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GCSE COMPUTING

A453 Programming Project

CONTROLLED ASSESSMENT MATERIAL 2

This assessment may be periodically reviewed. Please check on OCR Interchange that you have the Controlled Assessment material valid for the appropriate assessment session.



INSTRUCTIONS TO TEACHERS

- Please refer to Section 4 of the GCSE Computing specification for instructions on completing this controlled assessment task.
- The marking criteria should be available to candidates whilst completing the tasks.
- The quality of written communication will be assessed in the testing section.
- The total number of marks for this unit is **45**.

INFORMATION FOR CANDIDATES

- This document consists of **4** pages. Any blank pages are indicated.

Teachers are responsible for ensuring that assessment is carried out against the Controlled Assessment set for the relevant examination series (detailed above).

Assessment evidence produced that does not reflect the relevant examination series will not be accepted.

This assessment consists of three tasks.

Candidates should complete all tasks and provide evidence to meet all the marking criteria.

For the following scenario analyse the detailed requirements for each situation and, using suitable algorithms, design a solution to be coded in a suitable high-level programming language. Show the iterative development of the individual solutions with suitable testing throughout the process. Test the final products and evaluate your solutions against the detailed requirements you identified in the analysis.

The results for a task may be used without further testing in any subsequent task, or each of the tasks may be solved as a separate system.

Stock control

Products are identified by a GTIN-8 (Global Trade Item Number), this is often represented using a barcode.



In the barcode above, the GTIN-8 is 1324 5627.

The GTIN-8 uses a seven digit code plus a check digit for validation. The eighth digit of a GTIN-8, the check digit, is calculated as follows:

| | Position of Digit (D) | | | | | | | |
|--|-----------------------|----|----|----|----|----|----|----|
| GTIN-8 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 |
| Multiply the seven digits in order alternately by 3 then 1 | | | | | | | | |
| | ×3 | ×1 | ×3 | ×1 | ×3 | ×1 | ×3 | |
| Add the outcomes together to get a sum | | | | | | | | |
| Subtract the sum from the nearest equal or higher multiple of 10 | | | | | | | | |
| The result is the eighth digit of the GTIN-8, the check digit | | | | | | | | |

For example, the seven digits 1324562:

| GTIN-8 | 1 | 3 | 2 | 4 | 5 | 6 | 2 | D8 |
|--|----|----|----|----|----|----|----|----|
| Multiply the seven digits in order alternately by 3 then 1 | | | | | | | | |
| | ×3 | ×1 | ×3 | ×1 | ×3 | ×1 | ×3 | |
| | 3 | 3 | 6 | 4 | 15 | 6 | 6 | |
| The sum is 43 | | | | | | | | |
| Subtract 43 from 50 to get the check digit 7 | | | | | | | | |
| The resulting GTIN-8 is 13245627 | | | | | | | | |

Repeating the process of multiplying by 3 then 1 will give a sum that is a multiple of 10 that can be used to check the validity of the GTIN-8 product code.

For example, the eight digits 13245627:

| | | | | | | | | |
|--|----|----|----|----|----|----|----|----|
| GTIN-8 | 1 | 3 | 2 | 4 | 5 | 6 | 2 | 7 |
| Multiply the eight digits in order alternately by 3 then 1 | | | | | | | | |
| | ×3 | ×1 | ×3 | ×1 | ×3 | ×1 | ×3 | ×1 |
| | 3 | 3 | 6 | 4 | 15 | 6 | 6 | 7 |
| The sum is 50, a multiple of 10, therefore valid | | | | | | | | |

Task 1

Analyse the requirements for this system and design, develop, test and evaluate a program to:

- Calculate the GTIN-8 product code from a seven digit number
- Check the validity of an eight digit GTIN-8 code

Task 2

Create a suitable text file to use with a high-level programming language containing a list of product details, including a GTIN-8 product code, a product description and price.

The program should allow a user to enter GTIN-8 codes for a list of products they wish to purchase and the quantity required of each product. The program should search the stock file to produce a list of products with their descriptions, prices, cost for each of the quantity selected and the total cost for all of the products. The program should also identify products not found.

| | | | | |
|---------------------|-------------------|----|------|-------|
| 34512340 | plain brackets | 4 | 0.50 | 2.00 |
| 98981236 | product not found | | | |
| 56756777 | 100mm bolts | 32 | 0.20 | 6.40 |
| 90673412 | L-shaped brackets | 6 | 1.20 | 7.20 |
| Total cost of order | | | | 15.60 |

Analyse the requirements for this system and design, develop, test and evaluate a program to allow a user to enter GTIN-8 codes for a list of products and a quantity. The program should produce a receipt, i.e. a list of products with descriptions, prices, cost for each of quantity selected and the total cost of all the products ordered.

Task 3

Develop a program that will update stock levels following an order. In the stock file include a current stock level, re-order level and target stock level (the number of products required in stock after the product is re-stocked). The program should, when instructed to do so, calculate which products are out of stock or below the re-order level and create a file. This file will contain orders for re-stocking that will bring the current stock level of these products up to the target stock level.

Analyse the requirements for this system and design, develop, test and evaluate a program to update stock levels following an order and create an order for re-stocking that brings the stock levels for products that are out of stock or below the re-order level up to the target stock level. You will need to create a suitable stock file and a series of orders to test this system.

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