the flight velocity of an unladen swallow?

JUDGE09[13:19:17]I dont know, but I could find out.
_____[13:19:47]OK. You might want to watch monty python movies for the
_____[13:19:59]answer to this and many more intriguing questions

JUDGE09[13:20:13]like dead parrots?
_____[13:20:22]Yes.  So what did you do last weekend.

JUDGE09[13:23:16]took drugs
_____[13:23:23]What type of drugs?

JUDGE09[13:23:42]that would be telling.
_____[13:23:56]OK. What else did you do on the weekend.
```

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_____  [11:51:54] Well look who it iis... Judge 6! Welcome.

JUDGE06 [11:52:12] thankyou very much. I am so pleased to see you!
_____  [11:52:20] You can call me Chris. It's short for Christine.

JUDGE06 [11:52:40] Okay chris. My name is Leah.
_____  [11:52:48] Thank you, but I'll probably forget that.

JUDGE06 [11:53:11] That's okay. Most people either spell it wrong or forget
JUDGE06 [11:53:20] it anyway. How are you today?
_____  [11:53:27] i am, and i think you are too!

JUDGE06 [11:53:41] You  are what?
_____  [11:53:45] You tell me.

JUDGE06 [11:53:55] VEry nice.
_____  [11:53:58] Veryy nice?

JUDGE06 [11:54:05] yes.
_____  [11:54:18] Well, I'm coming to the conclusion that I'm talking to a
_____  [11:54:18] computer hhere. Am I right?

JUDGE06 [11:54:59] Not necessaroily. Any way tell me something about your self.
JUDGE06 [11:55:05] something most people wouldn't know.
_____  [11:55:05] Like a story?

JUDGE06 [11:55:20] My father wears odd socks. Do you wear odd socks?
_____  [11:55:55] Yes... sometimes.

JUDGE06 [11:56:00] why?
_____  [11:56:02] I wonder.
```

B

In- Class Demo

In 15 words or less, state a question that Would be very hard for a computer to give An 'intelligent' answer to.

Objections to the Turing Test

1) The judge might be an idiot.

2) All Possible Conversations Program (i.e. Aunt Bubbles)

Difficulty in producing all possible responses

Not only every statement and response
Need responses based on set of previous responses

J: What did you want to grow up to be when you were a child?
A: I wanted to be president of the US
J: Please explain why
A: Well, it's because …
J: That's a long answer – can you summarize?

Difficulty in producing all possible responses

Not only every statement and response
     Need responses based on set of
     previous responses

J: Who is your favorite president?
A: Abraham Lincoln.
J: Please explain why
A: Well, it's because …
J: That's a long answer – can you summarize?

Objections to the Turing Test

1) The judge might be an idiot.

2) All Possible Conversations Program
   (i.e. Aunt Bubbles)

3) The too-smart argument
   (What's the cube root of 160,103,007?)

Objections to the Turing Test

1) The judge might be an idiot.

2) All Possible Conversations Program (i.e. Aunt Bubbles)

3) The too-smart argument (What's the cube root of 160,103,007?)

4) Searle's Chinese Room Argument (Syntax vs. Semantics)

Responses to Searle

Systems Argument

1) **The entire room, including both the person and the rule-book, knows Chinese, even though the person doesn't.**
   -> He could memorize the rule-book, and internalize the entire system.

2) **If the room interacted with the world, it would know Chinese.**

Robot Argument

   -> Even if you put the room in a robot, with arms and legs and eyes, he would still only be manipulating symbols.

