

GCSE Computer Science

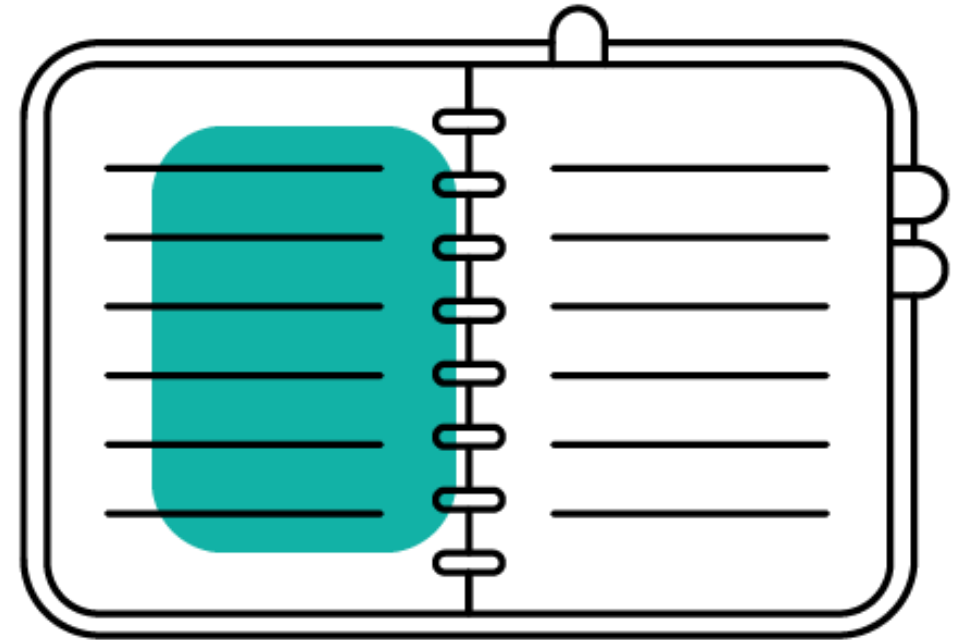
Exam Insights May/June 2024
Components 1 and 2



Agenda

In this session we are going to look at:

- overall performance of 2024 components
- grade boundaries and statistics
- deep dive on Paper 1
- deep dive on Paper 2
- support and resources



Qualification breakdown

Paper 1: Principles of Computer Science (*Paper code: 1CP2/01)

Written examination: 1 hour and 30 minutes

50% of the qualification

75 marks

Content overview

This paper will assess Topics 1 to 5.

Paper 2: Application of Computational Thinking (*Paper code: 1CP2/02)

Onscreen examination: 2 hours

50% of the qualification

75 marks

Content overview

This paper will assess Topic 6: Problem solving with programming.

Assessment Objectives



Pearson
Edexcel

Assessment Objectives

Students must:		% in GCSE
A01	Demonstrate knowledge and understanding of the key concepts and principles of computer science	30
A02	Apply knowledge and understanding of key concepts and principles of computer science	40
A03	Analyse problems in computational terms: <ul style="list-style-type: none">• to make reasoned judgements• to design, program, evaluate and refine solutions.	30
Total		100

Breakdown by paper

Paper	Assessment Objectives			Total % for all Assessment Objectives
	AO1 %	AO2 %	AO3 %	
Paper 1: Principles of Computer Science	30	20	0	50
Paper 2: Application of Computational Thinking	0	20	30	50
Total for GCSE	30	40	30	100

Summer 2024 statistics

Cumulative percentages

Provisional Grade Statistics are available [here](#).

Total	9	8	7	6	5	4	3	2	1	U
8691	9.6	18.2	28.8	42.3	56.5	68.9	79.5	88.7	96.4	100.0

- 8691 students took the qualification exams
- 68.9% of students were awarded a grade 4 or above
- 28.8% of students were awarded a grade 7 or above

Grade boundaries

Grade boundaries are available [here](#).

Max mark	9	8	7	6	5	4	3	2	1	U
150	119	105	91	76	61	47	34	21	8	0

- The raw scores from the two papers were well aligned with very similar notional boundaries

Computer Science														
Notional component grade boundaries				Max Mark	9	8	7	6	5	4	3	2	1	U
1CP2	Computer Science	Raw	75	60	53	46	38	31	24	17	10	4	0	
	Paper 01													
1CP2	Computer Science	Raw	75	59	52	45	37	30	23	16	10	4	0	
	Paper 02													

- Examiners did see full marks on some Paper 1 submissions
- Examiners did see full marks on some Paper 2 submissions

2024 Published materials

June 2024 published materials are available [here](#) (you will need a login).


