Artificial Intelligence

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Fall 2011
CS110: Introduction to Computing
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Now what?

- There is nothing more with respect to programming... anything that can be done, you now have the ability to do
- What can you do with your new skills?

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*There is no limit but your imagination **

Topics in Computer Science

- Artificial Intelligence (AI) - Logic, Machine Learning, Cognitive Science, Robotics, Game playing
- Networking and Information
- Security
- Graphics
- Computational Linguistics
- Programming Languages
- Emergence

What is Intelligence?

Three ways to define Intelligence

1) A specific set of abilities/behaviors
   - Play chess
   - Do math
   - Solve problems
   - Ability to learn

2) Operational definition

3) A specific set of structures
   - 100 billion neurons
   - 1 quadrillion to 500 trillion connections

Artificial Intelligence

Is it artificial like a **plastic flower** is to a real flower?

Or

Is it artificial like a **plane** is to a bird?

Operational Definitions

"I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description [hard-core pornography]; and perhaps I could never succeed in intelligibly doing so. **But I know it when I see it**, and the motion picture involved in this case is not that."

— Justice Potter Stewart, 1964

What is Intelligence?

- Alan Turing (1912 – 1954)
- Turing Machine – an abstract computer used to make proofs about what you can (and can't) compute
- Turing Test – an operational definition of intelligence

Artificial Intelligence

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Artificial Intelligence

Is it artificial like a **plastic flower** is to a real flower?

Weak AI

Or

Is it artificial like a **plane** is to a bird?

Strong AI

Turing Test, revised

- You talk to an entity via a chat program
- You try to guess if it is human or computer
- If you guess it is a human, and it is really a computer, then...

...it passes the Turing Test!

Tic Tac Toe

- Chapter 10 of your textbook
- “Zero-sum game”
  - Players get a +1/-1 (win/lose) or a 0/0 (draw)

Tic Tac Toe

```
def move(board, player):
    if player == “X”:
        square = input(“Your move:”)
    else:
        square = choice(possibleMoves(board, player))
    applyMove(board, player, square)
```

What can AI do?