



4.4 Colour

Name _____

Class _____

Date _____

What this lesson is about

The blob detector: one colour at a time, area and box width as distance.

- Pick a colour
- Which side?
- How far?
- Follow the colour

Questions

7 marks in all

1. A blob is `[cx, cy, area, x0, y0, x1, y1, aspect]`. What is `blob[2]`? [1 mark]

- ☐ A The area, in pixels
- ☐ B The distance, in cm
- ☐ C The left edge of its box
- ☐ D Its colour

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

```
blob = [220, 110, 900, 205, 95, 235, 125, 1.0]
width = blob[5] - blob[3]
print(width)
print("left" if blob[0] < 160 else "right")
```

3. The program has read the red blobs. How does it read the blue ones? [1 mark]

- ☐ A Call `set_cv("blob", "blue")`, then `blobs()` again
- ☐ B Call `blobs("blue")`
- ☐ C Look further down the list from `blobs()`
- ☐ D Call `set_cv("blue")`

4. Why is the box width a better guide to distance than the area? [1 mark]

- ☐ A Area grows with the square of the size, so it changes much faster
- ☐ B Area is always 0 for a ball
- ☐ C Width is measured in cm
- ☐ D Width does not change as the ball gets closer

5. What does this program print?

[1 mark]

```
red = [100, 120, 400, 90, 110, 110, 130, 1.0]
blue = [250, 118, 1600, 230, 98, 270, 138, 1.0]
balls = {"red": red, "blue": blue}
nearer = max(balls, key=lambda name: balls[name][5] - balls[name][3])
print(nearer, "is nearer")
```

6. A blob's box is 60 pixels wide and 20 pixels high. What is its aspect ?

[1 mark]

7. Why does a blob have no distance , when a tag does?

[1 mark]

- ☐ A The detector does not know how big the red thing really is
- ☐ B The camera cannot measure distance at all
- ☐ C Colours are always far away
- ☐ D You have to call distance() inside blobs()

The task: red or blue

Without driving, print left: <colour> and right: <colour> for the two balls.

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

# camera: look for red blobs
set_cv("blob", "red")
print(blobs())
```

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



Do it on the robot

www.bugbotlab.com/learn/4-4-colour/

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

Challenges

1. Print which ball is nearer, using the box width.
2. Drive to the blue ball and stop 10 cm from it, checking with distance() .

3. Look for green and yellow too. What does `blobs()` return when there is nothing of that colour?