Exam materials (28)

SORT BY

Exam Series

EXPAND ALL


June 2024 **NEW**


 **PDF**

Mark scheme - Paper 1 - June 2024

Paper 1 - Principles of Computer Science

| PDF 391.6 KB | 16 July 2024


NEW



 **PDF**

Mark scheme - Paper 2 - June 2024

Paper 2 - Application of Computational Thinking

| PDF 2.8 MB | 16 July 2024


NEW



 **PDF**

Question paper - Paper 1 - June 2024

Paper 1 - Principles of Computer Science

| PDF 852.4 KB | 02 July 2024





 **PDF**

Question paper - Paper 2 - June 2024

Paper 2 - Application of Computational Thinking


| PDF 309.5 KB | 02 July 2024




 **ZIP**

Data Files - June 2024 - 1CP2 02


| ZIP 118.3 KB | 21 May 2024



 **PDF**

1CP2 02 Programming Language Subset (PLS) - Summary of Changes 2024

| PDF 90.1 KB | 08 December 2023

 **PDF**

1CP2 02 Programming Language Subset (PLS) Version 5 - Summer 2024

| PDF 275.3 KB | 08 December 2023

Deep dive on Paper 1

Paper 1 – Principal examiner's report

- The paper requires students to demonstrate and apply knowledge and understanding of the key principles and concepts outlined in the specification content.
- This is an un-tiered paper.
- The paper consists of five questions. Each question focuses on a different specification topic.
- 'Command words' are used consistently in the paper to indicate the type of response expected.
- Detailed responses, including examples and reasons, where provided allowed students to better express their understanding.
- Using subject-specific language and avoiding generic responses also helped students to better express their understanding.

1b

Readability is the first mark and teamwork is the second mark.

(b) State **two benefits** of subprograms.

(2)

- 1 It makes it easier to understand code as it improves readability
- 2 It allows larger groups of people to work together because they can share subprogram functions

2 marks

Both responses were unqualified points.

(b) State **two benefits** of subprograms.

(2)

- 1 easier to break down.
- 2 easier to code.

0 marks

1c(iii)

16-19 correctly identified the relevant lines of code.

(iii) Give the line numbers of a selection.

(1)

16 - 19

1 mark

The starting line 16 was insufficient and the range of lines was required.

(iii) Give the line numbers of a selection.

(1)

16

0 marks

1d(i)

The mark was awarded for identifying that the rules of the language had been broken.

(d) Programs can have syntax errors and runtime errors.

(i) Define the term 'syntax error'.

(1)

an error that occurs when the rules
of the programming language are broken

1 mark

No mark was awarded when a response could have applied to a number of different types of errors.

(d) Programs can have syntax errors and runtime errors.

(i) Define the term 'syntax error'.

(1)

A mistake in the code stops the program from
running

0 marks

1d(ii)

The first mark was awarded for an instruction that can't be executed, and the second for 'crashing' the program.

One mark was awarded for 'crashing' the program but there was no expansion.

(ii) Runtime errors happen when a program is executing.

Explain a runtime error.

(2)

When a program is asked to run something that is not possible such as division by zero. This stops the program from running.

2 marks

(ii) Runtime errors happen when a program is executing.

Explain a runtime error.

(2)

→ Runtime error occurs while the program is running
→ The program may crash while running

1 mark

1e(i)

One mark for
True and one
mark for False.

(e) Algorithms use relational and arithmetic operators.

(i) Here is a relational operator used in a conditional test.

```
count > index
```

~~*~~ State the **two** different results of evaluating a conditional test.

(2)

- 1 true - when count is larger than index for example
- 2 false - when count is less than or equal to index.

2 marks

(e) Algorithms use relational and arithmetic operators.

(i) Here is a relational operator used in a conditional test.

```
count > index
```

State the **two** different results of evaluating a conditional test.

(2)

- 1 Yes
- 2 No

No marks for
values that were
not Boolean.

0 marks

1f(i)

(f) Programmers consider algorithm efficiency when they write code.

(i) Sorting and searching use algorithms.

Complete the table with the name of a search algorithm and a sort algorithm.

(2)

One mark for
Binary Search
and one mark
for Bubble Sort.

Algorithm type	Characteristic	Algorithm name
Search	Is a divide and conquer algorithm	Binary Search
Sort	Is not a divide and conquer algorithm	Bubble Sort

2 marks

1f(ii)

One mark for more comparisons and the second for takes longer.

(ii) Explain **one** effect the number of comparisons has on the execution time of a sorting algorithm.

(2)

The higher the number of comparisons, the longer the time it takes for the sorting algorithm to complete because there're more comparisons to sort.

2 marks

(ii) Explain **one** effect the number of comparisons has on the execution time of a sorting algorithm.

(2)

it take a long time to execute

This response did not qualify what would take a long time.

0 marks

2b

One mark for
'time between
samples'

(b) Sound waves are converted to binary using sample intervals.

Define the term 'sample interval'.

(1)

The time taken between samples

1 mark

(b) Sound waves are converted to binary using sample intervals.

Define the term 'sample interval'.

(1)

Sample ~~interval~~ interval is the number of samples
of sound waves that are taken in a set amount of time.

0 marks

No mark for
defining sampling
frequency instead
of sampling
interval.

2c

One mark for width times height and one for pixels as the unit

- (c) Give an expression to calculate the size of a bitmap image, not the size of the file that stores the image.

(2)

width x height (in pixels)

2 marks

- (c) Give an expression to calculate the size of a bitmap image, not the size of the file that stores the image.

