



6.6 Bumps and stalls

Seeing more · Robot club · about 20 min

Name _____

Class _____

Date _____

What this lesson is about

bumped(), stalls from velocity, back off and go round.

- bumped()
- Stalls
- Back off, go round
- Wall or robot?

Questions

7 marks in all

1. The robot drives into a 2 cm tall box, but `distance()` never saw it. Why? [1 mark]
 - ☐ A The depth sensor's level rows look straight over the top of it
 - ☐ B The box is the same colour as the mat
 - ☐ C `distance()` only works when the robot is still
 - ☐ D The camera was switched to the line detector
2. Which sensor does `bumped()` use? [1 mark]
 - ☐ A The accelerometer in the IMU, which feels the jolt
 - ☐ B The camera
 - ☐ C The distance sensor
 - ☐ D The optical-flow sensor
3. How does the stall check know the robot is stuck? [1 mark]
 - ☐ A It compares the real speed from `velocity()` with the speed it asked for
 - ☐ B It waits for `bumped()`
 - ☐ C It checks whether `distance()` is under 5
 - ☐ D It counts how long the program has run
4. What does this program print? [1 mark]

```
speeds = [0, 10, 25, 30, 29, 28, 1, 0]
for tick, vy in enumerate(speeds):
    if tick > 5 and vy < 2:
        print("stalled at tick", tick)
        break
```

5. Which of these can a stall check catch that `bumped()` might miss?

[1 mark]

Tick every answer that is true.

- ☐ A A slow push into a wall
- ☐ B Driving off the edge of a table onto nothing
- ☐ C A tag 30 cm ahead
- ☐ D Another robot's LED changing colour

6. Put the states of the bump and back behaviour in the order they run after a bump.

[1 mark]

Number the lines 1 to 4 to put them in the right order.

- ___ `go: drive forward until `bumped()``
- ___ `back: drive backward for a few ticks`
- ___ `side: slide right for a few more ticks`
- ___ `go: carry on forward`

7. After a bump, a tag is right in front of you. What is the polite response?

[1 mark]

- ☐ A It is probably a robot, so wait rather than shove
- ☐ B It is a wall, so back off and go round
- ☐ C Drive harder to push through
- ☐ D Turn the camera off

The task: bump and back

Reach the green zone past a box the depth sensor cannot see, printing `bumped` when you hit it.

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

while position()[1] < 80:
    # drive forward at 60 (keeps going until the next command)
    forward(60)
    # pause 0.1 s (the robot keeps doing what it was told)
    wait(0.1)
# all motors off
stop()
```

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



Do it on the robot

www.bugbotlab.com/learn/6-6-bumps-and-stalls/

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

Challenges

1. