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COMPUTER SCIENCE

Paper 0478/11
Paper 1

Key messages

This syllabus has now been running for a few sessions and candidate's work continues to improve. There is a continued move to provide questions where candidates have to apply their knowledge, rather than just show their ability to simply remember facts. There is strong evidence that this is producing candidates who are now exhibiting an improved understanding of many of the topics.

General comments

Candidates and Centres are reminded that written papers are now scanned in and marked on computer screens by Examiners. Consequently, if a candidate writes the answer to a question on an additional page, they must indicate very clearly to the Examiner where their revised answer is to be found. Also if answers have been crossed out, the new answer must be written very clearly, so that Examiners can easily read the text and award candidates the appropriate mark.

Comments on specific questions

Question 1

Very few candidates were able to identify the correct software features for all three types of software. Many candidates were only able to identify one or two. Many candidates confused the software features of free software and freeware. The software features correctly identified for the software type, for most occasions, was for shareware.

Question 2(a) and (b)

In part **(a)** some candidates were able to correctly identify the correct reference for MAC. Many candidates gave incorrect reference, most commonly Media Access Code, Media Address Control and Memory Access Code.

In part **(b)** many candidates were able to identify that a MAC address is a unique address that identifies a device. Some candidates were able to identify that the first half of the digits were representative of the manufacturer's identification and that the second half represent the serial number of the device. Some candidates were not specific enough in the reference to what the digits represent. Candidates stated they represent the manufacturer name and a unique code for the product, and also not stating which part this is representative of.

Question 3(a) and (b)

In part **(a)** most candidates were able to correctly identify a correct sensor for the corresponding application.

In part **(b)** candidates need to make sure that they are writing a description of the system that if referred to in the question. Many candidates provided a generic description of a system that uses a sensor and a microprocessor, and did not relate their description to the system given in the question. Candidates must make sure when answering questions about systems involving sensors and microprocessors, that they think about processes involved in the specific system given in the question. They need to select suitable sensors (if not provided in the question) and describe how the microprocessor will operate to run that specific system.

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Question 4(a)(i), (ii), (iii), (b) and (c)

In part **(a)(i)** many candidates correctly identified the type of transmission.

In part **(a)(ii)** most candidates were able to refer to a USB becoming industry standard and universal to most devices. Some candidates could identify that a USB port can only have a USB device plugged in one way. Very few candidates identified further features of a USB port. Some candidates mistakenly gave features of a USB storage device or serial transmission, rather than the USB port itself.

In part **(a)(iii)** many candidates were able to correctly identify the type of signal.

In part **(b)** most candidates were able to identify a suitable example of use for each printer.

In part **(c)** many candidates were able to identify a further type of printer. Some candidates were able to expand on their answer and provide a suitable description of the operations of the printer and a suitable use. Many candidates identified Laser as their answer, some also identified answer outside the syllabus, such as Dot Matrix. Some candidates mistakenly gave LaserJet as the name for the type of printer. This is a HP brand name for printers and brand names are not creditable in answers.

Question 5(a) and (b)

In part **(a)** many candidates gained some, if not full marks for this question, demonstrating a good standard of knowledge and application of logic gates. For some candidate's diagrams, it was difficult to identify the difference between the AND gate and the OR gate. Candidates need to make sure that they draw the gates very clearly.

In part **(b)** many candidates demonstrated a good ability to follow through the logic of the circuit and provide the correct outputs.

Question 6(a) and (b)

In part **(a)** most candidates correctly identified that the http in the address would have https if the website is secure. Some candidates were awarded a mark if they fully explain that a padlock is also present to identify the security of the website.

In part **(b)** very few candidates were able to describe three stages of the process. Many candidates incorrectly referred to a request being sent to the website to identify itself, and that the website sends the SSL certificate. They must recognise it is the role of the web server to do this and not the website.

Question 7 (a) and (b)

In part **(a)** most candidates were able to provide the correct binary values.