(2)

height x width x bit depth

One mark for height times width.

1 mark

2d(i)

(d) Computers manipulate binary patterns.

(i) Complete the table with the result of applying the shift to the binary pattern.

(2)

Binary pattern	Shift	8-bit binary result
1010 0011 0001 0100	Logical shift left by 3	0 0 0 1 1 0 0 0
1110 0111 1111 0010	Arithmetic shift right by 2	1 1 1 1 0 0 1 0

One mark for
0001 1000
and one mark
for 1111 0010

2 marks

2d(iii)

One mark for
the first nibble
0111 and one
mark for the
second nibble
0000

(iii) Convert the denary value +112 to 8-bit binary representation.

(2)

128 64 32 16 8 4 2 1
0 1 1 1 0 0 0 0

2 marks

One mark for
the first nibble
0111

(iii) Convert the denary value +112 to 8-bit binary representation.

128	64	32	16	8	4	2	1
0	1	1	1	0	1	0	0

112 - 64 = 48
48 - 32 = 16
16 - 16 = 0

01110100

1 mark

2d(iv)

One mark for
the first nibble
1011 and one
mark for the
second nibble
0111

One mark for
the first nibble
1011

(iv) Give the 8-bit binary two's complement representation of denary -73

(2)

1011 0111

2 marks

(iv) Give the 8-bit binary two's complement representation of denary -73

(2)

128	64	32	16	8	4	2	1
0	1	0	0	1	0	0	1

$\begin{array}{r} 64 \\ - 73 \\ \hline 07 \end{array}$

1011 0110

1 mark

2e(ii)

One mark for 2^8

(ii) The address bus of a computer is 8-bits wide.

State the number of unique addresses that can be accessed.

(1)

2^8

1 mark

(ii) The address bus of a computer is 8-bits wide.

State the number of unique addresses that can be accessed.

(1)

255

No mark for a response that is off by one.

0 marks

2f

One mark for 2^{40}
which is
equivalent to
sight of 1024^4
and one mark
for dividing the
number of bytes
by this.

(f) Construct an expression to convert 40 681 930 227 712 bytes to tebibytes.

(2)

bytes		
kibi	$\times 2^{10}$	
mebi	$\times 2^{20}$	
gibi	$\times 2^{30}$	
tebi	$\times 2^{40}$	

$$\frac{40681\ 930\ 227\ 712}{2^{40}}$$

2 marks

One mark for
sight of 1024^4

b(f) Construct an expression to convert 40 681 930 227 712 bytes to tebibytes.

(2)

B	$\left. \begin{array}{l} \times 1024 \\ \times 1024 \\ \times 1024 \\ \times 1024 \end{array} \right\}$	
K		
M		
G		
T		

$$\frac{40681\ 930\ 227\ 712 \times 1024^4}{1024^4}$$

1 mark

3a(i)

One mark for
Local Area
Network

3 Networks

(a) Networks are described in many different ways.

(i) Give the type of network that covers a small geographical area.

(1)

Local area network (LAN)

1 mark

No mark for an
inaccurate
technical term

3 Networks

(a) Networks are described in many different ways.

(i) Give the type of network that covers a small geographical area.

(1)

~~LAN~~ SAM - small area network

0 marks

3a(ii)

One mark for
sight of range

(ii) Name the characteristic of a wireless network that is measured in metres.

(1)

Only has a range of 100m

1 mark

No mark for an
incorrect
property

(ii) Name the characteristic of a wireless network that is measured in metres.

(1)

Bandwidth

0 marks

3a(iii)

One mark for
damage to
backbone and
one for
removal /
damage to
terminators

One mark for
damage to
backbone

(iii) Give **two disadvantages** of a bus network topology.

(2)

1. If the main cable is damaged or fails then the whole network goes down.
2. If a terminator is removed then the whole network fails and stops working.

2 marks

(iii) Give **two disadvantages** of a bus network topology.

(2)

1. If the central cable fails, the whole network will fail.
2. If, at least, one node fails the whole network will fail.

1 mark

3b

One mark for giving permission / hiring and one mark for identifying vulnerabilities

One mark for finding vulnerabilities

(b) Describe penetration testing.

(2)

Penetration testing is a way for companies to test their network security, by hiring someone to hack into their system/network to find flaws ~~on~~ so the company can patch them up and make it secure.

2 marks

(b) Describe penetration testing.

(2)

Testing your ~~network~~^{system} or someone else's in order to find weaknesses and to improve based upon them

1 mark

3c(i)

One mark for
WiFi

(c) Network protocols control the rules of communication.

- (i) Name a network protocol that transmissions from other electrical devices can interfere with and that can be blocked by walls.

(1)

wifi

1 mark

No mark for
not giving a
protocol

(c) Network protocols control the rules of communication.

- (i) Name a network protocol that transmissions from other electrical devices can interfere with and that can be blocked by walls.

(1)

hotspot

0 marks

3c(ii)

One mark for
File Transfer
Protocol

(ii) Name the network protocol used to download a music file from a server.

