The impact of OCR's update from J277 v1 to v2

DRAFT

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The above textbook and presentations will be updated to reflect the new J277 specification in time for September 2020.

Green text means that something new has been added.

Red text means that something has been removed.

Changes to Subject Content

	V1			V2		What difference does it make?		
Spec	Learning Objective	Guidance	Learning Objective	Guidance	Impact Summary	What you need to do	Qualified opinion
1.2.3.c	data capacity and calculation of data capacity requirements	Calculate capacity of devices Calculate required capacity for a given set of files Calculate file sizes of sound, images and text files ◯ sound file size = sample rate x duration (s) x bit depth ◯ image file size = colour depth x image height (px) x image width (px) ◯ text file size = bits per character x number of characters **Allowed but not necessary:** *Use of 1,024 for conversions and calculations would be acceptable* *Allowance for metadata in calculations may be used*		Data storage devices have different fixed capacities Calculate required storage capacity for a given set of files Calculate file sizes of sound, images and text files ◯ sound file size = sample rate x duration (s) x bit depth ◯ image file size = colour depth x image height (px) x image width (px) ◯ text file size = bits per character x number of characters **Allowed but not necessary:** *Use of 1,024 for conversions and calculations would be acceptable* *Allowance for metadata in calculations may be used*	Medium	No need to cover storage devices capacity	This makes sense as calculating the capacity of a storage device can be quite complex. The addition of "storage" for capacity of files is good clarification.
1.2.4.b	how to add two binary integers together (up to and including 8 bits) and explain overflow errors which may occur	Understanding of the terms most significant bit, and least significant bit Ability to deal with binary numbers containing between 1 and 8 bits ◯ e.g. 11010 is the same as 00011010		Understanding of the terms 'most significant bit', and least significant bit Ability to deal with binary numbers containing between 1 and 8 bits ◯ e.g. 11010 is the same as 00011010	Low	Nothing	Just apostrophes added.
1.2.4.e	Binary shifts	Understand the effect of a binary shift (both left or right) on a number		Understand the effect of a binary shift (both left or right) on a number Carry out a binary shift (both left and right)	Low	Ensure students can do a binary shift for an exam	You would need to teach this to understand the effect of binary shift so doing a binary shift in an exam is sensible.

	V1			V2		What difference does it make?		
Spec	Learning Objective	Guidance	Learning Objective	Guidance	Impact Summary	What you need to do	Qualified opinion
1.3.1.e	the internet as a worldwide collection of computer networks: ◯ DNS (Domain Name Server) ◯ hosting ◯ the cloud ◯ web servers and clients	The concept of the Internet as a network of computer networks A DNS's role in the conversion of a URL to an IP address Concept of servers providing services (e.g. Web server = Web pages, File server = file storage/retrieval) The Cloud: remote service provision (e.g. storage, software, processing) Advantages and disadvantages of the Cloud		The concept of the Internet as a network of computer networks A Domain Name Service (DNS) is made up of multiple Domain Name Servers A DNS's role in the conversion of a URL to an IP address Concept of servers providing services (e.g. Web server = Web pages, File server = file storage/retrieval) The Cloud: remote service provision (e.g. storage, software, processing) Advantages and disadvantages of the Cloud	Medium	Nothing	This has actually made it less clear. It's now not clear how much depth to go into with stages of DNS lookup. OCR have replied to confirm that it is not necessary to teach about different stages, just that DNS servers hold the domain address and IP address of the host which is returned to the client.
1.5.1.a	The purpose and functionality of operating systems: ◯ user interface ◯ memory management and multitasking ◯ peripheral management and drivers ◯ user management ◯ file management	What each function of an operating system does o Features of a user interface o Memory management, e.g. the transfer of data between memory, and how this allows for multitasking Understand that: o Data is transferred between devices and the processor o This process needs to be managed and what this entails (e.g. the use of buffers when transferring data to a printer) User management functions, e.g.: o Allocation of an account o Access rights o Security, etc.		What each function of an operating system does o Features of a user interface o Memory management, e.g. the transfer of data between memory, and how this allows for multitasking Understand that: o Data is transferred between devices and the processor o This process needs to be managed User management functions, e.g.: o Allocation of an account o Access rights o Security, etc. File management, and the key features, e.g.: o Naming o Allocating to folders o Moving files o Saving, etc.	Medium	No longer need to teach about buffers	This removes a vague and potentially complex part of the specification.

