

1 Choose the correct answer.

1 When was the field of Artificial Intelligence (AI) given its name?
a 1956 **b** 1986
c 2006

2 Which key technology is behind AI?
a machine learning **b** physics
c robotics

3 How do AI programs learn from mistakes?
a They are punished. **b** They are given rewards.
c They are shown error messages.

4 Which of the following medical tasks would an AI system be most likely to do?
a Talk to patients to find out how they feel. **b** Operate on a patient.
c Give a diagnosis from test results or medical images.

5 What could really be at risk from AI in the near future?
a our health **b** our jobs
c our planet

6 What can AI programs not do very well at present?
a make decisions **b** learn new things
c be creative

2 Complete these sentences with the name of the person or company and what they did.

Thomas Nagel	Rodney Brooks	John McCarthy	IBM
Frank Rosenblatt	DeepMind	Arthur Samuel	Alan Turing

Atari video games	behavioural AI	checkers	field of AI
chess	computer	perceptron model	consciousness

- 1** first invented the, and not long after that, the field of AI itself.
- 2** gave the name to the

- 3 used heuristic search to write a program to play
- 4 developed a different AI theory known as, which looked at how particular behaviours played a part in the way an intelligent system worked.
- 5 was able to show that an AI system called DeepBlue could consistently beat Russian champion Garry Kasparov.
- 6 developed the first neural net model to be actually used, called the
- 7 trained an AI program to play forty-nine from the early 1980s.
- 8 developed one of the most famous tests of, which considers whether the question “What is it like to be an X?” is meaningful when applied to different things.

3 Match the types of AI in the box with the definitions.

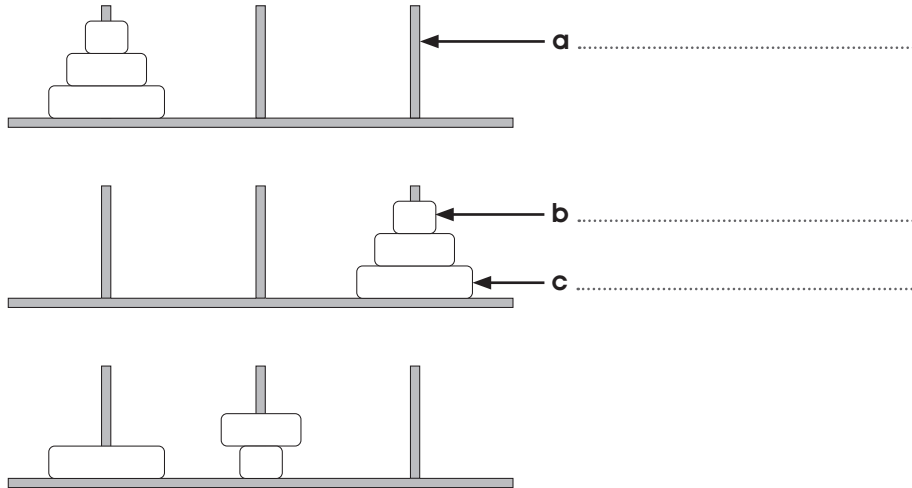
symbolic AI	knowledge-based AI	behavioural AI	
general AI	logic-based AI	weak AI	strong AI

- 1 The idea that human knowledge about a problem should be explicitly captured and used within an AI system.
- 2 A type of AI in which intelligent decision-making is reduced to logical reasoning, as with first-order logic.
- 3 A type of AI with its attention on behaviours, or the different things a system should do, before considering how the systems are linked.
- 4 The goal of building machines which appear to have understanding without explicitly saying that they actually have these things.
- 5 The goal of building AI systems that really do have mind, consciousness, awareness and so on in the way that we do.
- 6 The goal of building AI systems with all the abilities that humans have.
- 7 A type of AI that involves modelling reasoning and planning processes.

