Your notes

GCSE Computer Science: revision notes

Programming fundamentals

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Variables and constants

- A **variable** is a named location in memory that stores a value, which can change while the program runs. A **constant** stores a value that does not change, such as VAT = 0.2.
- **Assignment** gives a **variable** a value. AQA pseudocode writes score ← 0; OCR's Exam Reference Language and Python write score = 0.

The three programming constructs

- Sequence: instructions run one after another. Selection: IF ... ELSE (or CASE / SWITCH) chooses a path. Iteration: loops repeat code.
- Count-controlled (definite) iteration: a FOR loop repeats a set number of times. Condition-controlled (indefinite) iteration: WHILE and REPEAT ... UNTIL loops repeat until a condition changes. (OCR writes DO ... UNTIL; Python only has WHILE.)
- A WHILE loop checks its condition at the start, so it might not run at all. A REPEAT ... UNTIL loop checks at the end, so it always runs at least once.
- Loops and IF statements can be nested inside each other.

Operators

- Arithmetic: + – * / and also integer division (DIV) and remainder (MOD). 17 DIV 5 = 3 and 17 MOD 5 = 2. In Python these are // and %.
- Comparison: = (== in Python), ≠ (!= in Python), <, >, ≤ (<=) and ≥ (>=). Boolean operators: AND, OR and NOT.
- Powers: OCR writes 2 ^ 3 and Python writes 2 ** 3. Both mean $2^3 = 8$.

Input, output and strings

- Programs take input from the user and display output. Input from the keyboard arrives as a string.
- String handling includes finding the length, taking a substring, **concatenation** (joining strings) and changing the case. "Hello" has length 5.
- Programs can also generate random numbers, such as a random integer from 1 to 6 for a dice.

File handling (OCR and Edexcel)

- Programs can save data in a text file, so it is kept after the program closes.
- The steps are: open the file (to read, write or append), read or write the data, then close the file.
- Writing replaces what is already in the file; appending adds to the end of it.
- In Python, open("scores.txt", "a") opens a file for appending, and file.close() closes it.

Key terms

Variable	A named memory location that stores a value that can change.
Constant	A named value that does not change while the program runs.
Assignment	Giving a variable a value.
Count-controlled loop	A loop that repeats a set number of times, such as FOR.
Condition-controlled loop	A loop that repeats until a condition changes, such as WHILE.
DIV	Integer division: how many whole times one number goes into another.
MOD	The remainder after integer division.
Concatenation	Joining two or more strings together.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What is 17 MOD 5?
2. What is 17 DIV 5?
3. What is a variable?
4. Why is VAT_RATE a good choice for a constant?
5. Which type of loop is a FOR loop?
6. Which loop always runs at least once?

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7. Which construct is used to choose between paths?
8. What does concatenation mean?

Answers

1. 2
2. 3
3. A named memory location whose value can change
4. Its value stays the same while the program runs
5. Count-controlled
6. REPEAT ... UNTIL
7. Selection
8. Joining strings together

What to do next

Practise 27 questions on this topic

Try 7 exam questions, with mark schemes

Read the lesson, one step at a time

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