

**Coursework Task
C206 12**

Higher Computing

Valid for session 2009/2010 only

Coursework Task

Subject: Computing

Level: Higher

Publication date: October 2009

Publication code: BB3416

Published by the Scottish Qualifications Authority

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Section 1

Organisation and Conditions for Assessment

Organisation and Conditions for Assessment

The assessment is designed to test the candidates' ability to apply knowledge and understanding and practical skills, developed through study of the Computer Systems and Software Development Units.

The notional design length for the assessment is 8 – 10 hours. However, a candidate may be allowed longer than this if required. Section 2 and the Marking Grid in Section 3 should be given to the candidates.

The assessment is to be undertaken under “open book” conditions, but under supervision to ensure that the work submitted is the candidate's own work. The tutor may give the candidate hints and/or help if requested. Any such help should be reflected in the marks awarded. Once the task has been completed and marked, it should not be returned to the candidate for further work.

The task is designed to discriminate between candidates and, therefore, would be expected to provide a wide range of marks. Stronger candidates should be able to complete the task successfully, and without tutor assistance, within the suggested time. Weaker candidates might not complete all aspects of the task within a reasonable time, or may require significant assistance, and so would achieve a lower total mark. Note that there is no requirement for a candidate to achieve a threshold to “pass” the assessment.

The mark obtained out of 60 should be submitted to the SQA unscaled. This will be combined with the Question Paper mark out of 140 to establish the candidate's overall grade of award. The Coursework mark should also be used in preparation of estimate grades.

Marking Guidelines (Section 3)

In addition to the Marking Grid, which can be issued to candidates, further guidelines for teachers have been included in Section 3. These are included to give further assistance to teachers and must **not** be issued to candidates.

Section 2

Coursework Task

Coursework Task

Higher Computing Coursework Task 2009–2010

Part 1

Click-Kit, a company which sells photographic equipment, decides to commission a software development company to produce a stock control program that will:

- store the names of items held in stock
- calculate product codes of held items
- produce a list of products stocked, with their initial stock levels
- allow information on products held in stock to be found
- allow products to be purchased
- produce a list of final stock levels, indicating which items need to be re-stocked.

The names of five digital cameras and their stock levels which should be used in testing the program are given below.

Product Name	Stock Level
Simpsun GN120	1
Sonic Lux10	2
Ultimax G42	4
Antalpha A200	3
Nickov N230	2

You may use any suitable method available in your programming environment to enter this data into the system.

How the program should work

Storing the Product Names

The program should take in the product names and initial stock levels. It should store them in a suitable data structure.

Calculating and Storing the Product Codes

The program should calculate the product codes using the first three and last three characters of the product name. It should store them in a suitable data structure.

Displaying the Initial Stock List

The program should display a list of the product names, their product codes and the initial stock levels (see page 8 for an example layout).

Displaying a Menu

The program should then offer the user the following three menu options:

- **Finding a Product**

The program should ask the user for a **product code** then find the product. If the product code is **not** found then an appropriate message should be displayed. Otherwise it should display the product name, product code and stock levels.

- **Purchasing an Item**

The program should ask the user to enter the product code of an item. If the product is **not** in stock a suitable error message should be displayed. Otherwise a suitable message should be displayed confirming it is in stock and confirming the purchase. The stock level for that item should then be decreased by one.

Note: this part of the program should be tested by the user purchasing a **Sonic Lux10** and **Nickov N230**.

- **Quit**

The program should display a suitable message.

Displaying the Final Stock List

After quit is chosen, the program should display a list of the product names, their product codes and the final stock levels. The program should also display a re-order message for each product where the number in stock is less than two.

Displaying the Results

The output from the program should be in columns, similar to the examples shown below.

- The **initial stock list** should look something like this . . .

Product Name	Product Code	Initial Stock Level
Simpsun GN120	Sim120	1
Sonic Lux10	Sonx10	2
Ultimax G42	UltG42	4
Antalpha A200	Ant200	3
Nickov N230	Nic230	2

- The output of **finding a product** should look something like this . . .

Product to be found: UltG42

Product Name	Product Code	Stock Level
Ultimax G42	UltG42	4

- The output of **purchasing a product** should look something like this . . .

Product to be purchased: Sonx10

Product Name	Product Code	Status
Sonic Lux10	Sonx10	In stock
Purchase confirmed		

- The **final stock check** should look something like this . . .

