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Pearson Edexcel International GCSE (9–1)

Friday 8 May 2026

Morning (Time: 2 hours)

Paper reference **4CP0/01**

Computer Science

PAPER 1: Principles of Computer Science

You must have:
Pseudocode command set (enclosed)

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*

Information

- The total mark for this paper is 80.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
- You are not allowed to use a calculator.

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.
- Marks will not be awarded for using product or trade names in answers without further explanation.

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Answer ALL questions. Write your answers in the spaces provided.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

1 Computer systems have hardware components.

(a) Computer scientists use a three-step model to show how data flows through a computer system.

Complete the diagram with the names of the other steps.

(2)



(b) Identify the type of storage that uses a laser to read data.

(1)

- ☐ **A** Cloud storage
- ☐ **B** Magnetic storage
- ☐ **C** Optical storage
- ☐ **D** Solid state storage

(c) Describe how the number of processor cores in a CPU affects the performance of a computer.

(2)

.....

.....

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.....

.....

.....



(d) **Figure 1** shows a diagram of a computer system.

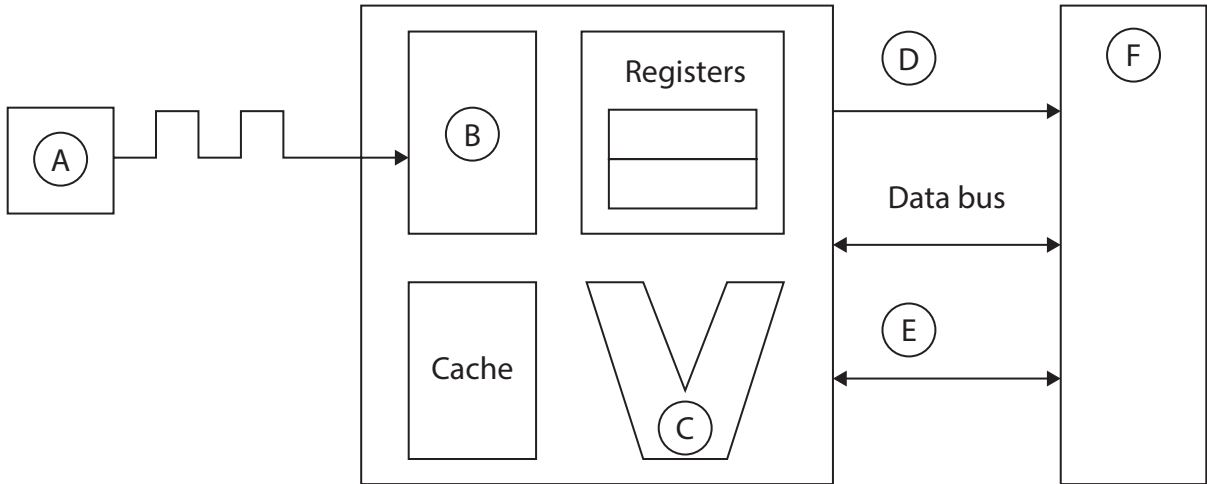


Figure 1

Complete the table by matching the component to the letters shown in **Figure 1**. (6)

Component	Letter
Address bus	
Arithmetic logic unit	
Clock	
Control bus	
Control unit	
Main memory	

(Total for Question 1 = 11 marks)



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2 Computers use software.

(a) Identify the function of an operating system that uses scheduling. (1)

- ☐ A File management
- ☐ B Process management
- ☐ C Security management
- ☐ D User management

(b) A software development company works on different programs.

Complete the table to show the most appropriate programming language translator for each program.

(3)

Program	Translator
A printer driver is written in a low-level language. The driver controls the printer's hardware.	
A data analysis program is written in a high-level language. The program must run on different computer platforms.	
A computer game is written in a high-level language. The program runs on one type of games console.	

(c) Software systems can be protected by audit trails.

Give **two** items recorded in an audit trail.

(2)

1

2



(d) Software can contain logical conditions.

Complete the truth table to show the results of **each** operation.

(2)

A	B	A OR B	NOT (A OR B)
0	0		
0	1		
1	0		
1	1		

(e) A Caesar cipher encrypts data.

Describe how a Caesar cipher works.

(3)

(Total for Question 2 = 11 marks)

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3 Organisations use computer networks.

(a) **Figure 2** shows a network topology.

