

Can Computers Think?

Phil Bass, October 2024

What Is A Computer?



A Computer Is ...

- ★ A general-purpose information processing machine
- ★ An electronic brain

It Can ...

1. Store and retrieve information
2. Manipulate information in any way you like

A Human Brain Is ...

- ★ A prediction engine
- ★ A general-purpose information processing machine?
- ★ A biological brain

It Can ...

1. Store and retrieve information
2. Manipulate information in any way you like
3. And, what else?

What do we mean by 'thinking'?



Thinking is ...

- ★ Remembering information (what's that actor's name?)
- ★ Processing information ($2 + 2 = 4$)
- ★ Making decisions (where shall we go for a holiday?)
- ★ Solving problems (how much wallpaper do we need?)
- ★ Planning (the quickest way home)
- ★ Evaluating (chess board position)
- ★ Posing questions for ourselves (what if ...?)
- ★ Learning (how to play Bridge)
- ★ Creating new concepts (poetry, music, art, technology)

Do these things need a human brain?
A biological brain?
Or could they be done by an electronic brain?

– Phil Bass, Mini-Lesson, 1996

Can a computer do these?

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“... when the four colour problem was proved eventually in 1976, it was by a proof which used a computer in an essential way - not just because it was extremely long and complex, but because the program was able to generate lines of attack more ingeniously than those of the human mathematicians.”

– *Alan Hodges in “Alan Turing: The Enigma”*

What Is Your Computer Thinking?