Product Name	Product Code	Stock	Action
Simsun GN120	Sim120	1	Re-order
Sonic Lux10	Sonx10	1	Re-order
Ultimax G42	UltG42	4	
Antalpha A200	Ant200	3	
Nickov N230	Nic230	1	Re-order

Algorithm

1. Enter and store product names and initial stock levels
2. Calculate and store product codes
3. Display product names and codes
4. Start conditional loop
5. Display menu
6. Get option from user
7. Where option is F, perform Find a product
8. Where option is P, perform Purchase a product
9. Where option is Q, perform Quit
10. End conditional loop when Q is chosen
11. Display final stock check

What you have to do:

Tasks		Evidence required	Marks
1	Indicate data flow on the algorithm.	Algorithm with data flow.	3
2	Refine steps 2, 7 and 8 of the algorithm.	Pseudocode for steps 2, 7 and 8.	7
3	Using a software development environment of your choice, implement the algorithm. Use separate sub-programs where appropriate. Use parameter passing where appropriate.	Listing of implemented program.	16
4	Test the program with the data provided to ensure that it is fit for purpose.	Hard copy of test results.	1
5	Evaluate the test results.	Brief report on test results.	3

Part 2

Click-Kit needs to replace its desktop computers. Space is restricted in the office and so it is decided to purchase mini desktop computers. They already have ten energy efficient TFT monitors, keyboards and mice on their existing machines.

The company's Energy Use policy aims to minimise its carbon footprint and cut down on electricity bills by installing computers which use a minimum of electrical power. The ten new mini desktops must be energy efficient.

To reduce installation costs the mini desktops must be linked using a wireless connection. Click-Kit also needs a high speed tape backup system for the office file server. Data recovery software is needed on each of the ten computers.

The decision is taken to purchase:

- Ten mini desktop base units, each with the following specifications:
 - Suggested dimensions: 80 × 250 × 250 mm
 - Low power, consuming on average, less than 100 Watts
 - 1.5 GHz dual-core processor
 - Minimum of 1 Gigabyte RAM
 - Minimum of 100 Gigabytes of backing storage
 - A wireless network interface

- A high-speed tape drive with the following specifications:
 - A SCSI parallel interface
 - A buffer with a minimum capacity of 64 Megabytes
 - High speed transfer rate: minimum of 30 Mbps
 - Five tape cassettes, each with a minimum capacity of 400 Gigabytes

- A colour laser printer
 - Minimum 128 Megabytes of RAM
 - Minimum print resolution of 2400 × 600 dpi in black and white
 - Minimum print speed of 15 pages per minute in black and white
 - Network capability

- Licences for utility software for data recovery
 - The software package, or packages, should be capable of recovering files from a hard drive which have been lost because of a hard disk crash or accidental deletion
 - Either ten individual licenses or one site licence is needed

The total budget for all Click-Kit's purchases is set at £8500.

What you have to do:

Tasks		Evidence required	Marks
1	Produce a report which: <ul style="list-style-type: none"> Identifies two suitable mini desktops Compares the mini desktops in terms of processor speed, backing storage capacity, RAM capacity and power consumption Uses the above criteria to recommend one mini desktop and justifies the recommendation in terms of the context 	A report detailing your findings and recommendation Printouts/photocopies of source materials, eg web pages, magazine articles. Copy of report.	8
2	Produce a report which: <ul style="list-style-type: none"> Identifies two suitable tape drives Compares the tape drives in terms of buffer capacity, cartridge capacity and data transfer rate Uses the above criteria to recommend one tape drive and justifies the recommendation in terms of the context 	A report detailing your findings and recommendation Printouts/photocopies of source materials, eg web pages, magazine articles.	7
3	Produce a report which: <ul style="list-style-type: none"> Identifies two suitable networked colour laser printers Compares the networked colour laser printers in terms of RAM capacity, print resolution and print speed Uses the above criteria to recommend one networked laser printer and justifies the recommendation in terms of the context. 	A report detailing your findings and recommendation Printouts/photocopies of source materials, eg web pages, magazine articles.	7
4	Produce a report which: <ul style="list-style-type: none"> Identifies two suitable data recovery software packages Compares the data recovery software packages in terms of two suitable features Uses the above criteria to recommend one data recovery package and justifies the recommendation in terms of the context 	A report detailing your findings and recommendation Printouts/photocopies of source materials, eg web pages, magazine articles.	6
5	Produce a report which shows that the total expenditure for the purchases is within £8500	A report summarising costs.	2

Note: It is advisable to highlight the relevant sections of any printouts/photocopies of source materials.

