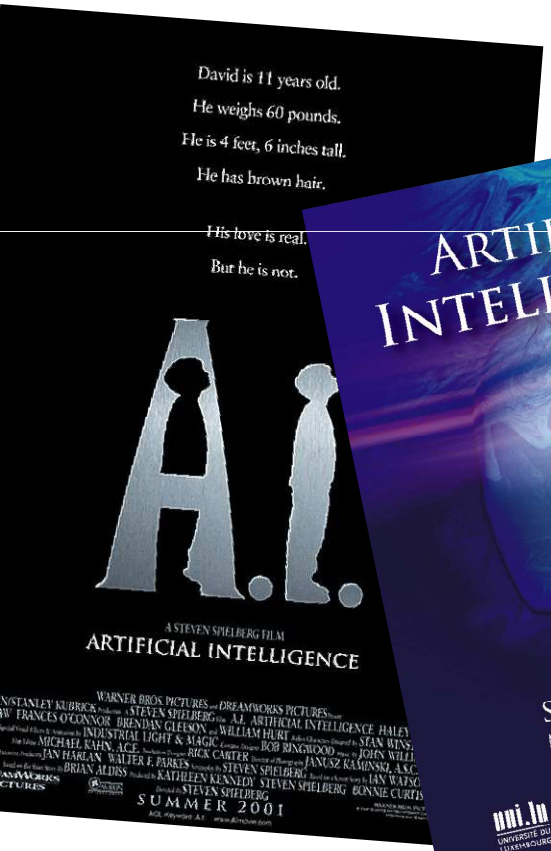
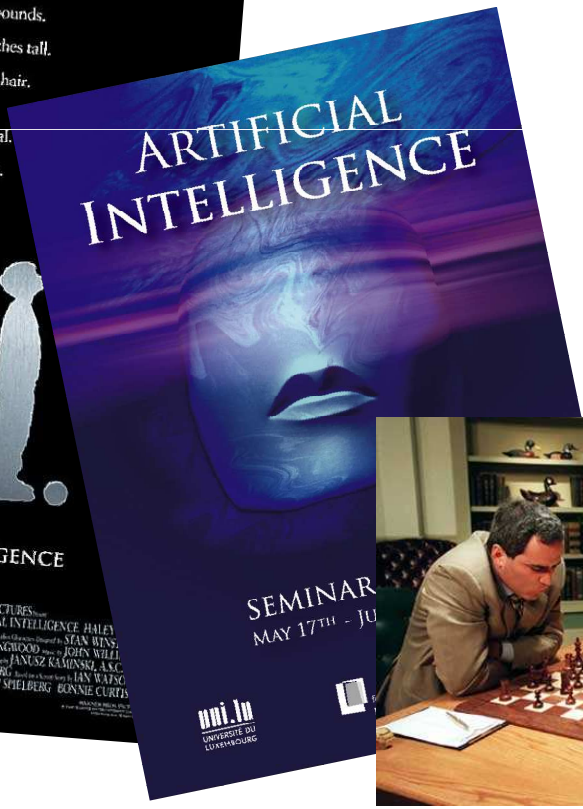
Where do all these ideas come from?





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Kasparov Proves No Match for Computer

By Rajiv Chandrasekaran
Washington Post Staff Writer
Monday, May 12, 1997; Page A01

NEW YORK, May 11 -- In a stunning showdown between man and machine, the IBM supercomputer Deep Blue decisively beat world chess champion Garry Kasparov today, the first time a computer has been able to best human player

upset Kasparov
out of the small
om after only about
f play, effectively
the sixth -- and final
with a scant 19 moves
Most chess experts
here said Kasparov, who

The Final Score:

