AP COMPUTER SCIENCE A • EXERCISE SHEET

2.4 Nested if Statements

Name: _____ Class: _____ Date: _____ **Total: 8 marks**

Objective

Build the skills to answer exam questions on **nested if statements**.

You must be able to:

- write a **nested if** 嵌套条件 by placing one `if` inside another
- use an **else-if chain** to choose among several mutually exclusive cases
- understand that only one branch of an else-if chain runs for each input

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ Nested ifs and else-if chains

A **nested if** places one `if` inside another. An **else-if chain** tests conditions in order and runs the **first** one that is true:

```
if (s >= 90)      grade = "A";
else if (s >= 80) grade = "B";
else              grade = "C";
```

For any single input, **exactly one** branch runs.

■ Tracing a value

Trace `s = 85` through the chain: is `s >= 90`? No. Is `s >= 80`? Yes, so `grade = "B"` and the rest is skipped. Order matters – put the **strictest** test first, or a looser test will catch the value early.

2 Practice

2.1 State what a nested if is. [1]

2.2 State how many branches of an else-if chain run for one input. [1]

2.3 For the grade example above, state the result when `s` is 82. [1]

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3 Exam-style questions

3.1 An else-if chain lets you choose among [1]

- **A** one case
- **B** exactly two cases
- **C** several mutually exclusive cases
- **D** no cases

3.2 For one input, the number of branches of an else-if chain that run is [1]

- **A** zero
- **B** one
- **C** two
- **D** all of them

3.3 `if (m >= 50) { if (m >= 75) r = "distinction"; else r = "pass"; } else r = "fail";`.

(a) State `r` when `m` is 90. [1]

(b) State `r` when `m` is 55. [1]

(c) State `r` when `m` is 30. [1]

4 Go further

- work through the **2.4 Nested if Statements** lesson on the **Learn** page;
- read the **Boolean Expressions and if Statements** section of the AP Computer Science A handout on the **Know** page.

Solutions

2.1 an if statement placed inside another if statement.

2.2 one.

2.3 `B`.

3.1 C.

3.2 B.

3.3 (a) `distinction`. (b) `pass`. (c) `fail`.