(1)

FTP File Transfer Protocol

1 mark

No mark for a
file type rather
than a protocol

(ii) Name the network protocol used to download a music file from a server.

(1)

MP3

0 marks

3d

One mark for
WiFi and one
mark for
conversion to
radio signals

(d) Describe how the link layer of the TCP/IP protocol stack works.

(2)

The link layer uses either wifi or ethernet
to convert the data packets to radio
signals ^{so} it could be sent across the
channel to the ~~computer~~ next computer and
here the next computer receives the ~~data~~
~~packet~~ signals through the link layer and converts
it back into

2 marks

(d) Describe how the link layer of the TCP/IP protocol stack works.

(2)

No marks for
describing a
different layer
of the TCP/IP
stack

the IP assigns every node an IP address. TCP
helps transfer any data to any node in the same
network. Links computers with different IP addresses
in the same network together. Help them connect to the
internet. Then goes to the next layer.

0 marks

3e

1024x1024x1024
given as equivalent
to 1024^3 and dividing
by 1000 twice given
as equivalent to
dividing by 1000^2

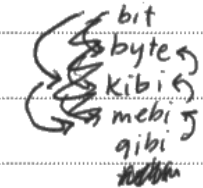
One mark for
numerator and one
mark for
denominator.

- (e) Construct an expression to calculate the transmission rate, in megabits per second, required to transmit a 1.4 gibibyte file in 13 minutes.

You do not need to do the calculation.

13 mins to secs is 13×60 ← bits not bytes? (4)

$\frac{\text{megabits}}{\text{seconds}} = \text{value}$

$$\frac{(1.4 \times 1024 \times 1024 \times 1024 \times 8) \div 1000}{13 \times 60} \div 1000$$


4 marks

- (e) Construct an expression to calculate the transmission rate, in megabits per second, required to transmit a 1.4 gibibyte file in 13 minutes.

You do not need to do the calculation.

time = file size \div transmission speed (4)

transmission rate = file size / time

$$\text{transmission rate} = \frac{1.4 \times 1024^3 \times 8}{13 \times 60}$$

2 marks

4a

One mark for translating all lines at once and one mark for giving error messages at the end of translation

One mark for translating all lines at once

4 Computers

- (a) A compiler translates source code to machine code. If the source code is edited, it must be recompiled.

Give **two other** characteristics of a compiler.

(2)

- 1 it translates the source code all at once rather than line by line
- 2 ~~it~~ it gives error messages at the end of the process rather than when it compiles them

2 marks

4 Computers

- (a) A compiler translates source code to machine code. If the source code is edited, it must be recompiled.

Give **two other** characteristics of a compiler.

(2)

- 1 It translates code all at once from high-level language into machine code
- 2 It creates an executable file once compiled

1 mark

4b

One mark for root node and one mark for hierarchical structure

No marks for how the structure is displayed rather than how it is organised

(b) Describe how an operating system organises files and folders.

(2)

In file management files are structured using hierarchical tree structure starting with the root directory at the start which requires special administration privileges. From the root directory it forms directory structures to folders to files. Files are stored on hard disk drive where there are free sectors.

2 marks

(b) Describe how an operating system organises files and folders.

(2)

File management is part of the operating system and it organises files in a specific order, for example, alphabetically.

0 marks

4c

One mark for recording changes and one mark for being able to roll back

One mark for recording who/when code was accessed as an audit

(c) Explain **one** way an audit trail helps programmers create robust software.

(2)

Audit trails record every change made so if an updated version of a program doesn't work you can use an audit trail to restore it to what it was before and compare the changes in the code to figure out how the error was caused.

2 marks

(c) Explain **one** way an audit trail helps programmers create robust software.

(2)

It keeps back of who accessed the software and when they accessed it

1 mark

4d

(d) Parking at an airport is controlled by computers.

No paper tickets are issued.

Here is an image of the control system at the exit.

The control system uses sensors, a camera and a database.

The barrier lifts if the parking fee has been paid.

Describe what the system does when the exit sensor is activated by a car driving towards it.

(2)

One mark for the camera being used to scan the licence plate

The camera switches on and scans the license plate. It then does a check with the payment system to see if the owner has paid. If paid, the barrier opens.