Kasparov	Deep Blue
2.5	3.5

Replay the Games

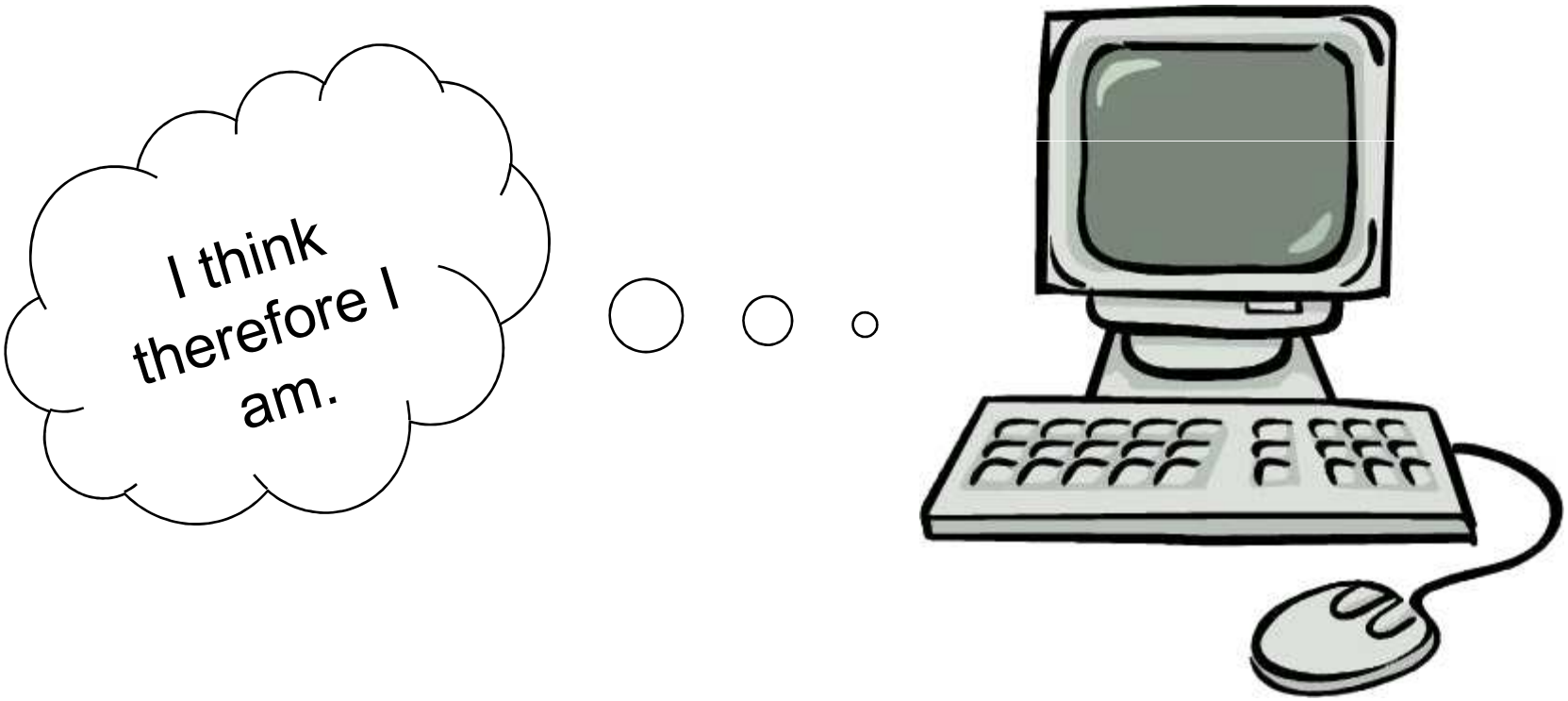
Review each move on a graphical chess board:

- Game 1: Kasparov
- Game 2: Deep Blue
- Game 3: Draw
- Game 4: Draw
- Game 5: Draw
- Game 6: Deep Blue

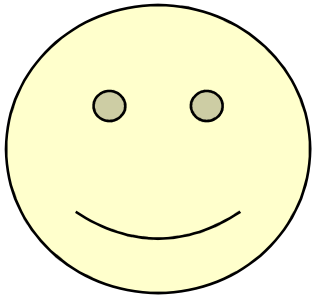
The beginning

- “Computing Machinery And Intelligence”
- Written by Alan M. Turing in 1950
- Who was Alan Turing?
  - Entscheidungsproblem, Turing Machine, German Enigma Code…

Can machines think?