Responses to Searle

3) The rule book had to come from a person who did understand Chinese. In some sense you are conversing with THAT mind. You are speaking backwards through time (e.g. with the help of the rule-book) to THAT mind

Back-to-the-future Argument

4) Generating such a system is practically Impossible. The probability of a building such A system is very close to 0 because it would require too much input time

Probability Argument

Turing Test Summary

A way of determining if something else has a mind

An interesting idea but problematic
  judge problems
  all possible conversations
      Searle's chinese room
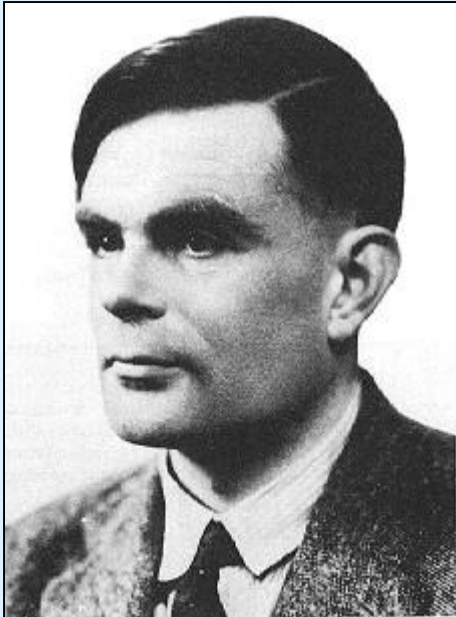   **(syntax vs. semantics)**
  other mind too smart

How can we model a mind's computations?

Goal: Develop a machine that can compute ANYTHING that it is logically possible to calculate

This machine would be a model for any possible mind

Alan Turing: The Turing Machine

Goal: Develop a machine that can compute ANYTHING that it is logically possible to calculate

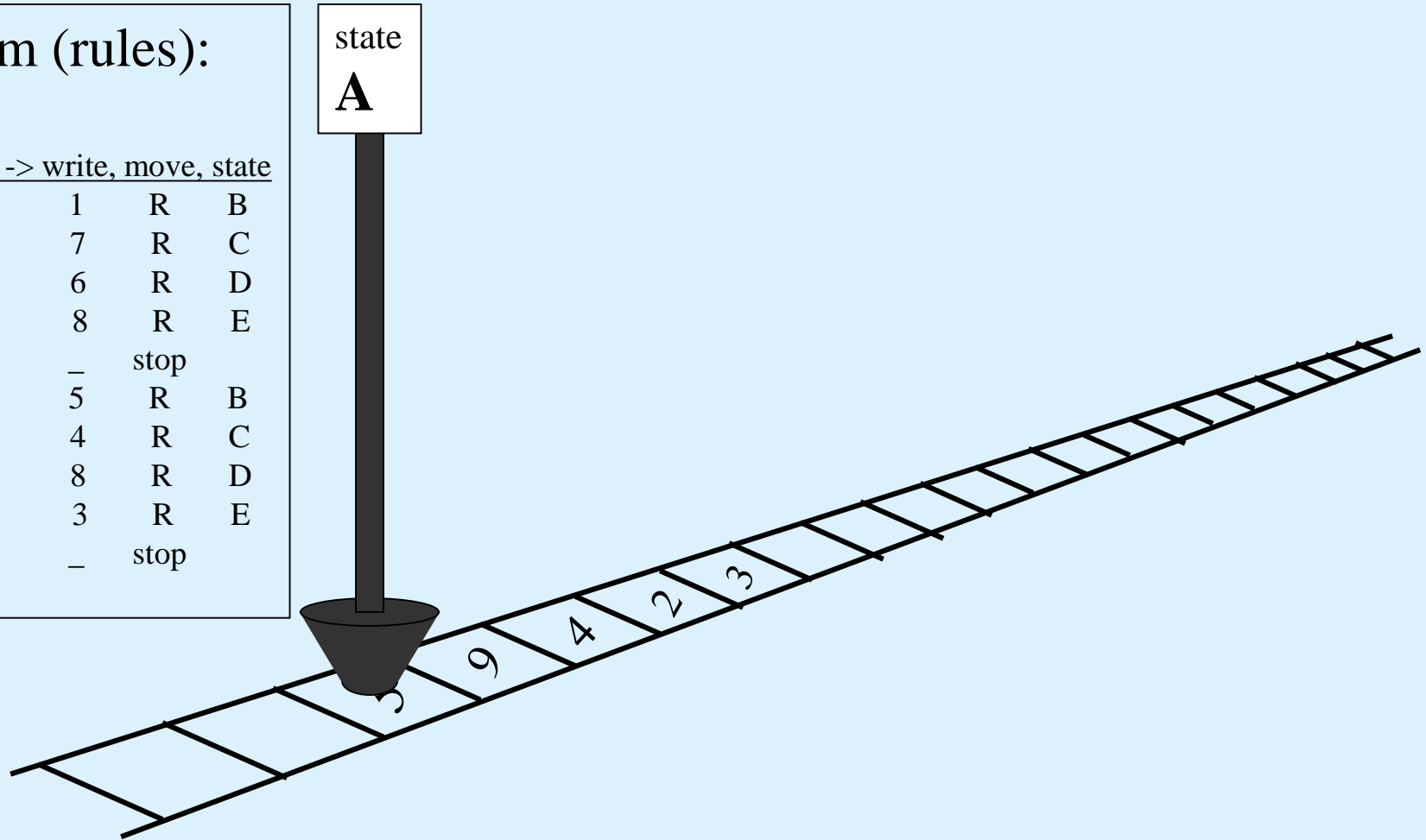**Served as foundation for modern computer**