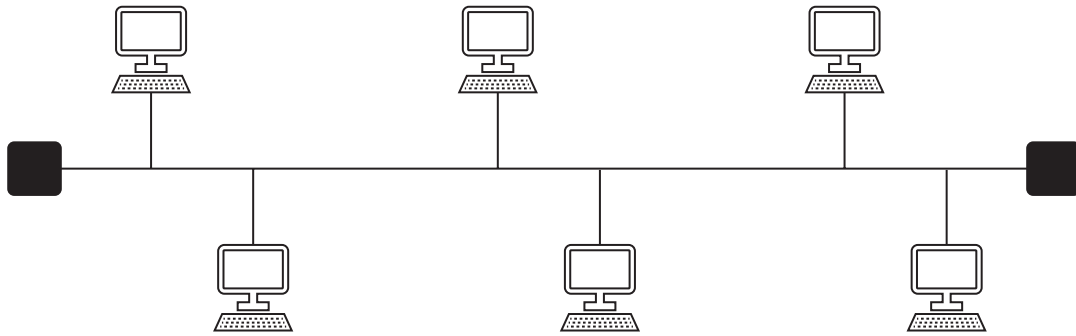


Figure 2

(i) State the name of this network topology.

(1)

(ii) State what is meant by the term **network topology**.

(1)

(iii) Give **three** drawbacks of using the network topology in **Figure 2**.

(3)

1

2

3



(b) Identify which **one** of these is used to find the IP address of a webserver located at www.pearson.com

(1)

- ☐ **A** DNS
- ☐ **B** HTTP
- ☐ **C** URL
- ☐ **D** WWW

(c) A mobile phone is connected to headphones using a Bluetooth connection.

Identify this type of network.

(1)

- ☐ **A** 5G
- ☐ **B** LAN
- ☐ **C** PAN
- ☐ **D** WAN

(d) Data is sent across networks using bit patterns.

The value 1011 0010 represents an 8-bit binary value in two's complement.

Convert the two's complement binary integer 1011 0010 to denary.

(2)



(e) Computers connect to networks using wired or wireless connections.

(i) Wired connections are not obstructed by walls.

Give **two other** advantages of using wired connections.

(2)

1

.....

2

.....

(ii) Computer A and computer B are both in range of the same wireless access point (WAP).

Only one computer can connect to the WAP at a time.

Construct a logic statement, using AND, OR and NOT with the letters A and B, to represent this problem.

(3)

(Total for Question 3 = 14 marks)



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4 Cloud storage and artificial intelligence (AI) are emerging trends in computing.

(a) Individuals and organisations use cloud storage.

(i) Describe **one** security risk of storing files on the cloud.

(2)

(ii) Explain **one** benefit to an organisation of using cloud storage.

(2)

(b) Many applications now use artificial intelligence.

(i) Describe what is meant by the term **artificial intelligence**.

(2)



(ii) A school is considering expanding the use of artificial intelligence by students and teachers.

Evaluate the use of AI for this purpose and make a recommendation to the school.

You should consider:

- benefits and drawbacks
- ethical issues.

(6)

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5 Computers use binary to represent and store data.

(a) Identify the value that represents the largest storage capacity.

(1)

- ☐ A 0.1 GiB
- ☐ B 10 MB
- ☐ C 1,250 KB
- ☐ D 1,000,000 bytes

(b) **Figure 3** shows the first line of a bitmap image that has three colours.



Figure 3

Figure 4 shows the binary value of each colour.

	00
	01
	10

Figure 4



(i) A run-length encoding (RLE) algorithm is used to compress the image.

- Two bits are used to represent the pixel colour.
- Four bits are used to represent the number of pixels in each run. This is encoded as an unsigned 4-bit integer.

Complete the table to give the compressed encoding for the image shown in **Figure 3**.

(3)

--	--	--	--	--	--

(ii) The complete image contains 51 lines.

Each line contains 16 pixels.

Construct an expression to calculate the total number of bytes required to store the complete image.

You do **not** need to do the calculation.

(3)

(iii) The number of colours in the image is increased from three to four.

Explain the effect on the storage space required to store the image.

(2)

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(c) An analogue sound is sampled and represented in digital form.

The sound is one second long and is sampled at 10 Hz.

The digital representation has a bit depth of 4 and is stored using sign and magnitude representation.