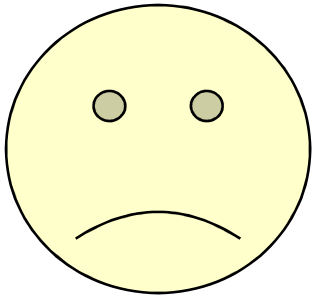
The Imitation Game



The Imitation Game

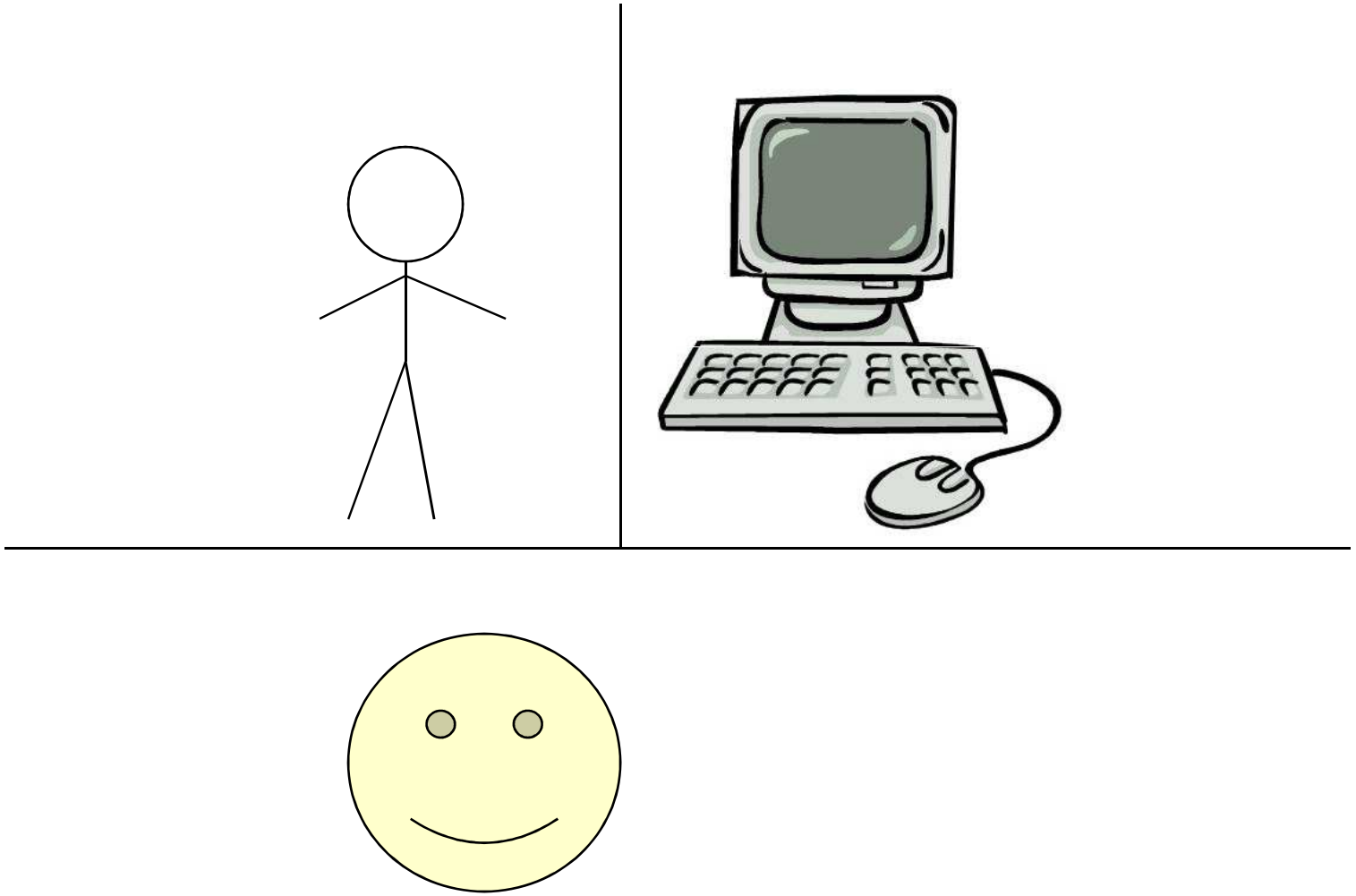
I am the woman, don't listen to him!

