

**Coursework Task
C206 12**

Higher Computing

Valid for session 2010/2011 only

Coursework Task

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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 2010–2011

Part 1

Extremegraph sells high performance graphics cards and computer games online. It wants to develop software that will generate customer codes and let these customers query the details of the graphics cards stored on the system.

How the program should work

The program should:

Initialise the graphics card test data by a suitable method

Generate and display a customer code:

- ask for the forename and surname of the customer
- create the code for the customers by:
 - extracting the first letter of each name and add these to the code
 - adding a random number between 0 and 9
 - adding a random lower case character (a to z)
- display the generated customer code

Answer a number of queries until the customer chooses to exit

- display options and get a choice from the user
- if the choice is 1, ask the customer for a minimum clock speed and display the number of cards that exceed this speed
- if the choice is 2, find and display the name of the graphics card with the highest processor clock speed
- if the choice is 3, ask the customer for a minimum size of RAM and a maximum cost, then display the details of all cards that match these requirements
- if the choice is 4, exit the query session

Display a suitable closing message using the customer name and code

Test Data

Note: you may enter test data using any method that suits your programming environment.

Initial Data for the graphics cards:

Name	RAM Capacity in Gigabytes	Clock Speed in MHz	Cost in £
RadeonX2	1	1986	187
GeForce95	1	550	41
VaporX	2	870	150
AsusOX2	2	790	354
Nvidia42X	3	1600	575

Test using the customer name:

Erin McKenzie

Test the following queries:

- number of graphics cards with a minimum clock speed of **800** Megahertz (MHz)
- name of the card with the highest clock speed
- list the cards with a minimum of **2** Gigabytes of RAM and maximum cost of **£400**

Output

The Output from your program should look something like this:

Erin McKenzie your order code is EM5f

Customer options are:

- 1 to find how many are fast enough
- 2 to know which is the fastest
- 3 to see which is large enough but still affordable
- 4 to end the session

Please enter your choice . . .

There are 3 cards with clock speeds greater than 800 MHz.

The card with the highest clock speed is the RadeonX2.

The cards matching your search are:

Name	RAM Capacity	Clock Speed	Cost in £
VaporX	2	870	150
AsusOX2	2	790	354

Goodbye Erin and thank you for using Extremegraph.

Remember to quote your customer code (EM5f) in any correspondence.

Main Algorithm

1. Input graphics card data
2. Generate customer code
3. Start conditional loop
4. Display options and get user choice
5. If choice is 1, display number of cards faster than a specified clock speed
6. If choice is 2, display the name of the graphics card with the highest clock speed
7. If choice is 3, display the details of cards that match user requirements
8. End the loop when choice is 4
9. Display the closing message
10. End program

What you have to do:

Tasks		Evidence required	Marks
1	Indicate data flow on the main algorithm.	Algorithm with data flow.	3
2	Refine steps 2, 5 and 6 of the algorithm.	Pseudocode for steps 2, 5 and 6.	7
3	Using a software development environment of your choice, implement the algorithm. Use separate sub-programs where appropriate. Use parameter passing where appropriate.	Structured listing of implemented program.	16
4	Test the program with the data provided to ensure that it is robust and fit for purpose.	Hard copy of test results.	1
5	Evaluate the test results in terms of fitness for purpose, robustness and maintainability.	Brief report on test results.	3

Part 2

The Extremegraph office manager decides to replace her computer with a new all-in-one touch screen computer, complete with one of the latest 64 bit operating systems. She decides she needs an external Blu-ray writer to store the high definition video clips which she uses to promote sales of computer games. Since she uses lots of secure passwords, which are difficult to remember, she decides she needs password protection software. She also needs a robust external hard drive to take data to meetings with suppliers.

She decides to purchase:

- An all-in-one computer with a 64-bit processor, a minimum of 2 Gigabytes of RAM, a touch screen, and a 64-bit operating system
- An external Blu-ray writer with a minimum write speed of 4X
- An external solid-state hard drive with a minimum of 128 Gigabytes capacity
- Password protection software

The total budget is set at £2000.