1 mark

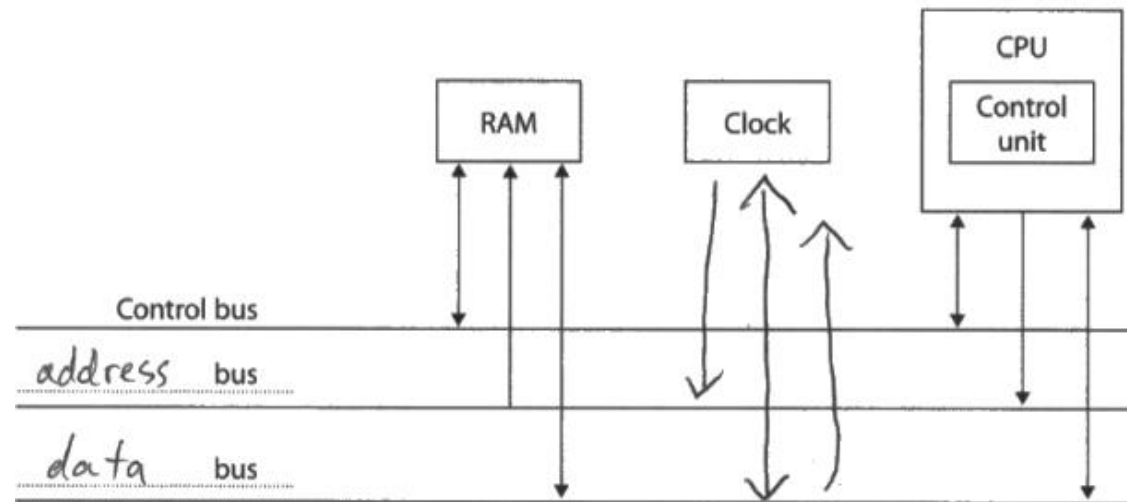
4e

(e) The components of a computer carry out the fetch-decode-execute cycle.

Complete the diagram with:

- the names of **two** buses
- a directional connection from the clock to the correct component.

(3)



One mark for
address bus and
one mark for data
bus

2 marks

4f

Three marks for a Level 2 response identifying which type of language was most suitable to which application with some justification

(f) A company is developing a new smartphone.

The smartphone has built-in devices, including a camera and a sound recorder.

The smartphone has applications, including one to edit pictures, one to translate speech to a text file and one for email.

Discuss the characteristics of high-level and low-level programming languages that make them suitable for developing software for the smartphone.

You should consider:

- the built-in devices
- the applications.

(6)

Low-level languages, such as assembly, are written in pneumatics, and are most useful for developing programs that act directly with parts of the hardware. Therefore, for the built-in devices, using low level languages would be best, as they can more easily fit the needs of specific hardware.

High-level languages, such as Java or C++, are written in English-like syntax, making them useful for easier to program and read. They are best used in applications that directly work within an OS, and so do not need to be hardware specific. Therefore, for the applications, high-level languages would be best.

3 marks

5a

One mark for longer cycles means less landfill and one mark for less biohazard as a result of this

No mark for not specifying what type of resources are used or what 'eco-friendly' actually means in practical terms

5 Issues and impact

- (a) A replacement cycle is the time between the purchase of a device and the purchase of its replacement.

Describe **one** impact the length of replacement cycles has on the environment.

If the length of the replacement cycle is longer, then less waste will be produced as the devices that are replaced are usually put in landfill as they may be a biohazard due to its battery. ⁽²⁾

2 mark

5 Issues and impact

- (a) A replacement cycle is the time between the purchase of a device and the purchase of its replacement.

Describe **one** impact the length of replacement cycles has on the environment.

The longer the replacement cycle, the less resources are being used up so it is more eco-friendly. ⁽²⁾

0 marks

5b

One mark for
patent and one
mark for trademark

(b) Intellectual property is protected by different methods.

Complete the table with the method of protection for **each** type of intellectual property.

(2)

Intellectual property	Method of protection
A hardware invention	← patent
An advertising slogan	Trademark

2 marks

5c

One mark for
sensors detecting
obstacles and one
mark for performing
a stopping action

One mark for
sensors detecting
obstacles

(c) Robots use sensors to collect data about their surroundings in order to carry out actions independently.

Explain **one** way that a modern car is a robot.

(2)

Modern

Cars have sensors on the front and back to aid
^
reversing. They can also detect humans and children
based off height. This detection of a human or child
will make the car carry out an emergency stop.

2 marks

(c) Robots use sensors to collect data about their surroundings in order to carry out actions independently.

Explain **one** way that a modern car is a robot.

(2)

It uses sensors to sense objects close to hitting
the car, sensors to detect speed, sensors to detect
temperature.

