

A company provides a social media service through which members can share information about themselves and view information and news from their friends.

Discuss:

- how algorithms might determine which current affairs news stories to display to an individual member
- the moral, ethical and legal considerations that the developers of the system and its operators should consider in relation to how the algorithms work and which news stories are displayed.

**[6 marks]**

[illegible]



Big Data is an important application area for modern computer science.

- Describe what Big Data is, using examples to illustrate your description.
- Explain some of the challenges that Big Data brings with it and the approaches that can be taken to overcome these, in relation to programming and hardware.
- Consider some of the ethical and legal issues that might arise in applications that store data, particularly data about people.

**[12 marks]**

[illegible]



**0 3**

A supermarket chain uses a system which stores details of all of the products that it sells and the sales that it makes.

The data that the supermarket stores is Big Data.

**0 3 . 1**

Two characteristics of Big Data are that the volume of data means it is too big to fit on a single server and the data comes in a variety of forms.

Describe the third characteristic of Big Data.

**[1 mark]**

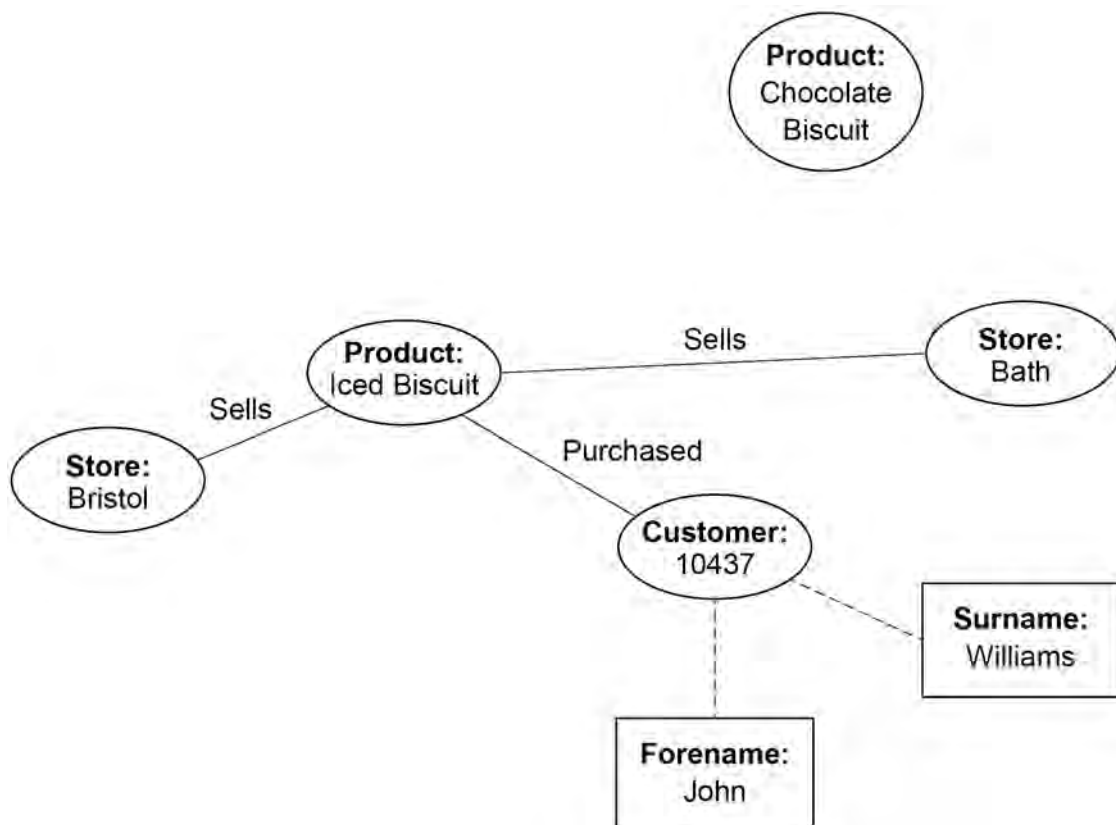
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The graph schema in **Figure 8** represents part of a fact-based model of the dataset that the supermarket has built.

**Figure 8**



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**0 3 . 2** Modify the graph schema in **Figure 8** to represent the following additional facts.

- The Bath store sells chocolate biscuits.
- There are 20 individual biscuits in a packet of iced biscuits and each packet costs £1.50
- Both chocolate biscuits and iced biscuits are made by the company Delicious Snacks. The company has 75 employees and also makes cake bars.

**[3 marks]**

**0 3 . 3** One approach to dealing with Big Data is to write code that can be distributed to run across more than one server.

State **two** features of functional programming languages that make it easier to write code that can be distributed to run across more than one server.

**[2 marks]**

Feature 1 \_\_\_\_\_

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Feature 2 \_\_\_\_\_

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A functional programming function  $f$  has the function type:

$$f: \mathbb{N} \rightarrow \mathbb{R}$$

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Describe **two** features of functional programming languages that make it easier to write code that can be distributed to run across multiple servers.

**[2 marks]**

Feature 1 \_\_\_\_\_

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Feature 2 \_\_\_\_\_

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