



6.7 Where will it be

Seeing more · Robot club · about 20 min

Name _____

Class _____

Date _____

What this lesson is about

Two sightings give a velocity: give way to a robot crossing your path.

- A robot that crosses your path
- Give way
- Predicting

Questions

7 marks in all

1. Robot 102's bearing sweeps from -36 to 33 degrees while its distance only goes from 58 cm down to 40 [1 mark]
cm and back out. What is it doing?

- ☐ A Crossing in front of you
- ☐ B Driving straight at you
- ☐ C Driving away from you
- ☐ D Standing still

2. What does this program print?

[1 mark]

```
last = None
for bearing in [-30.0, -20.0, -8.0, 5.0, 18.0]:
    if last is not None:
        print(bearing, "coming" if abs(bearing) < abs(last) else "leaving")
    last = bearing
```

3. The first give way rule stops whenever robot 102 is close and in front. What is wrong with it?

[1 mark]

- ☐ A It also stops for a robot that is already moving away from its path
- ☐ B It never stops at all
- ☐ C It drives into the robot
- ☐ D It only works on the left side

4. The rule is `tags` and `tags[0][3] < 30` and `abs(bearing_of(tags[0][1])) < 35`. Robot 102 is 25 [1 mark]
cm away at a bearing of -40. Does the robot stop?

- ☐ A No: 40 degrees is outside the 35 degree window
- ☐ B Yes: it is closer than 30 cm
- ☐ C Yes: the bearing is negative
- ☐ D No: `abs` makes the bearing 0

5. When robot 102 is out of view, the prediction code sets `last = None` . Why? [1 mark]
- ☐ A An old bearing from before it was lost would give a wrong comparison next time
 - ☐ B `None` makes the robot stop
 - ☐ C Otherwise the tag detector switches off
 - ☐ D To count how long it was lost
6. `waited` goes up by 1 on every tick the robot stops, at ten ticks a second. At the end `waited` is 23. [1 mark]
What does `waited / 10` print?
-
7. What does the general version of prediction, used by cars and ships, do? [1 mark]
- Tick every answer that is true.
- ☐ A Keep the last few positions of the other robot
 - ☐ B Work out its velocity from them
 - ☐ C Check whether the two paths cross in the next second or two
 - ☐ D Stop for every robot it can see

The task: give way

Reach the green zone without touching the red robot.

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

# drive forward at 50 for 80 cm, then stop
forward(50, distance=80)
```

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



Do it on the robot

www.bugbotlab.com/learn/6-7-where-will-it-be/

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

Challenges

1. Print `coming` or `leaving` each time you see the robot.
2. Instead of stopping, slow down to 20 when the robot is coming across, and see whether it still passes safely.

3. Work out the robot's position on the mat from your position and its bearing and distance, keep the last two, and print its speed in cm per second.