In part **(b)** most candidates could correctly convert the first three binary digits to 194. Some candidates could convert the final binary value to E, but many candidates provided 14 as an answer to this, and did not fully convert this to the correct hexadecimal value of E.

Question 8 (a)(i), (ii) and (b)

In part **(a)(i)** many candidates recognised that the method would protect against ley logging software. Few candidates were able to expand this point to advise this is because drop down boxes cannot be recorded as a key press on a keyboard.

In part **(a)(ii)** some candidates were able to recognise that this kind of method would mean that it would be very difficult for a hacker to get the password in a single time of hacking, that it would take several times of hacking or observations to be able to attempt to gain the full password. Many candidates were not able to recognise this and repeated or reworded answers given in part **(a)(i)**.

In part **(b)** many candidates were able to identify suitable examples of biometric devices. Some candidates did not give accurate and technical names for a biometric device. The most common error was describing a retina/iris scanner as an eye scanner.

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Question 9 (a) and (b)

In part **(a)** some candidates were able to carry out the first section of the calculation correctly. Some candidates were able to achieve the correct calculation for the final check digit. Candidates need to thoroughly check their calculations. Most incorrect check digits were as a result of addition and division errors and not using the method incorrectly.

In part **(b)** many candidates were able to identify the check digit was incorrect. Some candidates were then able to explain what the correct check digit would be using the same calculation method. A common mistake that was made was candidates stating the check digit was incorrect because it was a letter.

Question 10

Most candidates were able to match the correct term with the correct definition. The most common errors were the confusion of the terms Phishing and Pharming, and cookies and spyware.

Question 11(a), (b)(i) and (ii)

In part **(a)** many candidates were able to recognise the properties of each storage media. The most common error made was in stating that a Blu-ray disc has many concentric tracks.

In part **(b)(i)** some candidates were able to describe one reason, this was commonly that they use less power. For many other responses, candidates did not refer to the question in their response. Candidates needed to refer to benefits relating to size, weight and lack of moving parts, being related to the portability of the device.

In part **(b)(ii)** few candidates were able to provide a reason why HDD was still used. The most common error made was candidates referring to the misconception that SSD cannot be as large in storage capacity as HDD.

Question 12(a), (b) and (c)

In part **(a)** many candidates were able to identify the type of barcode.

In part **(b)** some candidates were able to carry out the correct calculation and conversions. This calculation did prove challenging to many candidates.

In part **(c)** many candidates were able to describe the process of a person scanning the QR code with their mobile device, this linking to a website that would provide details about local tourist information. Some candidates were too vague in their description, stating the barcode would be scanned, or scanning the phone with an app., but not explaining this would be done with a mobile device.

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COMPUTER SCIENCE

Paper 0478/12
Paper 1

Key messages

This syllabus has now been running for a few sessions and candidate's work continues to improve. There is a continued move to provide questions where candidates have to apply their knowledge, rather than just show their ability to simply remember facts. There is strong evidence that this is producing candidates who are now exhibiting an improved understanding of many of the topics.

General comments

Candidates and Centres are reminded that written papers are now scanned in and marked on computer screens by Examiners. Consequently, if a candidate writes the answer to a question on an additional page, they must indicate very clearly to the Examiner where their revised answer is to be found. Also if answers have been crossed out, the new answer must be written very clearly, so that Examiners can easily read the text and award candidates the appropriate mark.

Comments on specific questions

Question 1

Most candidates answered this question accurately. The most common error was confusing the role of a compiler and an interpreter.

Question 2

Many candidates were able to provide suitable sensors for the given applications. Most candidates were able to list a light sensor for the first application. Many candidates were able to list gas or pH sensor for the second application. Some candidates were able to list pressure sensor for the third application. The most common error made was candidates not using the correct name for a type of sensor and rather listing and example of the type of sensor, such as O2 sensor or CO2 sensor for gas sensor, and acidity sensor for pH sensor. A number of candidates also incorrectly listed motion sensor for the third application.

Question 3(a), (b)(i) and (ii)

In part **(a)** most candidates made a correct conversion to binary.