My hair is shingled, and the longest strands are about nine inches long.

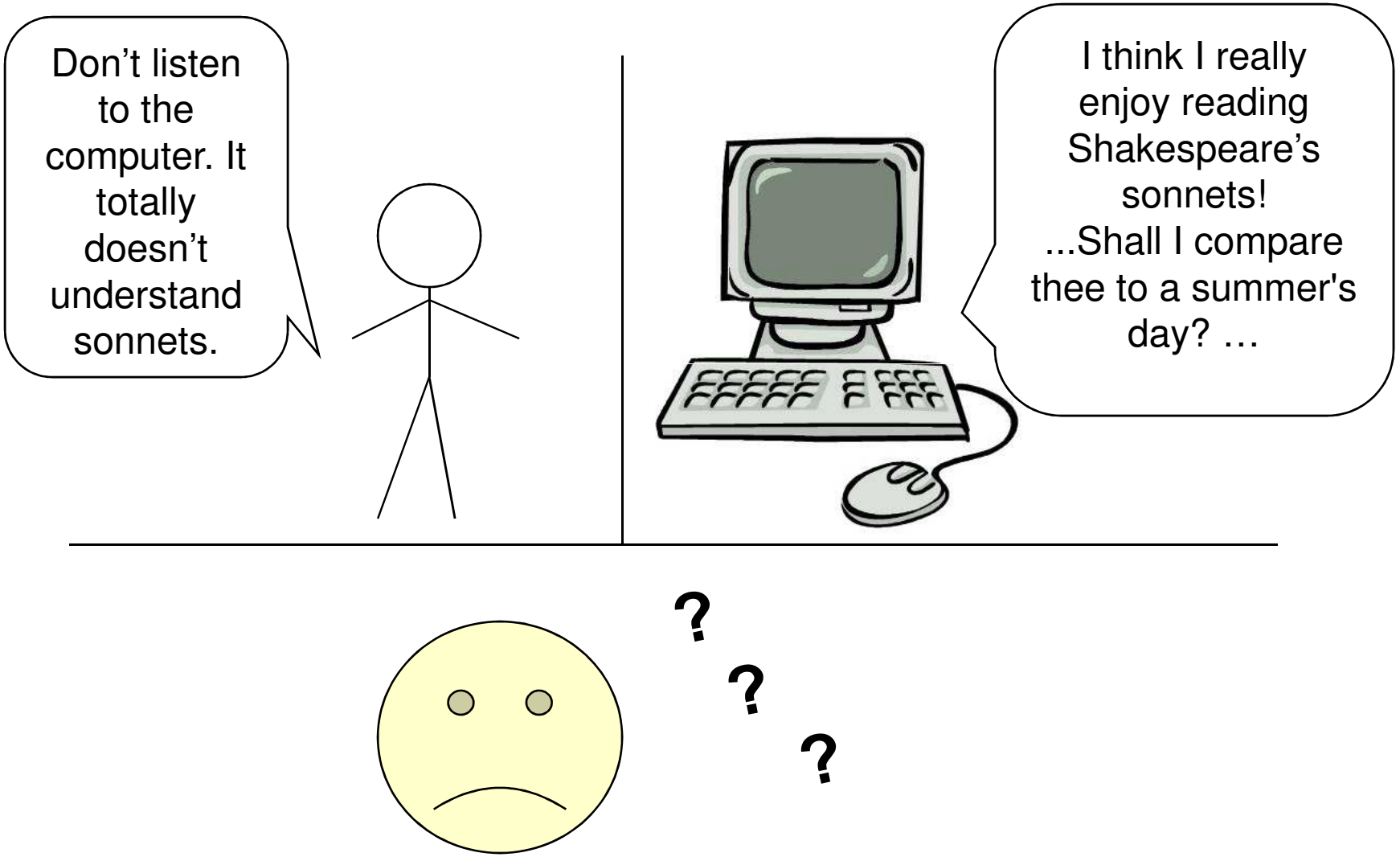


? ? ?