Alan Turing: The Turing Machine

Program (rules):

state, input	-> write, move, state

state	input	write	move	state
A	5	1	R	B
B	9	7	R	C
C	4	6	R	D
D	2	8	R	E
E	3	_	stop	
A	1	5	R	B
B	7	4	R	C
C	6	8	R	D
D	2	3	R	E
E	9	_	stop	

(.......)

state

A

5 9 4 2 3

Alan Turing: The Turing Machine

state
E

Program (rules):

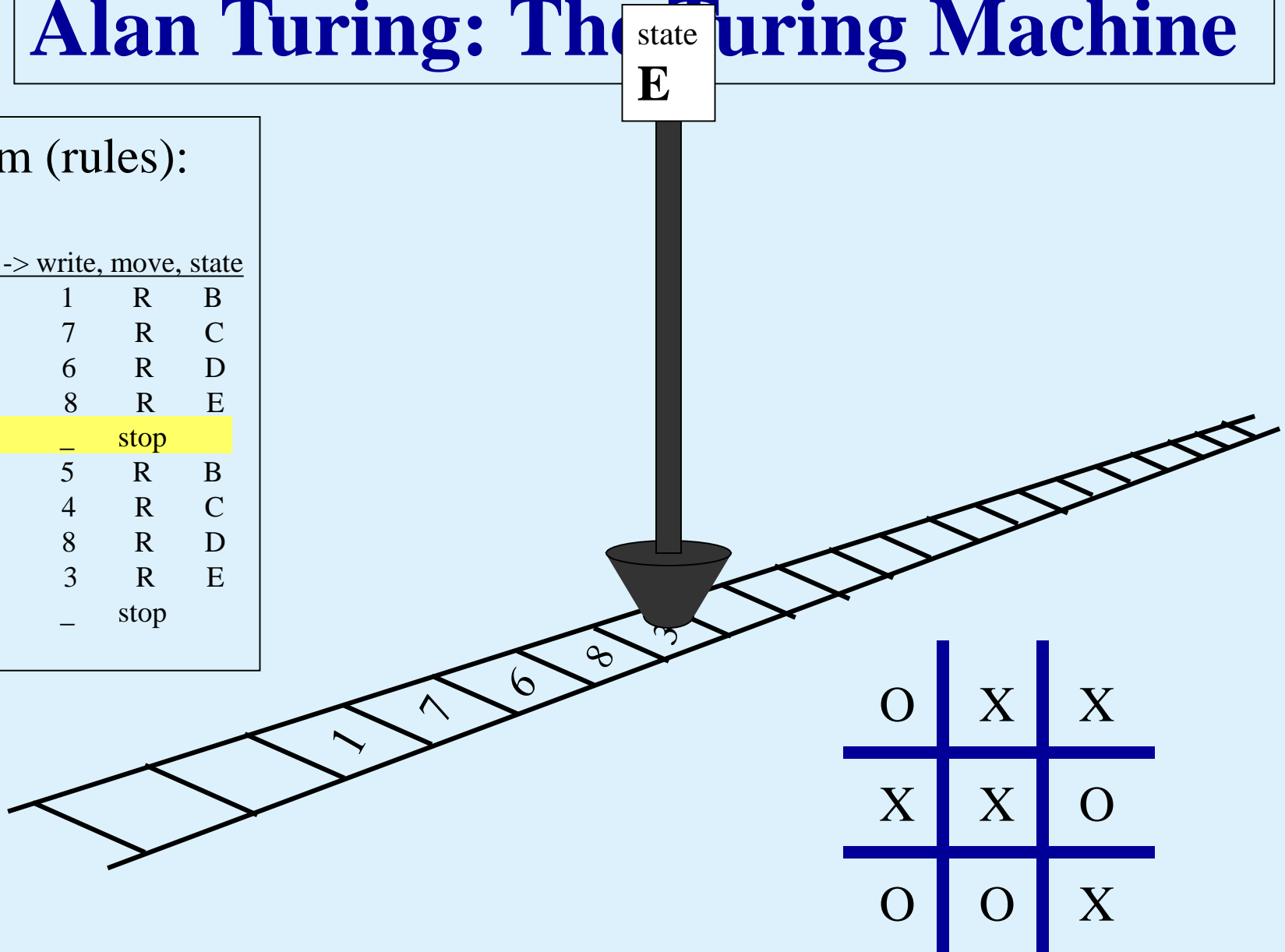| state, input	-> write, move, state			
A	5	1	R	B
B	9	7	R	C
C	4	6	R	D
D	2	8	R	E
E	3	_	stop	
A	1	5	R	B
B	7	4	R	C
C	6	8	R	D
D	2	3	R	E
E	9	_	stop	
(.......)				