Sound data:

0000 1111 0000 0111 0111 0111 0000 1111 1111 0000

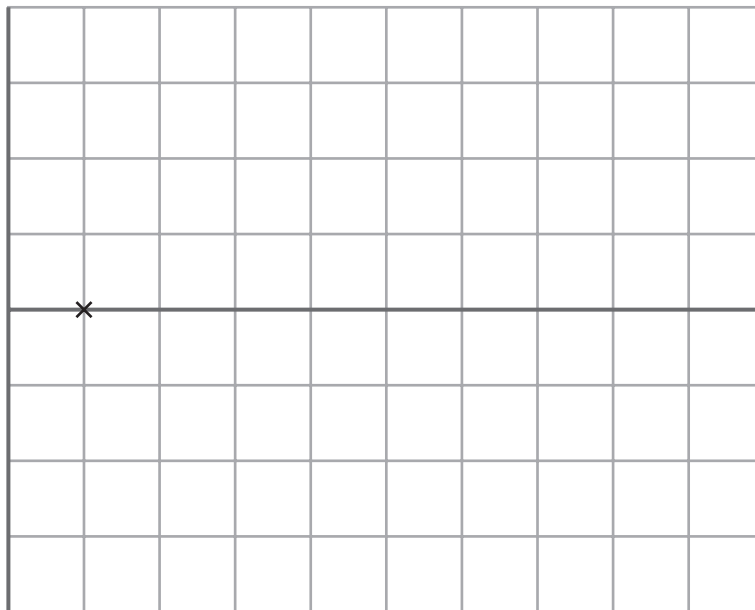
Draw a graph to represent the data sampled.

You must include:

- labels for the x and y axes
- values for the x and y axes
- each sample plotted as an X
- samples joined up to show the digital form.

The first sample has been plotted for you.

(6)



(Total for Question 5 = 15 marks)

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6 Algorithms are used to solve problems.

(a) **Figure 5** shows an algorithm written in pseudocode.

01	SET total TO 0
02	SET counter TO 1
03	SEND 'Input a number' TO DISPLAY
04	RECEIVE number FROM (INTEGER) KEYBOARD
05	WHILE counter < number DO
06	SET total TO total + counter
07	SET counter TO counter + 1
08	END WHILE
09	SEND 'The sum is ' & total TO DISPLAY

Figure 5

(i) Give **two** benefits of writing algorithms in pseudocode.

(2)

- 1
- 2

(ii) Explain why (INTEGER) is required in line 04 of the algorithm.

(2)

-
-
-
-
-



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When the number 5 is entered, the algorithm should display `The sum is 15.`

There is an error in the algorithm.

- (iii) Complete the table to identify the line that contains the error and show the corrected code. (2)

Line	Correct code

- (b) Trace tables are used when developing algorithms.

Describe the purpose of a trace table. (2)

.....

.....

.....

.....

(c) **Figure 6** shows an algorithm.