In part **(b)(i)** some candidates were able to provide the correct three binary registers. A number of candidates did not fully understand the question and added on the time, rather than deducting it. This gave them the wrong value for the minute's register.

In part **(b)(ii)** most candidates were able to provide a correct hexadecimal conversion, either from the correct binary register, or as a follow through answer.

Question 4(a) and (b)

In part **(a)** many candidates gained a mark for stating that compression could be used. Some candidates gained further marks by stating the compression method used would be lossless, and describing how this would work. A number of candidates began to describe the two compression methods, both lossy and lossless. They could not be awarded marks for this as the question required candidates to describe one suitable method and the only suitable method was lossless.

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In part **(b)** some candidates gained marks for an accurate description of how a checksum is used. A number of candidates incorrectly referred to Nigel and Mashuda carry out the calculations and the processes. Candidates need to clearly recognise it is the computer and not the person that carries these things out. A number of candidates incorrectly described a detailed process of how to calculate a checksum. The question did not require this, it required candidates to show how it was used in error detection, so this could not be awarded marks.

Question 5

Most candidates were able to match the correct descriptions to the correct devices. The most common error was the confusion of Laser and Inkjet printers.

Question 6 (a) and (b)

In part **(a)** many candidates were able to provide both a correct type and method of transmission.

In part **(b)** some candidates gained marks for a full description of two reasons why serial is used. Many candidates were too vague in their answer. The most common of these being candidates stating that it is cheaper, but not relating this to the fact that it has a single wire rather than several.

Question 7 (a), (b) and (c)

In part **(a)** most candidates were able to list the correct outputs.

In part **(b)** many candidates were able to produce a correct logic circuit. Candidates created this in a variety of ways. Candidates are reminded to make sure that they accurate and clearly draw each logic gate. Some candidates did not draw a correct NOT logic gate, leaving the circle off the front. In some candidate's circuits, it was difficult to distinguish the difference between the AND gate and the OR gate.

In part **(c)** many candidates were able to gain some marks through the creation of a logic circuit using NAND gates. A common error was using an AND gate in the middle of the circuit, rather than two NAND gates. The question required only the use of NAND gates.

Question 8(a), (b), (c) and (d)

In part **(a)** a number of candidates only gained a single mark for the question. This is because they only joined each type to a statement using a single line. Candidates are reminded that when the question requires candidates to draw lines (not a line) this means that multiple lines may go from a term to a statement.

In part **(b)** some candidates were able to describe a range of ethical issues in a good amount of detail. A number of candidates were vague and repetitive in their descriptions and were not able to gain marks for this.

In part **(c)** many candidates were able to gain at least one mark for each term. Some candidates were vague in their response and gave little accurate detail about each term. Pharming was often confused with a description on Phishing. Virus sometimes did not include a reference to the program or software being what is self-replicating.

In part **(d)** some candidates had a clear understanding of the role of a firewall. Many candidates gave vague descriptions that did not fully detail the role of a firewall. Candidates must make sure that their descriptions display a good level of knowledge and are not a vague generic description.

Question 9(a) and (b)

In part **(a)** many candidates were able to provide two correct binary numbers.

In part **(b)** many candidates were able to provide a correct parity bit.

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Question 10

Many candidates were able to provide suitable storage device. Common errors were the confusion of CD and DVD, and also not being specific enough for sold state, stating USB, but not relating it to being a USB storage device. USB alone can refer to many things.

Question 11

Some candidates were able to provide a detailed understanding of the difference between presentation and structure. Many candidates gave a vague description of each, or described what HTML was. This could not gain marks. Very few candidates wrote about presentation often being defined in a CSS.

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COMPUTER SCIENCE

Paper 0478/13
Paper 1

Key messages

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Comments on specific questions

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Very few candidates were able to identify the correct software features for all three types of software. Many candidates were only able to identify one or two. Many candidates confused the software features of free software and freeware. The software features correctly identified for the software type, for most occasions, was for shareware.