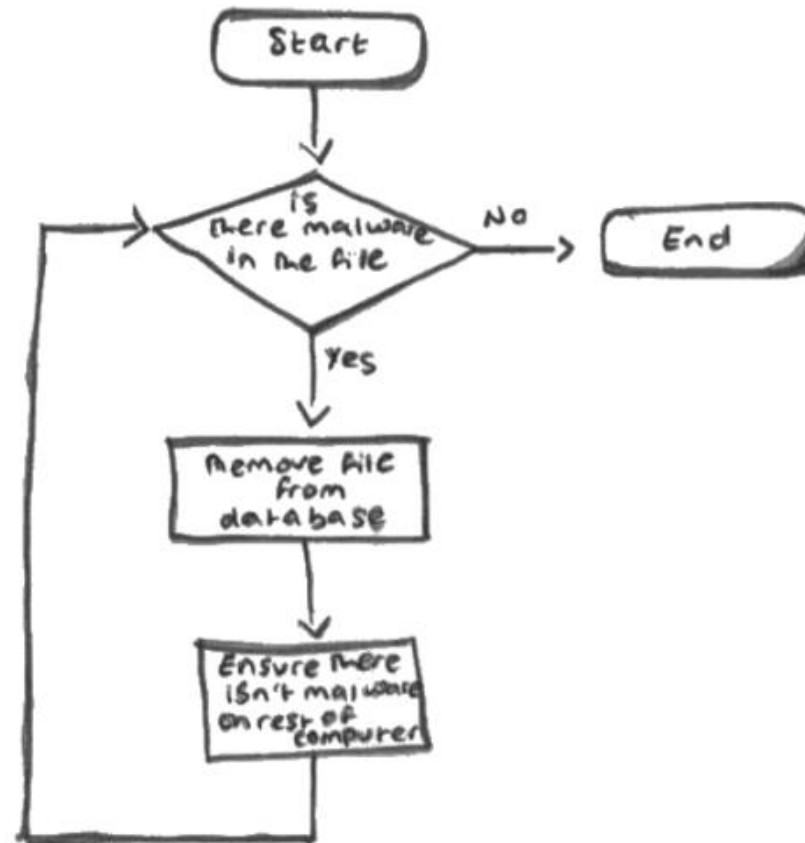
1 mark

5d

Four marks for deciding if a virus is present, performing an action if it is, or no action if not, and connecting a flowchart correctly using valid symbols

(d) Anti-malware protects systems from viruses.

Draw a flowchart in the box provided to show how anti-malware detects a virus in a file and what it does with the file.



4 marks

Take away

Students should:

- attempt to answer every question
- read the stem carefully to identify the context and make the response fit the context
- provide enough information for two-mark questions, where a linked response is often required
- expand and explain responses by giving examples
- use subject-specific terminology in responses.

Deep dive on Paper 2

Paper 2 – Principal examiner's report

- This is the third examination of the Edexcel GCSE Computer Science (9-1), with the paper two onscreen exam. The programming language required is Python 3.
- Students are supplied with a question paper, a programming language subset document, and a code file for each question.
- Students are required to amend the code files and save their work, using a different file name.
- Centres compress the code file responses for each student. The compressed files are uploaded to Edexcel for external assessment, via the Learner Work Transfer platform.
- The majority of centres supplied a single zipped file of the COMPLETED_CODE folder for each student. The submissions were correctly identified with the centre and student number.

Q01

This response did amend the code to fix many of the issues, but it erroneously set wavelength to a string rather than an integer value in line 8, did not change the spelling of color to colour in line 21, and did not correct line 37 to the correct index for output.

```
1 # -----
2 # Global variables
3 # -----
4 rainbow = ["Violet", "Indigo", "Blue", "Green", "Yellow", "Orange", "Red"]
5 waveTable = [380, 425, 450, 492, 577, 597, 622]
6 found = False
7 index = 0
8 wavelength = "0123"
9 colour = ""
10
11 # -----
12 # Main program
13 # -----
14 # User chooses a colour index
15 index = int(input("Enter an index: "))
16 if (index < 0):
17     print("Indexes cannot be zero")
18 elif (index > 6):
19     print("Indexes cannot be more than six")
20 else:
21     color = rainbow[index]
22     print(str(colour))
23
24 # User chooses a colour based on wavelength
25 wavelength = int(input("Enter a wavelength "))
26 if ((wavelength < 380) or (wavelength > 622)):
27     print("Invalid wavelength")
28 else:
29     index = 0
30     # Look for a wavelength less than or equal to user's choice
31     while (not found):
32         if (wavelength == waveTable[index]):
33             found = True
34             print(rainbow[index])
35         elif (waveTable[index] >= wavelength):
36             found = True
37             print(rainbow[index])
38         else:
39             index = index + 1
```

7 marks

Q02

In this response
two errors were
made.

The operator `>=` was used in line 33 instead of `>` in line 32.

The chr() function was used in line 69 instead of the ord() function in line 68.

8 marks

```

1 # -----
2 # Global variables
3 # -----
4 plainText = ""
5 cipherText = ""
6 shift = 0
7
8 # -----
9 # Main program
10 # -----
11 plainText = input ("Enter the plain text: ")
12 shift = int (input ("Enter the shift value: "))
13
14 for letter in plainText:
15     # =====> Choose the correct line to
16     #if (letter.isalpha()):
17     #if (letter.islower()):
18     #if (letter.isupper()):
19     if (letter.isalpha()):
20         # =====> Choose the correct line to
21         #elif (letter.lower()):
22         elif (letter.islower()):
23         #elif (letter.isupper()):
24         #elif (letter.isalpha()):
25         # =====> Choose the correct line to
26         #if (letter.islower()):
27         #if (letter.isupper()):
28         #if (letter.isalpha()):
29         if (letter.islower()):
30             # =====> Choose the correct line to
31             #if (value >= ord ('z')):
32             #if (value < ord ('z')):
33             if (value > ord ('z')):
34                 # =====> Choose the correct line to
35                 #cipherText = newLetter + cipherText
36                 newLetter = cipherText + newLetter
37                 cipherText = cipherText + newLetter
38             else:
39                 # =====> Choose the correct line to
40                 #cipherText = letter + cipherText
41                 cipherText = cipherText + letter
42                 #letter = cipherText + letter
43                 #letter = letter + cipherText
44             newLetter = ord (va
45             newLetter = chr (va
46             newLetter = ord (let
47             newLetter = chr (le
48
49 print ("Plain text: ", plainText)
50 print ("Cipher text: ", cipherText)

```

Q03

This response used the wrong logical operator in line 26 and the wrong constant in line 30.