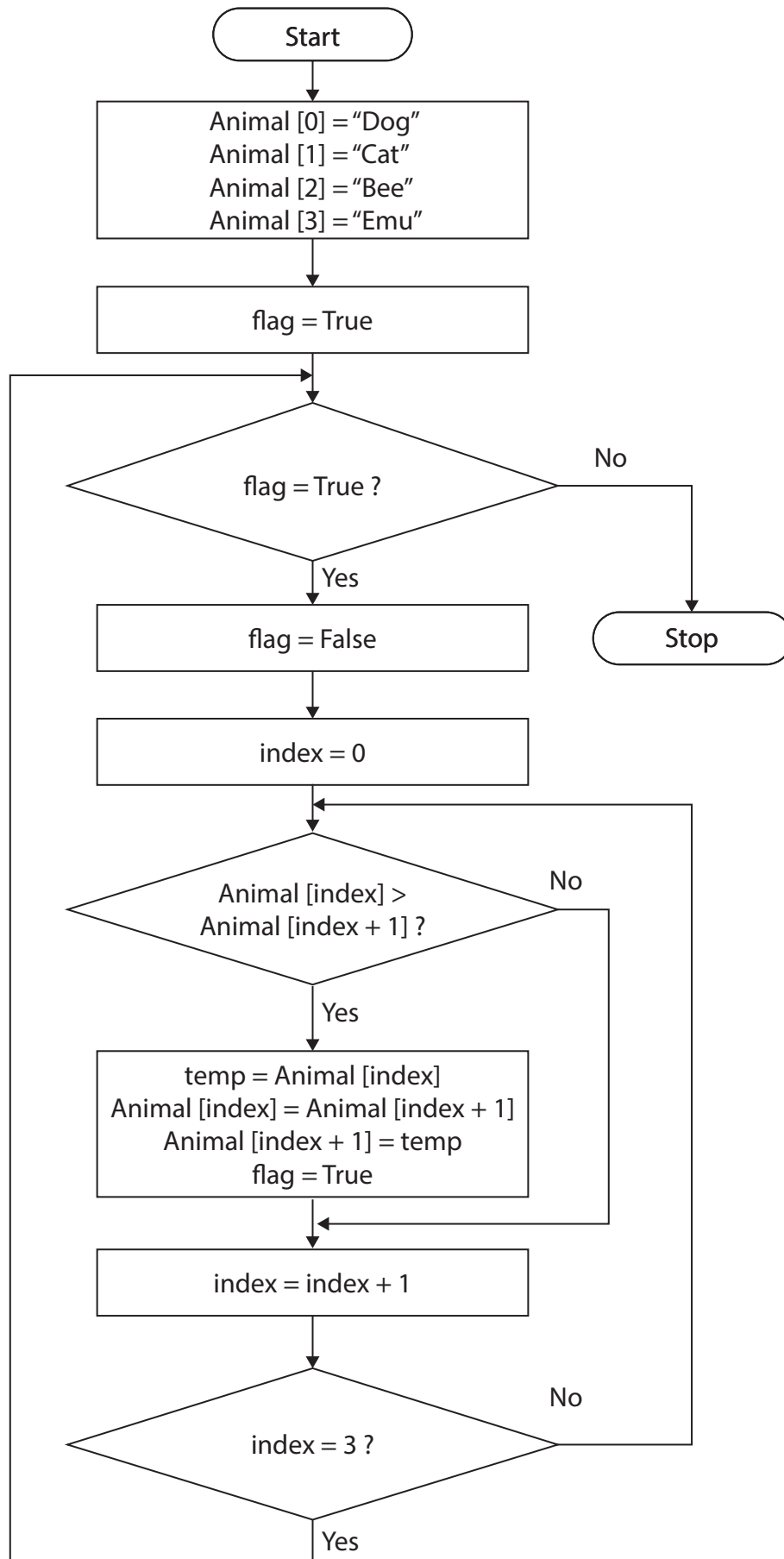


Figure 6



You may not need to use all the rows.

[illegible]

(ii) Give the purpose of the algorithm in **Figure 6**.

(1)

(iii) Explain why the variable `temp` is needed in the algorithm.

(2)

(Total for Question 6 = 17 marks)

TOTAL FOR PAPER = 80 MARKS

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Pearson Edexcel International GCSE (9–1)

Friday 8 May 2026

Paper
reference

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Computer Science

Component 1

Pseudocode command set

Resource Booklet

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Pseudocode command set

Questions in the written examination that involve code will use this pseudocode for clarity and consistency. However, students may answer questions using any valid method.

Data types

INTEGER

REAL

BOOLEAN

CHARACTER

Type coercion

Type coercion is automatic if indicated by context. For example $3 + 8.25 = 11.25$ (integer + real = real)

Mixed mode arithmetic is coerced like this:

	INTEGER	REAL
INTEGER	INTEGER	REAL
REAL	REAL	REAL

Coercion can be made explicit. For example, RECEIVE age FROM (INTEGER) KEYBOARD assumes that the input from the keyboard is interpreted as an INTEGER, not a STRING.

Constants

The value of constants can only ever be set once. They are identified by the keyword CONST. Two examples of using a constant are shown.

CONST REAL PI

SET PI TO 3.14159

SET circumference TO radius * PI * 2

Data structures

ARRAY

STRING

Indices start at zero (0) for all data structures.

All data structures have an append operator, indicated by &.

Using & with a STRING and a non-STRING will coerce to STRING. For example, SEND 'Fred' & age TO DISPLAY, will display a single STRING of 'Fred18'.

Identifiers

Identifiers are sequences of letters, digits and '_', starting with a letter, for example: MyValue, myValue, My_Value, Counter2

Functions

LENGTH()

For data structures consisting of an array or string.

RANDOM(n)

This generates a random number from 0 to n.

Comments

Comments are indicated by the # symbol, followed by any text.

A comment can be on a line by itself or at the end of a line.

Devices

Use of KEYBOARD and DISPLAY are suitable for input and output.

Additional devices may be required, but their function will be obvious from the context. For example, CARD_READER and MOTOR are two such devices.

Notes

In the following pseudocode, the < > indicates where expressions or values need to be supplied. The < > symbols are not part of the pseudocode.

