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CSC 416

Prologue: Terrified - Reading/Mining/Discussion Assignment

1). Google started out in 1998 with one "product". What was that "product"?
Google's starter product was a website that used a new and successful method for searching the web.

2). In 2011, Google created an internal AI research group. What is this group called?
The internal AI research group founded by Google was called Google Brain.

3). What is the glue that unifies the diverse products, services, and blue-sky research efforts offered by Google and its parent company, Alphabet?
AI is the glue that unified these diverse groups of products, services, and research efforts.

4). What is Google's ultimate aspiration, as reflected in the original mission statement of its DeepMind group?
Google's ultimate aspiration is "Solve intelligence and use it to solve everything else".

5). Written in the 1970s, GEB was an outpouring of his many intellectual passions – mathematics, art music, language, humor, and wordplay, all brought together to address the deep questions of how intelligence, consciousness, and the sense of self-awareness that each human experiences so fundamentally can emerge from the non-intelligent, non-conscious substrate of biological cells. It's also about how intelligence and self-awareness might eventually be attained by computers. Who is he?
GEB was an outpouring of Hofstadter's many intellectual passions.

6). If you're a computer scientist, or a computer enthusiast, it's likely you've heard of it, or read it, or tried to read it. What is it?
A book titled: "Gödel, Escher, Bach: an Eternal Golden Braid", or GEB is heard of by many computer scientists and enthusiasts.

7). What did the magnetic button affixed to the Sigma-2 mainframe computer that her hobbyist/engineer dad built in MM's childhood home proclaim?

The refrigerator-sized machine wore a magnetic button proclaimed 'I pray in FORTRAN'.

8). He described how, when he first started working on AI in the 1970s, it was an exciting prospect but seemed so far from being realized that there was no "danger on the horizon, no sense of it actually happening." Creating machines with humanlike intelligence was a profound intellectual adventure, a long-term research project whose fruition, it had been said, lay at least "one hundred Nobel prizes away." Whose perspective, in particular, on AI research are captured in these two sentences?

The perspective of Hofstadter was captured in these two sentences.

9). In the relatively early years of computing machines, those who believed that AI was possible in principle considered these two philosophers, in particular, to be 'the enemy' due to their passionate arguments against the possibility of AI. Who were these two Berkeley philosophers?

John Searle and Hubert Dreyfus considered AI impossible in the early days.

10). Near the end of GEB, Hofstadter had listed "Ten Questions and Speculations" about artificial intelligence. One of the questions was: "Will there be chess programs that can beat anyone?" What, beyond the word "no," did Hofstadter have to say in his speculation about this?

He said that there may be an AI that can achieve this, but such AI will be general intelligence, not exclusive to chess players.

11). In formulating his "dead wrong" speculation, Hofstadter was influenced by Eliot Hearst, a chess champion and psychology professor who had written extensively on how human chess experts differ from computer chess programs. Characterize Hearst's review of how human experts engage in the play of the game.

Hearst said that humans can quickly recognize the pattern of the chessboard, and form strategies of higher concepts.

12). IBM's Deep Blue machine? Please say a little something about it.

By the mid-1990s, the Deep Blue Machine with specialized hardware had reached the Grandmaster level in chess.

13). After describing EMI, Hofstadter had asked the audience – including several music theory and composition faculty – to guess which of two pieces a pianist played from them was a (little-known) mazurka by Chopin and which had been composed by EMI. As one audience member described later, "The first mazurka had grace and charm, but not 'true-Chopin' degrees of invention and large-scale fluidity … The second was clearly the genuine Chopin, with a lyrical melody; large-scale, graceful chromatic modulations; and a natural, balanced form." Many of the faculty agreed and, to Hofstadter's shock, voted EMI for the first piece and "real-Chopin" for the second piece. The correct answers were the reverse. Where did this scenario take place?

This scenario took place at the prestigious Eastman School of Music, in Rochester, New York.

14). Which word best describes Hofstader's feeling about what Google itself is trying to accomplish in AI – self-driving cars, speech recognition, natural-language understanding, translation between languages, computer generated art, music composition, and more?

Terror, he felt terrified.

15). Hofstadter's worries are underlined by Google's embrace of Ray Kurzweil and his vision of the Singularity. What exactly is Singularity?

Singularity is in which AI, empowered by its ability to improve itself and learn on its own, will quickly reach, and then exceed, human-level intelligence.

16). Hofstadter's feeling of terror with respect to AI was not about AI becoming too smart, too invasive, too malicious, or even too useful (and thus displacing workers). What was his terror with respect to AI about?

He is terrified by how fast it's happening, he doesn't want him or his children left in the dust. And when it does, what he most valued in humanity, the complexity and emotional depth, could be trivialized by a small chip.

17). Is Hofstadter a materialist?

No, Hofstadter didn't mention anything about money during the meeting.

18). Mitchell quotes three well-known humans who have emphatically expressed their concerns about AI. Who are these three, and what did each have to say?

- Stephen Hawking (physicist): The development of full artificial intelligence could spell the end of the human race.
- Elon Musk (Entrepreneur): Artificial intelligence is probably 'our biggest existential threat' and that 'with artificial intelligence we are summoning the demon.'
- Bill Gates (Microsoft): Agree with Elon Musk and said people should be concerned.

19). Mitchell quotes three well-known people who argue that worries about AI are premature, at best. Who are these three, and what did each have to say?

- Mitchell Kapor: Human intelligence won't be duplicated anytime soon.
- Rodney Brooks: We grossly overestimate the capabilities of machines.
- Gary Marcus: There has been almost no progress in creating strong AI.

20). In the last paragraph of the prologue, Mitchell articulates what the book is about. What does she say?

This book is not a general survey or history of AI, rather it's an in-depth exploration.