Tasks		Evidence required	Marks
1	Produce a report in which you: <ul style="list-style-type: none"> • identify two suitable all-in-one computers • compare the two systems in terms of RAM capacity, clock speed and cost • recommend one all-in-one computer • justify your recommendation in terms of the context 	A report detailing your findings and recommendation. Printouts/photocopies of source materials eg web pages, magazine articles.	7
2	Produce a report in which you: <ul style="list-style-type: none"> • identify two suitable external Blu-ray writers • compare the writers in terms of Blu-ray DVD write speed, type of interface and cost • recommend one external Blu-ray writer • justify your 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 in which you: <ul style="list-style-type: none"> • identify two portable external solid state drives (SSD) • compare the two drives in terms of capacity, type of interface and cost • recommend one portable external SSD • justify your 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 in which you: <ul style="list-style-type: none"> • identify two suitable password protection software packages • compare the two packages in terms of the number of bits used for encryption, cost and one other relevant feature • recommend one software package • justify your recommendation in terms of the context 	A report detailing your findings and recommendation. Printouts/photocopies of source materials, eg web pages, magazine articles.	7
5	Produce a report which shows that the total expenditure for the purchases is within £2000	A report summarising costs.	2

Note: Relevant sections of all photocopies/printouts of source materials should be highlighted.

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 5	2, 1, 0		
	Pseudocode for step 6	3, 2, 1, 0		
Implementation (16)	Main program	2, 1, 0		
	Sub-program for step 2	2, 1, 0		
	Sub-program for step 5	2, 1, 0		
	Sub-program for step 6	2, 1, 0		
	Sub-program for step 7, including formatting	3, 2, 1, 0		
	Use of parameters	3, 2, 1, 0		
	Maintainability	2, 1, 0		
Testing and Evaluation (4)	Testing	1, 0		
	Evaluating fitness for purpose, robustness and maintainability.	3, 2, 1, 0		
Part 2				
Identify and justify all-in-one computer (7)	Identify two suitable computers	1, 0		
	Compare the systems according to RAM capacity, clock speed and cost	3, 2, 1, 0		
	Justify a recommendation in terms of the context	3, 2, 1, 0		
Identify and justify an external Blu-ray writer (7)	Identify two external Blu-ray writers	1, 0		
	Compare two external Blu-ray writers in terms of Blu-ray DVD write speed, type of interface and cost	3, 2, 1, 0		
	Justify a recommendation in terms of the context	3, 2, 1, 0		
Identify and justify a portable external solid state drive (7)	Identify two portable external solid state drives	1, 0		
	Compare the portable external solid state drives in terms of capacity, type of interface and cost	3, 2, 1, 0		
	Justify a recommendation in terms of the context	3, 2, 1, 0		
Identify and justify a password protection software package (7)	Identify two password protection software packages	1, 0		
	Compare two password protection software packages in terms of the number of bits used for encryption, cost and one other feature	3, 2, 1, 0		
	Justify a recommendation in terms of the context	3, 2, 1, 0		
Overall report (2)	The total cost of all recommended hardware is within budget	1, 0		
	Completeness and clarity of report	1, 0		
Overall total		60		

Allocation of marks

Where marks are allocated as 3,2,1,0:

3=full answer achieved successfully without assistance

2=achieved successfully without assistance

1=achieved partially without assistance, or completed with some assistance or hints

0=not achieved, or completed only with significant assistance

Further Guidelines for Teachers/Lecturers

(Not to be distributed to candidates)

Part 1

Candidates may enter the graphics card data using keyboard entry, read...data statements, read from file or any other method that suits their programming environment.

To be awarded the marks for data flow it is necessary for candidates to display the data flow in their top-level design (main algorithm).

For the implementation of step two, candidates may find it easier to use a standard function in their language of choice to convert from their random number to an ASCII character, rather than create their own using a CASE (or equivalent) command.

Steps 5 and 6 are straightforward implementations of counting occurrences and linear search.

Step 7 carries one mark for the array traversal, one mark for the complex condition and one mark for the correctly formatted output table.

The test data for the program is provided and must be used, although additional examples of testing may be included.

An example of the expected output is given. The wording is not intended as proscriptive in any way and alternative wording is acceptable.

To gain both marks for maintainability candidates must have **all** of the following features in their program: meaningful internal commentary, meaningful identifies, effective use of white space and a modular structure. One mark should be awarded for the inclusion of any **two** from the list.

Part 2

It is important that candidates highlight the key points in any printouts/photocopies of web pages or magazine articles they submit as source material for their Coursework.

If source material **does not** have key points highlighted then the report **cannot** be awarded full marks for completeness and clarity.

Prices for purchases should be reasonably current ie post October 2009.

For Blu-ray disks, 1x speed is defined as 36 megabits per second (Mbps)

Suitable all-in-one computers must be capable of supporting 64 bit operating systems eg Windows 7, Linux, Apple Snow Leopard.

An “all-in-one computer” can be taken to include laptops and other devices with integral monitor, keyboard etc.

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

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

Unit title			
	Mark		Date passed
	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			