



F2.3 else, elif and Boolean operators

Decisions and loops · GCSE · OCR J277 2.2.1, AQA 8525 3.2.5, Edexcel
1CP2 1.2.3 · about 15 min

What this lesson is about

Choosing between outcomes, and joining conditions with and, or and not.

- else: what to do otherwise
- elif: several choices
- Joining conditions: and, or, not
- Checking a range

Questions

8 marks in all

1. What does this program print?

[1 mark]

```
d = 30
if d < 20:
    print("stop")
elif d < 40:
    print("careful")
else:
    print("go")
```

Answer:

careful

Python checks from the top and runs the first block whose question is True: $30 < 20$ is False, $30 < 40$ is True.

2. With an `if` and an `else`, how many of the two blocks run?

[1 mark]

- ☐ A Exactly one
- ☐ B Both
- ☐ C Neither
- ☐ D It depends on the program

Answer: A. The if block when the question is True, the else block when it is False. Never both, never neither.

3. What does this program print?

[1 mark]

```
print(True and False)
print(True or False)
print(not True)
```

Answer:

False
True
False

and needs both sides True, or needs at least one, and not flips the answer.

4. The traffic light checks `d < 40` first and `d < 20` second, with `elif`. What goes wrong when `d` is 10? [1 mark]
- ☐ A It says careful instead of stop: the first True question wins
 - ☐ B Nothing goes wrong
 - ☐ C It says both
 - ☐ D An error

Answer: A. `10 < 40` is True, so that block runs and the rest are skipped. With `elif`, the order of the questions matters.

5. What does this program print? [1 mark]

```
d = 50
b = 10
if d > 30 and b > 20:
    print("drive")
else:
    print("stay")
```

Answer:

stay

`d > 30` is True but `b > 20` is False, and and needs both.

6. What is `elif` short for? (two words) [1 mark]

Answer: else if. `elif` means else if: checked only when the questions above it were False.

7. In a truth table, when is A OR B False? [1 mark]

- ☐ A Only when A and B are both False
- ☐ B When either is False
- ☐ C When both are True
- ☐ D Never

Answer: A. OR needs at least one side True, so it is False only when both sides are False.

8. What does this program print? [1 mark]

```
d = 25
if d >= 20 and d <= 40:
    print("in the zone")
else:
    print("outside")
```

Answer:

in the zone

25 is at least 20 and at most 40, so both sides are True.

The task: traffic light

Drive 15 cm, then read the distance and set the LED: red and print `stop` if the wall is under 20 cm away; orange and `careful` if under 40; green and `go` otherwise. The wall is placed so that the right answer is orange, but write all three branches.

```
# the two lines every program starts with: the commands, then the robot
from bugbot import *
connect()

forward(50, distance=15)
d = distance()
if d < 20:
    led("red")
    print("stop")
```

The hint students can ask for: Drive first, then read the distance once into a variable and test it. Write all three branches, even though only one of them can run today.

A solution

```
from bugbot import *
connect()
forward(50, distance=15)
d = distance()
if d < 20:
    led('red')
    print('stop')
elif d < 40:
    led('orange')
    print('careful')
else:
    led('green')
    print('go')
```

Any program that meets the task's checks is marked correct in the simulator; this is one way, not the only way.