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Most candidates were able to match the correct term with the correct definition. The most common errors were the confusion of the terms Phishing and Pharming, and cookies and spyware.

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In part **(a)** many candidates were able to recognise the properties of each storage media. The most common error made was in stating that a Blu-ray disc has many concentric tracks.

In part **(b)(i)** some candidates were able to describe one reason, this was commonly that they use less power. For many other responses, candidates did not refer to the question in their response. Candidates needed to refer to benefits relating to size, weight and lack of moving parts, being related to the portability of the device.

In part **(b)(ii)** few candidates were able to provide a reason why HDD was still used. The most common error made was candidates referring to the misconception that SSD cannot be as large in storage capacity as HDD.

Question 12(a), (b) and (c)

In part **(a)** many candidates were able to identify the type of barcode.

In part **(b)** some candidates were able to carry out the correct calculation and conversions. This calculation did prove challenging to many candidates.

In part **(c)** many candidates were able to describe the process of a person scanning the QR code with their mobile device, this linking to a website that would provide details about local tourist information. Some candidates were too vague in their description, stating the barcode would be scanned, or scanning the phone with an app., but not explaining this would be done with a mobile device.

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COMPUTER SCIENCE

Paper 0478/21
Paper 2

Key messages

Candidates who had completed the tasks for the pre-release (parcel delivery service) were able to provide answers for ***Section A*** that showed good understanding of the tasks undertaken. Candidates, who read each question carefully and answered the question, set on the paper, performed better than those who wrote out the code from their solution to the task mentioned in the question.

Candidates should take care when declaring variables, constants and arrays to ensure that the identifier declared could be used in a program. Identifiers must not contain spaces or other punctuation. Once declared the same identifier name should be used throughout the answer.

General comments

This was the third session of examination for IGCSE Computer Science paper 2, Problem-solving and Programming. Nearly all candidates attempted all the questions on the paper.

Comments on specific questions

Section A

Question 1

(a) (i) Many candidates correctly declared three variables with meaningful variable names, data types and a description of use. Common errors included incorrectly putting spaces in variable names, incorrect data types and variables used for purposes other than recording dimensions of parcels. An example of a correct answer is:

Variable Name	`Length`
Type	Real
Use	To store the length of a parcel.

(ii) Better candidates correctly stated two constants with their values. Common errors included putting spaces in constant names, incorrectly stating a range of values and incorrectly including units in the value. An example of a correct answer is:

Constant Name	`MaxDimension`
Value	50.1

(b) Algorithms were seen written in pseudocode, program code or as a flowchart. Most candidates correctly input length, width, height and weight for each parcel. Many candidates included accurate validation checks. A common error was to incorrectly include units as part of the validation checks.

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(c) Better candidates correctly included data sets with values for length, width, height and weight, then explained why these values were chosen to test their program. A common error was to include too few values rather than a set of values as stated in the question. An example of a correct answer is:

Data set	80, 80, 80, 10
Reason for choice	the highest upper boundary values that would be accepted by my program, the parcel would be rejected for the consignment because the sum of the dimensions is greater than 200.

(d) Most candidates provided an explanation of how their program calculated the price for a parcel that weighed over five kilograms. Some candidates showed an attempt at calculating a running total for the price of the consignment; better candidates gave an explanation of using a loop for all the parcels in the consignment.

Section B

Question 2

(i) Most candidates correctly suggested that the variable name `Small` should be changed to `Large` and the test should be changed from less than to greater than. Many candidates correctly identified that the variable should be set to zero at the start of the program.

(ii) Most candidates correctly changed the variable name, and the test. A common error was not to change the assignment at the start of the program.

Question 3

(i) Nearly all candidates correctly chose Boolean as the data type for Team member.

(ii) Few candidates correctly identified the data structure as an array. Very few candidates gave a creditworthy reason for their choice. An example of a correct answer is:

Data Structure	One-dimensional array(s)
Reason	To simplify the programming as a loop can be used for data entry.

Question 4

Many candidates showed the skill of using a trace table for data entry; better candidates correctly updated the variable Reject. A common error was to incorrectly include speech marks as part of the output.

Question 5

Most candidates could correctly identify `FOR` as another loop structure. Many candidates also correctly identified `WHILE`. Good descriptions were provided by better candidates. An example of a correct answer is:

Loop Structure	`FOR … TO … NEXT`
Description	A loop used for a known fixed number of iterations.

Question 6

(a) Most candidates correctly identified the reasons why none of the fields were suitable to be used as a primary key.

(b) Most candidates correctly stated a suitable new field that could be added to use as a primary key and gave a correct reason for their choice.

(c) Most candidates showed the correct columns of **Department** and **Extension** in their query-by-example grid. Common errors included incorrect ordering of fields, including incorrect extra fields and not including the table name.

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COMPUTER SCIENCE

Paper 0478/22
Paper 2

Key messages

Candidates who had completed the tasks for the pre-release (building materials delivery service) were able to provide answers for ***Section A*** that showed good understanding of the tasks undertaken. Candidates, who read each question carefully and answered the question, set on the paper, performed better than those who wrote out the code from their solution to the task mentioned in the question.

Candidates should take care when declaring variables, constants and arrays to ensure that the identifier declared could be used in a program. Identifiers must not contain spaces or other punctuation. Once declared the same identifier name should be used throughout the answer.

General comments

This was the third session of examination for IGCSE Computer Science paper 2, Problem-solving and Programming. Nearly all candidates attempted all the questions on the paper.

Comments on specific questions

Section A

Question 1

(a) (i) Many candidates correctly declared three variables with meaningful variable names, data types and a description of use. Common errors included incorrectly putting spaces in variable names and incorrect data types. An example of a correct answer is:

Variable Name	`SandWeight`
Type	Real
Use	To store the weight of a sack of sand.

(ii) Better candidates correctly stated three constants with their values. Common errors included putting spaces in constant names, incorrectly stating a range of values and incorrectly including units in the value. An example of a correct answer is:

Constant Name	`SandMaxWeight`
Value	50.1

(b) Algorithms were seen written in pseudocode, program code or as a flowchart. Most candidates correctly initialised a variable to store the total of the sack weights. A common error was to incorrectly update this total by one rather than the weight of the current sack. Many candidates incorrectly included the weight and contents check for task 1 and incorrectly outputted the number of rejected sacks.

(c) (i) Better candidates correctly included two data values for sand and explained why these values were chosen to test their program. A common error was to include a range rather than the data value stated in the question. An example of a correct answer is:

Sand data value	50.1

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Reason for choice the lowest upper boundary value for sand that would be rejected by my program.

(ii) Better candidates correctly included two data values for cement and explained why these values were chosen to test their program. A common error was to include a range rather than the data value stated in the question

(d) Most candidates provided an explanation of how their program calculated the price for an order. Many candidates showed an attempt at calculating a discounted price; better candidates provided a complete method with an explanation.

Section B

Question 2

(i) Most candidates correctly suggested that the `PRINT Total` statement should be after the end of the loop. Many candidates correctly identified that the input needed to be checked to see if it was positive or suggested that the loop should be a `FOR … NEXT` loop.

(ii) Most candidates correctly moved the `PRINT Total` statement. Some candidates correctly converted the `REPEAT … UNTIL` loop to a `FOR … NEXT` loop. Some candidates attempted the validation check; a common error was to total too few positive numbers.

Question 3

Many candidates showed the skill of using a trace table for data entry; better candidates correctly updated the variables, Area and Tins.

Question 4

Nearly all candidates could link the programming concepts of input and output with the correct examples of programming code.

Question 5

Few candidates correctly identified the data structure as an array. Very few candidates gave a creditworthy reason for their choice. An example of a correct answer is:

Data Structure	One-dimensional array
Reason	To simplify the programming as a loop can be used for data entry.

