

Exercise 7

Module 7: Algorithms and Computational Thinking

1.

Complete each sentence. Choose from:

algorithm · decomposition · abstraction · pattern recognition · finite · pseudocode

(a) The four ideas in Computational Thinking are: _____, pattern recognition, abstraction, and algorithms.

(b) A good algorithm must always stop this property is called being _____.

(c) Writing steps in plain English before coding is called _____.

(d) Spotting that the same check is needed for many fields is called _____.

(e) Hiding detail inside a function is an example of _____.

2.

Write the Pseudocode

Write pseudocode for this task using plain English, no Python syntax needed, just clear numbered steps.

Task: Read the NDVI value of a field. If it is below 0.4, log a warning and recommend fertiliser. If it is above 0.7, log that the crop is healthy. Otherwise log that it is normal.

Step 1: _____
Step 2: _____
Step 3: _____
Step 4: _____
Step 5: _____
Step 6: _____

3.

Spot the Pattern and Rewrite

This code has a lot of repetition:

```
if moisture_a < 0.30:
    print('Field A: irrigate')
if moisture_b < 0.30:
    print('Field B: irrigate')
if moisture_c < 0.30:
    print('Field C: irrigate')
```

What is the pattern that repeats?

4.

Answer each question in one or two short sentences.

(a) What makes an algorithm different from just a list of ideas?

(b) Why is it useful to write pseudocode BEFORE writing Python code?

(c) Think of one everyday example of abstraction from outside computing.

(d) Think of one real farming task where decomposition would help.
