

1.4 DATA TYPES & STRUCTURES · 1.4.1

Primitive types, binary & hexadecimal

Original practice questions · 30 marks · about 40 minutes · spec 1.4.1(a)(b)(e)(f)

Instructions. Answer all questions. The number of marks is shown in brackets []. Show your working for conversions.**1** Total: 4 marks

A program stores information about items in a shop.

- (a) State the most suitable data type for the **price** of an item. _____ [1]
- (b) State the most suitable data type for the **number in stock**. _____ [1]
- (c) State the most suitable data type for **whether the item is on sale**.
_____ [1]
- (d) State the most suitable data type for the item's **name**. _____ [1]

2 Total: 4 marks

- (a) Convert the binary number 01101010 to denary. Show your working. [2]
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- (b) Convert the denary number 200 to an unsigned 8-bit binary number. Show your working. [2]
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3 Total: 5 marks

- (a) Convert the hexadecimal number 2F to denary. Show your working. [2]
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- (b) Convert the binary number 11010110 to hexadecimal. [2]
-
- (c) Convert the hexadecimal number A to a 4-bit binary number. _____ [1]

4

Total: 5 marks

- (a) Show that the denary number 149 is equivalent to the binary number 10010101. [3]

- (b) Convert 149 to hexadecimal. [2]

5

Total: 5 marks

MAC addresses are written as six pairs of hexadecimal digits, for example 3A-1F-...

- (a) Convert the pair of digits 3A to an 8-bit binary number. [2]

- (b) State how many bytes a six-pair MAC address occupies. [1]

- (c) Explain why a MAC address is expressed in hexadecimal rather than in pure binary. [2]

6

Total: 7 marks

- (a) In an 8-bit system, explain how to work out how many different values can be represented. [2]

- (b) State the largest unsigned denary value that can be stored in 8 bits. [1]

- (c) Explain why computers represent data using the binary number system. [2]

- (d) A colour is stored as the hexadecimal value FF for one channel. Convert FF to denary, and state what this represents about the channel's intensity. [2]

END OF QUESTIONS