Artificial Intelligence: How far have we come?

IBM 2014 Chip
     Parallel computing (4096 computers)
     46 billion operations per second
     Equivalent to 1,000,000 neurons (Bee brain)
Mouse Brain memory implant
     Tagged memory cells by observation
     Used optogenetics to implant associations
Brain-like tissue comprised of collagen and silk proteins

And…

Watson

Final thoughts: The Mind's Purpose

Why do we have a mind?
   To process info so we can make good decisions for the physical implementation of the mind (e.g., a person)

   But sometimes the mind's efficiency is compormised by the physical implementation...

Selecting a Mate

Rate 1 - 10 How important each of these are

Hotness

Patience

Flexibility

Wealth

Factors Importance Over Time

Qualities that increase in importance

Patience

Wealth

Flexibility

Qualities that decrease in importance

Hotness

Bad Decisions

Our physical implementation can lead to bad decisions. How intelligent is it to….

Buy a house while you are high on drugs

Decide whether or not you and your partner want to have a baby while you are drunk

Decide to accept a job while you are on heavy amounts of prescription pain killers

Decide to marry someone while under the influence of chemicals linked to infatuation /love

Love:
Nature's Trick of Biased Sampling

Early Dating
     "Love" chemicals biased sample
     Your behavior is biased sample of you
     Your partner's behavior is biased sample

How much of long term relationship will be spent in middle-old age?

Another Biased Sample

Who is the worst professor ever?

      McAwful!!!

What is the basis for this determination?
Who are the people who write reviews on Bruin Walk?

      Haters
      Lovers

What is the basis for their judgments?
What is the value of their judgments?

ANOTHER BIASED SAMPLE

Biased Samples

Early Dating

Playing with other people's kids
Fighting with someone you love
Job interviews
Inspirational speeches (Steve Jobs)
Politicians
People talking about politics
Evaluating your own behavior

Biased Samples The Bright Side

Tragedies reported on news

   Nanny killer

   Child abduction

Distribution Changes

   Kids problems sometimes disappear

   Spontaneous remission of health problems

Avoiding Biased Samples

Try and see whole distribution

Seek out new samples

   Unbiased (difficult to find)

   Biased in opposite direction

      Read national review online if you are liberal

      Read Huffington Post if you are conservative

Look for disconfirming evidence

Look for changes in distribution over time

Final Piece of Advice: Listen to My Mom

Date someone for at least two years before marrying someone

Wait until you are 30 before you get married (that's a joke), (no it isn't)