Spec	V1 Learning Objective	V1 Guidance	V2 Learning Objective	V2 Guidance	Impact Summary	What you need to do	Qualified opinion
		File management, and the key features, e.g.: o Naming o Allocating to folders o Moving files o Saving, etc. *No: Understanding of paging or segmentation*		*No: Understanding of paging or segmentation*			
2.1.3.a	standard searching algorithms: ◯ binary search ◯ linear search	Understand the main steps of each algorithm Understand any pre-requisites of an algorithm Apply the algorithm to a data set Identify an algorithm if given the code for it *No: To remember the code for these algorithms*		Understand the main steps of each algorithm Understand any pre-requisites of an algorithm Apply the algorithm to a data set Identify an algorithm if given the code or pseudocode for it *No: To remember the code for these algorithms* *No: To remember Exam Reference Language for Merge Sort*	Medium	No need to cover ERL for merge sort	If students can understand the algorithm from code (probably means ERL) then they should be fine with pseudocode.
2.1.3.b	standard sorting algorithms: ◯ bubble sort ◯ merge sort ◯ insertion sort						
2.2.3.e	the use of arrays (or equivalent) when solving problems, including both one-dimensional and two-dimensional arrays	Arrays as fixed length static structures	the use of arrays (or equivalent) when solving problems, including both one-dimensional (1D) and two-dimensional (2D) arrays	Arrays as fixed length or static structures Use of 2D arrays to emulate database tables of a collection of fields, and records	Medium	Ensure students can implement database tables in 2D arrays with or without a header row for field names.	OCR have confirmed it is just the use of 2D arrays to emulate database tables and so no record structures are required.
2.2.3.f	how to use sub programs (functions and procedures) to produce structured code	The use of functions The use of procedures Where to use functions and procedures effectively		The use of the following within functions and procedures: o local variables/constants o global variables/constants o arrays (passing and returning)	Low	Ensure students have practised the use of these	This was kind of implied but is now made very clear.
2.2.3.g	Random number generation			Be able to create and use random numbers in a program	Low	Ensure students can do this.	This is clarifying with additional guidance.

Spec	V1 Learning Objective	V1 Guidance	V2 Learning Objective	V2 Guidance	Impact Summary	What you need to do	Qualified opinion
					What difference does it make?		
2.3.2.d	selecting and using suitable test data: o Normal o Boundary o Invalid o Erroneous	Normal test data as data which should be accepted by a program without causing errors Boundary test data as data of the correct type which is on the very edge of being valid Invalid test data as data of the correct type but outside accepted validation limit Erroneous test data as data of the incorrect type which should be rejected by a computer system Ability to identify suitable test data for a given scenario Ability to create/complete a test plan	selecting and using suitable test data: o Normal o Boundary o Invalid/Erroneous	Normal test data as data which should be accepted by a program without causing errors Boundary test data as data of the correct type which is on the very edge of being valid Invalid test data as data of the correct type which should be rejected by a computer system Erroneous test data as data of the incorrect data type which should be rejected by a computer system Ability to identify suitable test data for a given scenario Ability to create/complete a test plan	Low	Continue to teach that OCR uses an incorrect definitions of invalid and erroneous data but just focus on the term invalid.	It's a shame OCR didn't take the opportunity to remove this incorrect definitions of invalid and erroneous data. There is no difference between erroneous and invalid test data. Data this is of the incorrect type is invalid based on a type validation check. All invalid data, whether by type or other means, is invalid and also erroneous. It's good to hear that OCR will accept either term synonymously as an answer

Changes from reference language in v1 to reference language in v2

Error of do.. until loop example on page 27 used to read:

```
do
answer = input("New answer")
until answer != "Correct"
```

it now reads:

```
do
answer = input("New answer")
until answer == "Correct"
```

This has fixed an error.

Error of capital 'S' in substring on page 29 used to read:

```
subject.subString(3,5)  returns "puter"
```

it now reads:

```
subject.substring(3,5)  returns "puter"
```

This has fixed an error.

Concatenation added to page 29:

Concatenation	+		`print(stringA + stringB)` `print("Hello, your name is: " + name)`	

This allows concatenation to be used in exam questions..

Array example on page 30 changed from names to colours used to read:

Concept	Keyword(s)/Symbols	Example
Arrays		
Declaration	`array names[…]`	`array names[5]` Creates 1D array with 5 elements (index 0 to 4).

Now reads:

Arrays		

Declaration	`array colours[…]`	`array colours[5]`
		Creates 1D array with 5 elements (index 0 to 4).
		
		`array colours = ["Blue", "Pink", "Green", "Yellow", "Red"]`
		Arrays can be declared with values assigned.

I suspect this is because names isn't atomic and so bad practice and also names might be a reserved word in some languages.

Other significant Changes in specification

Page 24 "or" has replaced "/" for line 4 of the responses:

Questions asked in:	Students respond using:
Natural English OCR Exam Reference Language Flowcharts	✓ Pseudocode ✓ Flowcharts ✓ Bullet points ✓ OCR Exam Reference Language or a high-level programming language ✓ Natural English

This is just a clarification

Top of page 25 used to read

OCR Exam Reference Language is a formally defined language. All examination questions will be written in our definition language for clarity and consistency.

It now reads:

"Examination questions will be written in OCR Exam Reference Language for clarity and consistency, apart from 'Design' and 'Write' questions in Component 2 Section B (please see Section 3b)."

This removes some ambiguity and inconsistency with section 3b, but it's still a minefield as to how questions are asked and what responses are required.

Page 25 "Comparison operators" are now "Boolean operators"

This has fixed an error.

Changes to Paper 2 sample question paper v1.2

Question 8c:

"program code" changed to "line of code"

This makes sense as only one line of code is required.

End of question paper:

There is a vertical line suggesting there is a change to the line spaces but there is no change – there are still 19 lines.

Page 3 of mark scheme:

"guide" changed to "guidance" twice

Makes no difference.

Couple of changes made in the syntax guide of mark scheme that reflect the ERL changes

Question 8gii mark scheme (page 19) correction made from:

```
total = hours + mins * 60
```

to

```
total = (hours * 60) + mins
```