

readable account of the philosophical and practical problems of AI. Significant early papers in AI are anthologized in the collections by Webber and Nilsson (1981) and by Luger (1995). The *Encyclopedia of AI* (Shapiro, 1992) contains survey articles on almost every topic in AI, as does Wikipedia. These articles usually provide a good entry point into the research literature on each topic. An insightful and comprehensive history of AI is given by Nils Nilsson (2009), one of the early pioneers of the field.

The most recent work appears in the proceedings of the major AI conferences: the biennial International Joint Conference on AI (IJCAI), the annual European Conference on AI (ECAI), and the National Conference on AI, more often known as AAAI, after its sponsoring organization. The major journals for general AI are *Artificial Intelligence*, *Computational Intelligence*, the *IEEE Transactions on Pattern Analysis and Machine Intelligence*, *IEEE Intelligent Systems*, and the electronic *Journal of Artificial Intelligence Research*. There are also many conferences and journals devoted to specific areas, which we cover in the appropriate chapters. The main professional societies for AI are the American Association for Artificial Intelligence (AAAI), the ACM Special Interest Group in Artificial Intelligence (SIGART), and the Society for Artificial Intelligence and Simulation of Behaviour (AISB). AAAI's *AI Magazine* contains many topical and tutorial articles, and its Web site, [aaai.org](http://aaai.org), contains news, tutorials, and background information.

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## EXERCISES

These exercises are intended to stimulate discussion, and some might be set as term projects. Alternatively, preliminary attempts can be made now, and these attempts can be reviewed after the completion of the book.

**1.1** Define in your own words: (a) intelligence, (b) artificial intelligence, (c) agent, (d) rationality, (e) logical reasoning.



**1.2** Every year the Loebner Prize is awarded to the program that comes closest to passing a version of the Turing Test. Research and report on the latest winner of the Loebner prize. What techniques does it use? How does it advance the state of the art in AI?

**1.3** Are reflex actions (such as flinching from a hot stove) rational? Are they intelligent?

**1.4** There are well-known classes of problems that are intractably difficult for computers, and other classes that are provably undecidable. Does this mean that AI is impossible?

**1.5** The neural structure of the sea slug *Aplysia* has been widely studied (first by Nobel Laureate Eric Kandel) because it has only about 20,000 neurons, most of them large and easily manipulated. Assuming that the cycle time for an *Aplysia* neuron is roughly the same as for a human neuron, how does the computational power, in terms of memory updates per second, compare with the high-end computer described in Figure 1.3?

**1.6** How could introspection—reporting on one's inner thoughts—be inaccurate? Could I be wrong about what I'm thinking? Discuss.