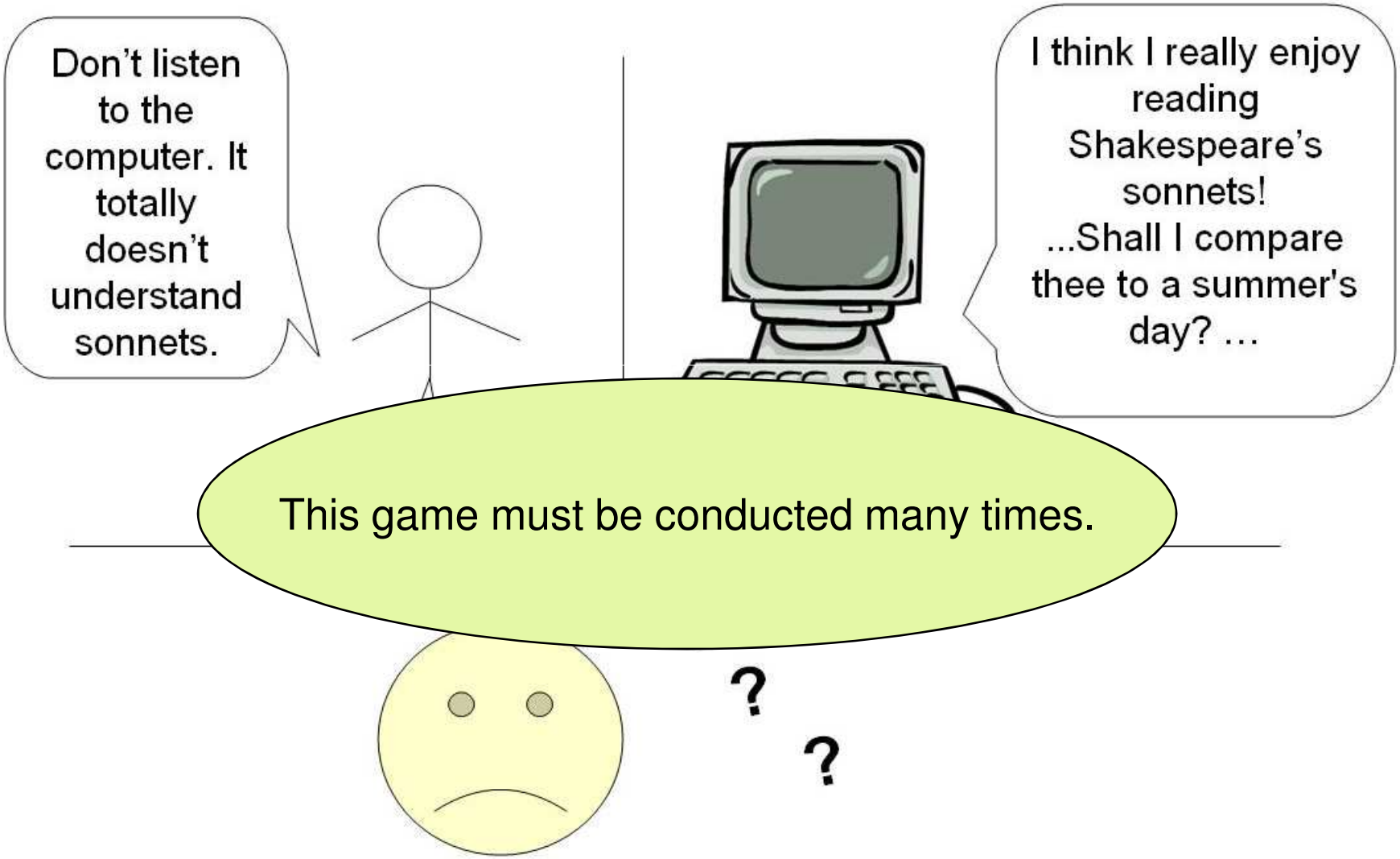
The Imitation Game again…



The Imitation Game again…



The Imitation Game again…



Advantages of this game

- Draws a sharp line between the physical and the intellectual capacities

  appearance, voice → irrelevant

Advantages of this game

- It is operational or behavioral.
  - Get around vague definitions of “machine” and “think”
- Open-ended → use any human experience to decide
- Statistical
  - Not won in a random way

