Exercise walk-through

Nested if Statements ▪ 2.4

eXercise

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

Method — 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:

```
kif+w p(ns+w oo=+w l+m+mi90p)+w      ngrade+w o=+w err"nAerr"p;
kelse+w kif+w p(ns+w oo=+w l+m+mi80p)+w ngrade+w o=+w err"nBerr"p;
kelse+w              ngrade+w o=+w err"nCerr"p;
```

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

Method — 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.

Practice 2.1 ▪ 1 mark

State what a nested if is.

Solution 2.1

Worked steps

an if statement placed inside another if statement B1.

Practice 2.2 ▪ 1 mark

State how many branches of an else-if chain run for one input.

Solution 2.2

Method: Nested ifs and else-if chains

Worked steps

one B1.

Practice 2.3 ▪ 1 mark

For the grade example above, state the result when $\mathtt{s}$ is 82.

Solution 2.3

Worked steps

B B1.

Exam-style 3.1 ▪ 1 mark

An else-if chain lets you choose among

A one case

B exactly two cases

C several mutually exclusive cases

D no cases

Solution 3.1

Method: Nested ifs and else-if chains

A one case

B exactly two cases

C several mutually exclusive cases ✓

D no cases

Worked steps

C.

Exam-style 3.2 ▪ 1 mark

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

A zero

B one

C two

D all of them

Solution 3.2

Method: Nested ifs and else-if chains

A zero

B one ✓

C two

D all of them

Worked steps

B.

Exam-style 3.3 ▪ 1 mark

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

(a) State `r` when `m` is 90.
(b) State `r` when `m` is 55.
(c) State `r` when `m` is 30.

Solution 3.3

Worked steps

(a) `distinction` B1. (b) `pass` B1. (c) `fail` B1.