Variables and arrays

Syntax	Explanation of syntax	Example
SET Variable TO <value>	Assigns a value to a variable.	SET Counter TO 0 SET MyString TO 'Hello world'
SET Variable TO <expression>	Computes the value of an expression and assigns to a variable.	SET Sum TO Score + 10 SET Size to LENGTH(Word)
SET Array[index] TO <value>	Assigns a value to an element of a one-dimensional array.	SET ArrayClass[1] TO 'Ann' SET ArrayMarks[3] TO 56
SET Array TO [<value>, ...]	Initialises a one-dimensional array with a set of values.	SET ArrayValues TO [1, 2, 3, 4, 5]
SET Array [RowIndex, ColumnIndex] TO <value>	Assigns a value to an element of a two-dimensional array.	SET ArrayClassMarks[2,4] TO 92

Selection

Syntax	Explanation of syntax	Example
IF <expression> THEN <command> END IF	If <expression> is true then command is executed.	IF Answer = 10 THEN SET Score TO Score + 1 END IF
IF <expression> THEN <command> ELSE <command> END IF	If <expression> is true then first <command> is executed, otherwise second <command> is executed.	IF Answer = 'correct' THEN SEND 'Well done' TO DISPLAY ELSE SEND 'Try again' TO DISPLAY END IF

Repetition		
Syntax	Explanation of syntax	Example
WHILE <condition> DO <command> END WHILE	Pre-conditioned loop. Executes <command> whilst <condition> is true.	WHILE Flag = 0 DO SEND 'All well' TO DISPLAY END WHILE
REPEAT <command> UNTIL <expression>	Post-conditioned loop. Executes <command> until <condition> is true. The loop must execute at least once.	REPEAT SET Go TO Go + 1 UNTIL Go = 10
REPEAT <expression> TIMES <command> END REPEAT	Count controlled loop. The number of times <command> is executed is determined by the expression.	REPEAT 100-Number TIMES SEND '*' TO DISPLAY END REPEAT
FOR <id> FROM <expression> TO <expression> DO <command> END FOR	Count controlled loop. Executes <command> a fixed number of times.	FOR Index FROM 1 TO 10 DO SEND ArrayNumbers[Index] TO DISPLAY END FOR
FOR <id> FROM <expression> TO <expression> STEP <expression> DO <command> END FOR	Count controlled loop using a step.	FOR Index FROM 1 TO 500 STEP 25 DO SEND Index TO DISPLAY END FOR
FOR EACH <id> FROM <expression> DO <command> END FOREACH	Count controlled loop. Executes for each element of an array.	SET WordsArray TO ['The', 'Sky', 'is', 'grey'] SET Sentence to "" FOR EACH Word FROM WordsArray DO SET Sentence TO Sentence & Word & "" END FOREACH

Input/output

Syntax	Explanation of syntax	Example
SEND <expression> TO DISPLAY	Sends output to the screen.	SEND 'Have a good day.' TO DISPLAY
RECEIVE <identifier> FROM (type) <device>	Reads input of specified type.	RECEIVE Name FROM (STRING) KEYBOARD RECEIVE LengthOfJourney FROM (INTEGER) CARD_READER RECEIVE YesNo FROM (CHARACTER) CARD_READER

File handling

Syntax	Explanation of syntax	Example
READ <File> <record>	Reads in a record from a <file> and assigns to a <variable>. Each READ statement reads a record from the file.	READ MyFile.doc Record
WRITE <File> <record>	Writes a record to a file. Each WRITE statement writes a record to the file.	WRITE MyFile.doc Answer1, Answer2, 'xyz 01'

Subprograms

Syntax	Explanation of syntax	Example
PROCEDURE <id> (<parameter>, ...) BEGIN PROCEDURE <command> END PROCEDURE	Defines a procedure.	PROCEDURE CalculateAverage (Mark1, Mark2, Mark3) BEGIN PROCEDURE SET Avg to (Mark1 + Mark2 + Mark3)/3 END PROCEDURE
FUNCTION <id> (<parameter>, ...) BEGIN FUNCTION <command> RETURN <expression> END FUNCTION	Defines a function.	FUNCTION AddMarks (Mark1, Mark2, Mark3) BEGIN FUNCTION SET Total to (Mark1 + Mark2 + Mark3)/3 RETURN Total END FUNCTION
<id> (<parameter>, ...)	Calls a procedure or a function.	Add (FirstMark, SecondMark)



Arithmetic operators	
Symbol	Description
+	Add
–	Subtract
/	Divide
*	Multiply
^	Exponent
MOD	Modulo
DIV	Integer division

Relational operators	
Symbol	Description
=	equal to
<>	not equal to
>	greater than
>=	greater than or equal to
<	less than
<=	less than or equal to

Logical operators	
Symbol	Description
AND	Returns true if both conditions are true.
OR	Returns true if any of the conditions are true.
NOT	Reverses the outcome of the expression; true becomes false, false becomes true.

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