4a Label the diagrams with the words in the box.

ring post smaller ring

The Towers of Hanoi



4b Read the rules, then complete the solution of the puzzle with the words in the box.

Rules

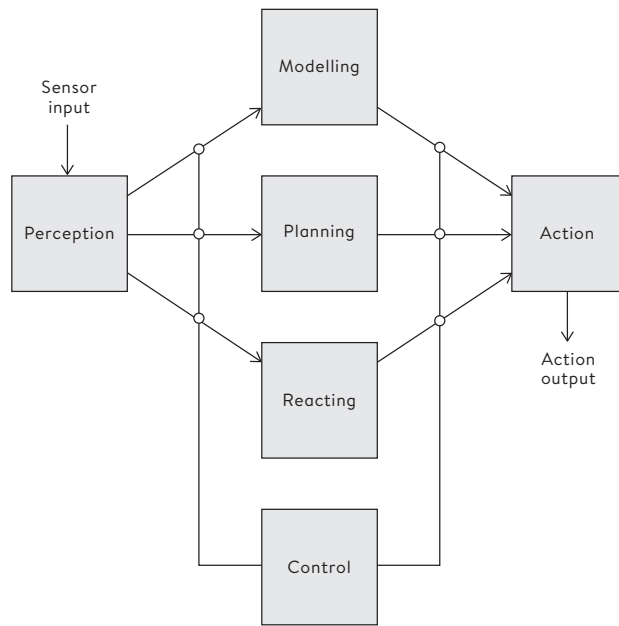
- 1 Only one ring can be moved at a time between the posts;
- 2 At no time can any ring lie on a smaller ring.

Solution

transforms goal new initial process states

- First, we consider the effects of every available action on the ¹..... state. The effect of performing an action ²..... the problem into a ³..... state.
- The solution to the puzzle is the sequence of actions that got us from the initial state to the ⁴..... state.
- If not, we repeat this ⁵..... for every state we achieved, considering the effect of each action on those ⁶..... , and so on.

5 Look at the model and choose the correct words to complete the description.



A typical design for an agent, called TouringMachines, divided ¹ **action** / **control** into three smaller sub-systems. The ² **planning** / **reactive** sub-system worked like Brooks' subsumption architecture and was responsible for situations that required a quick response and no reasoning, such as ³ **avoiding** / **hitting** obstacles. The ⁴ **modelling** / **planning** sub-system was responsible for working out how to achieve the agent's goals. The ⁵ **modelling** / **perception** sub-system handled interactions with other agents. The three control sub-systems were linked by another control sub-system, which listened to what each one suggested and then decided which to ⁶ **follow** / **stop**. This was often a very simple decision, such as: if the reactive sub-system says "STOP!", then you should listen.

6a Explain what these things are. Use the words in the box to help you.

social media activity keyword computer environment
 user system game real details situation task

1 chatbots

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2 software agent

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3 simulated robot

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4 programming language

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5 puzzle

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6 interface

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6b Describe a chatbot, software agent, robot, programming language, online game, puzzle or interface that you have used or know about.

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7a Put these things in order of how important you think they are to your life. Write something positive and something negative next to each one.

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|-------------------------|-------------------------|-----------------------|
| vacuuming robot | wearable health devices | automated translation |
| driverless car | autonomous drones | image captioning |
| virtual-reality glasses | automated diagnosis | |

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7b Compare your list with a partner. Consider the positive and negative points about each thing and agree on the top three things you would like to see AI used for in your life.

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8 Imagine that you are at a meeting to decide whether driverless cars should be allowed to drive around your town or city. At the end of the meeting, vote for the best solution. Write down your reasons for your decision.

You should consider:

- the level of autonomy they should have.
- when and where they should/should not be able to drive.
- whether they should have special lanes like buses and cycles.
- if they should have safety drivers.
- if they should have additional sensors or safety technology.
- who should be held responsible if there is an accident.
- how to move from driven to driverless cars.
- the trolley problem (see Chapter Thirteen).

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