This meant that when tested the code did not pass all test conditions.

7 marks

```
1 # -----
2 # Constants
3 # -----
4 PURCHASE_TYPE_ITEM = 1
5 PURCHASE_TYPE_WEIGHT = 5
6
7 PRICE_PER_KILOGRAM = 3.45
8 PRICE_PER_ITEM = 1.23
9
10 # -----
11 # Global variables
12 # -----
13 weight = 0.0
14 count = 0
15 totalCost = 0.0
16
17 # =====> Create an integer variable named purchaseType and set it to 0
18 purchaseType = 0
19
20 # -----
21 # Main program
22 # -----
23 purchaseType = int(input("Enter a purchase type (1 or 5) "))
24
25 # =====> Complete the line with the correct logical operator and the correct constant
26 if ((purchaseType != PURCHASE_TYPE_ITEM) or (purchaseType != PURCHASE_TYPE_WEIGHT)):
27     print("Invalid purchase type")
```

```
50 # =====> Add a line to display an informative message and the total cost
51 print("Your total cost is £", totalCost)
```

Q04

This solution did not add any additional comments for MP9 and did not use a library function (`math.ceil()`) to round up values to the nearest integer, so did not achieve MP12.

Test outputs did not produce all the intended outcomes, so the functionality mark was limited to 2 marks out of 3.

12 marks

```
1 # -----
2 # Import libraries
3 # -----
4 import math
5
6 # -----
7 # Constants
8 # -----
9 CHEESE_PER_ADULT = 40      # Grams
10 CHEESE_PER_CHILD = 30     # Grams
11 MIN_CHEESE = 500          # 500 grams in a pack
12
13 ROLLS_PER_ADULT = 1.5     # Count
14 ROLLS_PER_CHILD = 0.5     # Count
15 MIN_ROLLS = 24            # Count of rolls in a pack
16
17 CRISPS_PER_ADULT = 0.75   # Of a bag
18 CRISPS_PER_CHILD = 0.25   # Of a bag
19
20 # -----
21 # Global variables
22 # -----
23
24 # =====> Write your code here
25 numAdults = 0
26 numChilds = 0
27
28 # -----
29 # Main program
30 # -----
31
32 # =====> Write your code here
33 numAdults = int(input("Number of adults: "))
34 numChilds = int(input("Number of children: "))
35
36 partialBags = (CRISPS_PER_CHILD * numChilds) + (CRISPS_PER_ADULT * numAdults)
37 print("Number of PARTIAL crisp bags needed:", partialBags)
38
39 wholeBags = partialBags // 1
40 print("Order", wholeBags, "bags of crisps")
41
42 cheeseGrams = (CHEESE_PER_CHILD * numChilds) + (CHEESE_PER_ADULT * numAdults)
43
44 # -----
45 # Main program
46 # -----
47 if (cheeseGrams <= MIN_CHEESE):
48     print("Order one pack of cheese")
49 else:
50     wholeCheese = cheeseGrams // 1
51     print("Order", wholeCheese, "packs of cheese")
52
53
54 partialRolls = (ROLLS_PER_CHILD * numChilds) + (ROLLS_PER_ADULT * numAdults)
55 print("Number of PARTIAL rolls needed:", partialRolls)
56
57 wholeRolls = partialRolls // 1
58
59 if (wholeRolls <= MIN_ROLLS):
60     print("Order one pack of rolls")
61 else:
62     print("Order", wholeRolls, "rolls")
63
```

Q05

Instructions were followed to return the choice made from `getChoice()`.

`getShape` generated a random number but did not use this to select an item from the list of shapes.

`addShape()` added a shape but did not use the parameter `pShape`.

The main program did not iterate until the exit option was selected.

8 marks

```
1 # -----
2 # Import libraries
3 # -----
4 import random
5
6 # -----
7 # Constants
8 # -----
9 GET = 1
10 ADD = 2
11 SHOW = 3
12 EXIT = 4
13
14 # -----
15 # Global variables
16 # -----
17 pastaShapes = ["Bigoli",
18                "Penne",
19                "Fusilli"]
20
21 shape = ""
22 choice = 0
23
24 # -----
25 # Subprograms
26 # -----
27 # Get a menu item from the list
28 def getChoice ():
29     # =====> Write your code here
30     print ("1 - get a shape")
31     print ("2 - add a shape")
32     print ("3 - show the shapes")
33     print ("4 - exit program")
34     choice = int(input("Enter your choice: "))
35
36     # =====> Write your code here
37     return(choice)
38
39 # Display all the shapes
40 def showShapes (pTable):
41     for pasta in pTable:
42         print (pasta)
43
44 # Get a random shape
45 def getShape (pTable):
46     # =====> Write your code here
47     print("Random shape generating: ")
48
49     for shape in pTable:
50         random = random.randint(0,9)
51
52 # Add a shape
53 def addShape (pTable):
54     # =====> Write your code here
55     newPasta=str(input("What is the name of your new pasta shape: "))
56     pastaShapes.append(newPasta)
57
58 # -----
59 # Main program
60 # -----
61
62 choice = getChoice ()
63
64 # =====> Write your code here
65
66 if choice == GET:
67     Rshape = getShape(pastaShapes)
68     print(Rshape)
69 elif choice == ADD:
70     Add= addShape(pastaShapes)
71 elif choice == SHOW:
72     show= showShapes(pastaShapes)
73 elif choice == EXIT:
74     print("Goodbye")
75 else:
76     print("invalid")
```


Q06

The file is open and read, and the values on each line of the text file are split.