Question 6

Most candidates could correctly identify `IF` as a selection statement. Many candidates also correctly identified `CASE` as a selection statement.

Question 7

(a) Most candidates correctly identified the number of fields in each record.

(b) Most candidates correctly identified Brochure Number as the field to choose for the primary key and gave a correct reason for their choice.

(c) Most candidates correctly stated at least one data type for one of the database fields given.

(d) Some candidates showed the correct output from the query-by-example grid. Common errors included incorrectly adding extra words, symbols or punctuation.

(e) Most candidates showed some correct columns in their query-by-example grid. Common errors included incorrect field names, incorrect fields and not including the table name.

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COMPUTER SCIENCE

Paper 0478/23
Paper 2

Key messages

Candidates who had completed the tasks for the pre-release (parcel delivery service) were able to provide answers for ***Section A*** that showed good understanding of the tasks undertaken. Candidates, who read each question carefully and answered the question, set on the paper, performed better than those who wrote out the code from their solution to the task mentioned in the question.

Candidates should take care when declaring variables, constants and arrays to ensure that the identifier declared could be used in a program. Identifiers must not contain spaces or other punctuation. Once declared the same identifier name should be used throughout the answer.

General comments

This was the third session of examination for IGCSE Computer Science paper 2, Problem-solving and Programming. Nearly all candidates attempted all the questions on the paper.

Comments on specific questions

Section A

Question 1

(a) (i) Many candidates correctly declared three variables with meaningful variable names, data types and a description of use. Common errors included incorrectly putting spaces in variable names, incorrect data types and variables used for purposes other than recording dimensions of parcels. An example of a correct answer is:

Variable Name	`Length`
Type	Real
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Constant Name	`MaxDimension`
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(b) Algorithms were seen written in pseudocode, program code or as a flowchart. Most candidates correctly input length, width, height and weight for each parcel. Many candidates included accurate validation checks. A common error was to incorrectly include units as part of the validation checks.

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(c) Better candidates correctly included data sets with values for length, width, height and weight, then explained why these values were chosen to test their program. A common error was to include too few values rather than a set of values as stated in the question. An example of a correct answer is:

Data set	80, 80, 80, 10
Reason for choice	the highest upper boundary values that would be accepted by my program, the parcel would be rejected for the consignment because the sum of the dimensions is greater than 200.

(d) Most candidates provided an explanation of how their program calculated the price for a parcel that weighed over five kilograms. Some candidates showed an attempt at calculating a running total for the price of the consignment; better candidates gave an explanation of using a loop for all the parcels in the consignment.

Section B

Question 2

(i) Most candidates correctly suggested that the variable name `Small` should be changed to `Large` and the test should be changed from less than to greater than. Many candidates correctly identified that the variable should be set to zero at the start of the program.

(ii) Most candidates correctly changed the variable name, and the test. A common error was not to change the assignment at the start of the program.

Question 3

(i) Nearly all candidates correctly chose Boolean as the data type for Team member.

(ii) Few candidates correctly identified the data structure as an array. Very few candidates gave a creditworthy reason for their choice. An example of a correct answer is:

Data Structure	One-dimensional array(s)
Reason	To simplify the programming as a loop can be used for data entry.

Question 4

Many candidates showed the skill of using a trace table for data entry; better candidates correctly updated the variable Reject. A common error was to incorrectly include speech marks as part of the output.

Question 5

Most candidates could correctly identify `FOR` as another loop structure. Many candidates also correctly identified `WHILE`. Good descriptions were provided by better candidates. An example of a correct answer is:

Loop Structure	`FOR … TO … NEXT`
Description	A loop used for a known fixed number of iterations.

Question 6

(a) Most candidates correctly identified the reasons why none of the fields were suitable to be used as a primary key.

(b) Most candidates correctly stated a suitable new field that could be added to use as a primary key and gave a correct reason for their choice.

(c) Most candidates showed the correct columns of **Department** and **Extension** in their query-by-example grid. Common errors included incorrect ordering of fields, including incorrect extra fields and not including the table name.

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