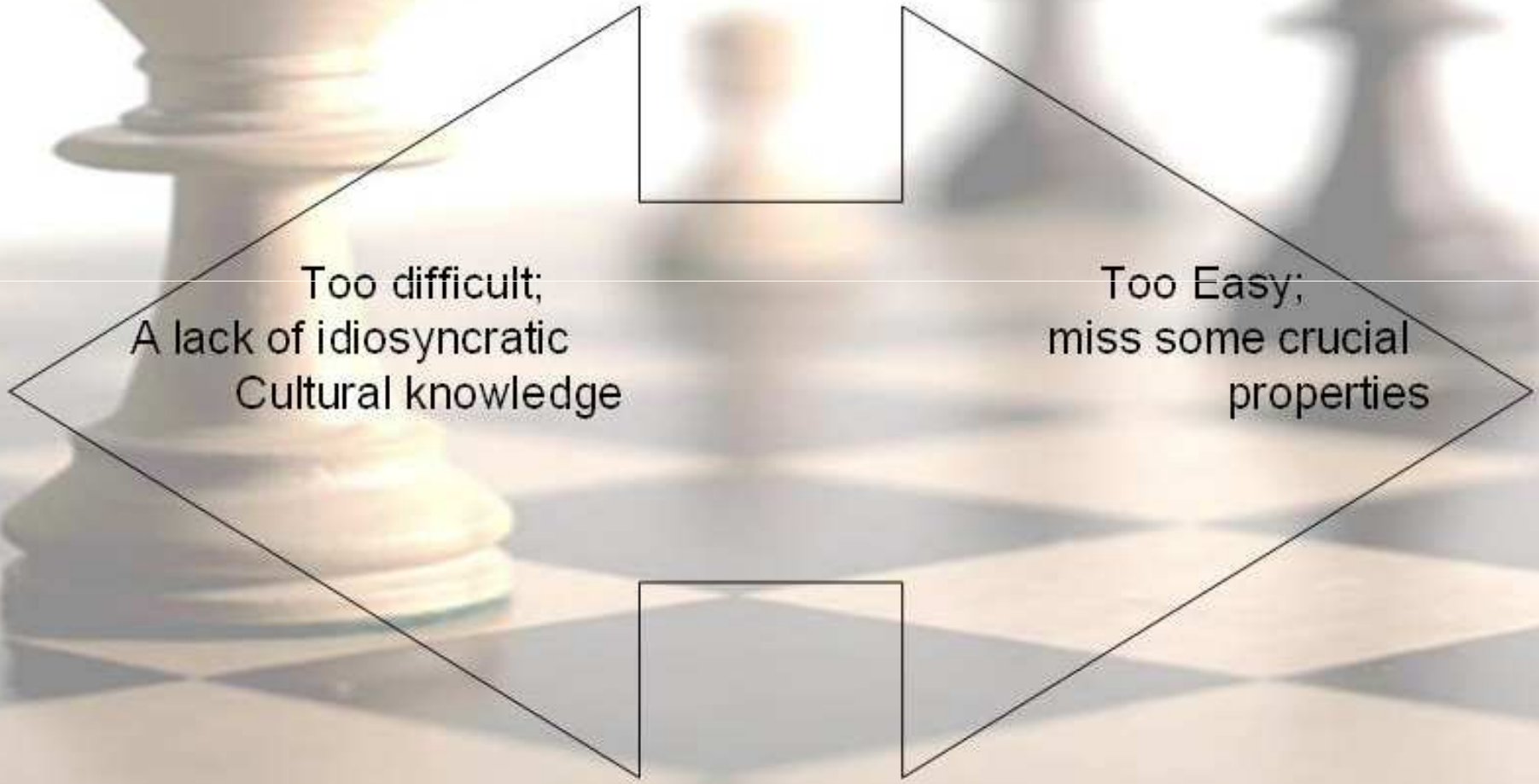
Critique of the New Problem

May not machines carry out something which ought to be described as thinking but which is very different from what a man does??

At least we can say that if, nevertheless, a machine can be constructed to play the imitation game satisfactorily, we need not be troubled by this objection.

The Big Question:

Is passing a Turing Test criterial for intelligence?



The machines concerned in the game are…

- Digital computers (Why?)
- Turing thinks that we don't need ask if the computers at present available(50's, 20th century) would win the game
- But whether there are imaginable computers which would do well.

The Digital Computers…

The digital computers

- Store
- Executive unit
- Control
  - Obey table of instructions
  - Duty of the control to see if these instructions are obeyed

The human computers

- Paper for calculation
- Desk machine
- Control
  - Obey book of rules
  - Has no authority to deviate from them

Constructing instruction tables is what we call "programming".

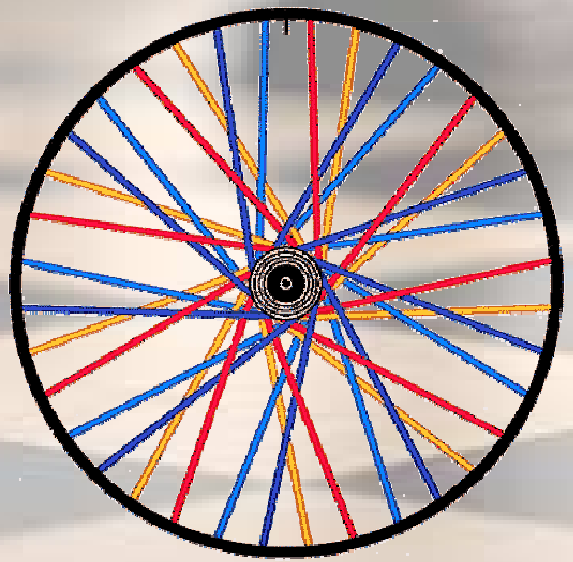
The Digital Computers…

- Digital computer with a random element

  →Free will?
- Electricity within digital computers and nervous system of humans…

Discrete-state Machines

- Wheel…
  - Three internal states
  - Two input signals
- Typical discrete-state machine
- Given the initial states of the machine and the input signals → possible to predict all future states and outputs



Laplace's view??

Laplace's view…

- Given the positions and velocities of particles, we can predict all future states…
- → All machines are deterministic!!
- There is no reason why it should not be carried out by a digital computer

Universality of Digital Computers

- It can mimic the behavior of any discrete-state machine
- Special property of digital computers
- This leads to…

An variant of our “Can machines think” question

- By modifying a digital computer to have an adequate storage, suitably increasing its speed of action, providing it with an appropriate programme, can it play satisfactorily in the imitation game?

Chat with AI

- http://www.pandorabots.com/pandora/talk?botid=f5d922d97e345aa1
- http://jabberwacky.com/