The design opened the file, but did not close it. The tag number was converted to an integer and back to a string, and the records were iterated once.

There was no white space added to aid readability for the programming practices.

6 lines were output, but a combination of the wrong elements were output.

```
1 # -----
2 # Global variables
3 # -----
4 cowTable = []
5
6 # =====> Write your code here
7 index = 0
8 # -----
9 # Subprograms
10 # -----
11 def showTable (pTable):
12     for cow in pTable:
13         print (cow)
14
15 # -----
16 # Main program
17 # -----
18 # =====> Write your code here
19 file = open("Cows.txt","r")
20 for line in file:
21     Linesplit = line.split(",")
22     tag = float(Linesplit[2])/100
23     #creates key
24     key =(Linesplit[0][0]+Linesplit[0][1]+str(tag)+Linesplit[1][0]+Linesplit[1][1])
25     #adds the key tag and breed to a record
26     record = key+str(tag)+Linesplit[1]
27     #adds record to list
28     cowTable.append(record)
29 showTable(cowTable)
30
```

9 marks

Take away

Students should:

- attempt every question in the paper
- follow the instructions in the paper and do not rewrite the supplied code
- remove all the syntax errors from code so that it will translate
- execute and test code with the data supplied in the question
- consider the design of the overall solution, not just the single lines of code
- use effective, but not excessive, commenting and white space to make the program logic clear.

Further support

Tracking progress

- Detailed analysis available of your students' exam performance is available on ResultsPlus for Paper 1.
- It can help you identify topics and skills where students could benefit from further learning.
- You can see actual scores for each exam question for a student, class or group.
- You can understand how your students' performance compares with class and Pearson Edexcel national averages.
- You can acquire data that may support effective learning and teaching approaches.
- For Paper 2, you can find a document (Centre Guidance for Skills Mapping) available on the website with the exam materials, as previously mentioned.



Mocks service

Information about the Edexcel Mocks Service can be found [here](#).

- Your students sit a mock exam.
- The exam is externally assessed by trained examiners.
- The returned marks can be used to identify gaps for additional revision or intervention.
- Currently 1CP2-01 is being offered as part of the mocks service.
- 1CP2-02 is not being offered.
- The mocks service attracts an additional fee.

Specimen materials

Paper 1

- Question paper
- Mark scheme

Paper 2

- Question paper
- Programming language subset
- Python code files for the student
- Mark scheme
- Python code files for the code shown in the mark scheme
- Tips for how to write your own questions based on the patterns in the specimen

Assessment – teacher training

An additional package for each Specimen set

Each Paper 2 question has:

- pointers to more information about the specific items assessed
- two or more student responses, in the form of Python code files
- a detailed mark explanation, including justification for the marks awarded and further information that you and students might find helpful.



Q&A

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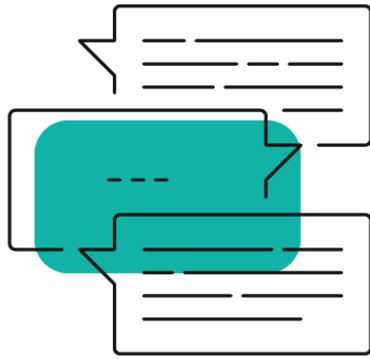
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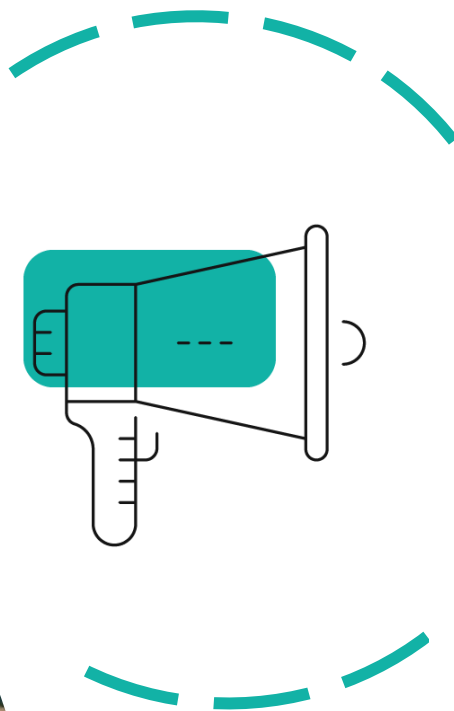
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