



6.4 Seeing other robots

Seeing more · Robot club · about 15 min

Name _____

Class _____

Date _____

What this lesson is about

Tags from 100 up say who and how far; LEDs say what.

- Why colour and not a tag
- Finding one
- Distance and bearing
- Telling them apart
- Talking with light

Questions

7 marks in all

1. The camera reads a tag with id 101. What is it?

[1 mark]

- ☐ A A marker on the mat
- ☐ B Another robot
- ☐ C A blob
- ☐ D A misread, because ids stop at 99

2. What does this program print?

[1 mark]

```
seen = [['green', 60, 120, 55.0], ['red', 240, 110, 42.0]]
for colour, cx, cy, dist in seen:
    print(colour, dist, round((cx - 160) * 120 / 320, 1))
```

3. What does `robots()` give?

[1 mark]

- ☐ A Only the robots in view, each as `[colour, cx, cy, distance]`
- ☐ B Every robot in the arena, seen or not
- ☐ C The ids of the robots, as plain numbers
- ☐ D The tags on the robots

4. Which of these are true?

[1 mark]

Tick every answer that is true.

- ☐ A A robot's dome colour says which robot it is
- ☐ B Its dome can also say what it is doing
- ☐ C A robot with its LED off is not in `robots()`
- ☐ D Domes are best told apart by shade, like light and dark green

5. A robot's dome is at `cx = 272`. What is its bearing in degrees?

[1 mark]

6. Your robot runs `led("red")`. What can the other robots see?

[1 mark]

- ☐ A A red blob, if they look for red with the blob detector
- ☐ B A tag with a new id
- ☐ C Nothing, the LED is only for people
- ☐ D A red line

7. What does this program print?

[1 mark]

```
seen = [['green', 90, 120, 30.0], ['red', 200, 115, 42.0], ['blue', 20, 110, 80.0]]
near = [r[0] for r in seen if r[3] < 50]
print("near:", near)
print("nearest:", seen[0][0])
```

The task: spot the robot

Print `robot at <cm> cm, bearing <degrees> and dome: <colour>`, both from `robots()`. Do not drive.

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

# every robot in view, nearest first
print(robots())
```

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



Do it on the robot

www.bugbotlab.com/learn/6-4-seeing-other-robots/

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

Challenges

1. Turn until the green robot is centred in the picture, then print your heading.
2. Print the robot's position on the mat, from your position, heading, and its distance and bearing. Hint: `math.sin` and `math.cos`.
3. Flash your own dome red and green alternately every half second while printing what you see.