Section 3

Marking Guidelines

Marking Grid

Name _____

Date _____

Topic		Out of	Mark	Comment
Part 1				
Design (10)	Indication of data flow	3, 2, 1, 0		
	Pseudocode for step 2	2, 1, 0		
	Pseudocode for step 7	2, 1, 0		
	Pseudocode for step 8	3, 2, 1, 0		
Implementation (16)	Main program	2, 1, 0		
	Sub-program for step 2	2, 1, 0		
	Sub-program for step 7	2, 1, 0		
	Sub-program for step 8	3, 2, 1, 0		
	Formatted output	2, 1, 0		
	Use of parameters	3, 2, 1, 0		
	Maintainability	2, 1, 0		
Correcting errors (4)	Testing	1, 0		
	Evaluating fitness for purpose	1, 0		
	Evaluating maintainability	2, 1, 0		
Part 2				
Identify and justify mini desktop (8)	Identify two suitable mini desktops	2, 1, 0		
	Compare mini desktops according to processor speed, backing storage capacity, RAM capacity, and power consumption	4, 3, 2, 1, 0		
	Recommend one mini desktop using the above criteria and justify the recommendation in terms of the context	2, 1, 0		
Identify and justify a tape backup drive (7)	Identify two suitable tape drives	2, 1, 0		
	Compare two tape drives in terms of buffer capacity, cartridge capacity and data transfer rate	3, 2, 1, 0		
	Recommend one tape drive using the above criteria and justify the recommendation in terms of the context	2, 1, 0		
Identify and justify a wireless colour laser (7)	Identify two suitable networked colour laser printers	2, 1, 0		
	Compare two networked colour laser printers in terms of RAM capacity, print resolution and print speed	3, 2, 1, 0		
	Recommend one laser printer using the above criteria and justify the recommendation in terms of the context	2, 1, 0		
Identify and justify data recovery software (6)	Identify two suitable data recovery software packages	2, 1, 0		
	Compare the recovery software packages in terms of two suitable features	2, 1, 0		
	Recommend one data recovery package using the above criteria and justify the recommendation in terms of the context	2, 1, 0		
Overall report (2)	The total cost of all recommended hardware is within the £8500 budget	1, 0		
	Completeness and clarity of report	1, 0		
Overall total		60		

Allocation of marks

Award full marks if achieved successfully without assistance.
 Award less than the maximum if task achieved **partially** without assistance.
 Award one mark if completed with **some** assistance or hints.
 Award no marks if item not achieved, or completed only with **significant** assistance.

Further Guidelines for Teachers/Lecturers

(Not to be distributed to candidates)

Part 1

It may be necessary, in some programming environments, to introduce a “step zero” into the algorithm to initialize the variables.

The supplied data can be input into the program in any suitable fashion ie typed in by the user, read from data statements or even a file. Pupils are not required to fully test for robustness.

Purchase an item: this part of the program should be tested by the user purchasing a **Sonic Lux10** and **Nickov N230** in order to produce the final stock check.

When evaluating maintainability candidates should consider the use of:

- white space – indentation and blank lines
- meaningful identifiers eg procedure, variable names
- internal commentary.

Two marks should be awarded if the evaluation refers to all three of the above bullet points. One mark should be awarded if the evaluation refers to two of the above. No marks should be awarded if the evaluation refers to fewer than two of the above. It can be assumed that the item names are a minimum of six characters long.

Part 2

Only the base units for the mini desktops are needed, Click-Kit already has ten adequate TFT monitors, keyboards and mice.

Suggested dimensions of mini desktops are for guideline only.

Data recovery software may be one package, a suite of packages or a combination of several distinct packages. A site licence may be the most economical solution.

Suggested suitable features for comparison of data recovery software are range of file types recoverable and the range of types of media from which data can be recovered.

The tape drive may be external or internal. If the latter, then compatibility can be assumed.

Section 4

Advice on Recording and Retention of Evidence

Advice on Recording and Retention of Evidence

For each candidate, the following evidence should be retained for possible verification by SQA:

- 1 written reports, program designs, program listings, printouts and other evidence as detailed in the Coursework Task
- 2 completed marking grid.

The summary form overleaf may be copied for each candidate undertaking the Higher Computing Course.

Candidate assessment summary

Name _____ Year of presentation _____

Centre _____ Candidate number _____

Unit assessment

Unit title	Software Development		Date passed	Initials
	Mark			
	1 st attempt	2 nd attempt		
Assessment 1 (Outcome 1)				
Assessment 2 (Outcome 2)				

Unit title	Computer Systems		Date passed	Initials
	Mark			
	1 st attempt	2 nd attempt		
Assessment 1 (Outcome 1)				
Assessment 2 (Outcome 2)				

Unit title			Date passed	Initials
	Mark			
	1 st attempt	2 nd attempt		
Assessment 1 (Outcome 1)				
Assessment 2 (Outcome 2)				

Course assessment

	Mark	Date completed	Initials
Coursework Task (out of 60)			
Estimate examination mark (out of 140)			
Total (out of 200)		Teacher/Lecturer signature	
Estimate grade			