WORKSHEET

10.3 Watching the others

BugBotLab

Competing · Robot club · about 14 min

Name _____ Class _____ Date _____

What this lesson is about

others() and the camera tags, and giving way early so contact never costs you the game.

- Where everyone is
- Giving way

Questions

6 marks in all

1. In the traffic task, a student calls `others()` to find the moving robots. What happens? [1 mark]

- ☐ **A** It does not work: `others()` is only there in games, so in a task use the camera
- ☐ **B** It lists both robots with their positions
- ☐ **C** It returns what the camera can see
- ☐ **D** It sends a message asking where they are

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

```
import math
bots = [{"name": "red-1", "x": 30, "y": 40}, {"name": "blue-2", "x": -6, "y": 8}, {"name":
"blue-3", "x": 20, "y": 0}]
closest, best = None, 1e9
for bot in bots:
    d = math.hypot(bot["x"], bot["y"])
    if d < best:
        closest, best = bot["name"], d
print(closest, best)
```

3. You touch another robot that drove into you. Whose fault is it, in most games? [1 mark]

- ☐ **A** Yours: touching another robot is your fault, whoever moved
- ☐ **B** Theirs, because they moved
- ☐ **C** Nobody's
- ☐ **D** Whoever has the lower score

4. Which habits keep you out of trouble on a busy mat? [1 mark]

Tick every answer that is true.

- ☐ **A** Look before you commit
- ☐ **B** Go round with `left()` or `right()`
- ☐ **C** Give way early
- ☐ **D** Speed up to get past before they arrive
- ☐ **E** Push through, since they moved into you

5. `robots()` comes back as `[['red', 160, 118, 35.0]]`. What is 35.0? [1 mark]

- ☐ **A** How far away that robot is, in centimetres
- ☐ **B** Its bearing in degrees
- ☐ **C** How big its dome looks, in pixels
- ☐ **D** Its id

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

```
for gap in [40, 25, 12]:
    if gap < 25:
        print(gap, "step aside")
    else:
        print(gap, "carry on")
```

The task: through the traffic

Two robots are driving back and forth across the mat, 35 cm and 55 cm ahead of you. Get from the start to the green zone without touching either of them, or anything else.

```
from bugbot import *
connect()

while position()[1] < 80:
    forward(50)
    wait(0.1)

stop()
```

Plan your program here, then type it in and press Run.

Do it on the robot

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The simulator checks it and tells you when it passes. Nothing to install, no account.

Challenges

1. Print the bearing of the nearest robot every time round the loop, and read the log to see when it got close.
2. Wait for a gap instead of going round: stop while something is within 30 cm, then carry on.
3. Cross the mat sideways instead, facing forward the whole way.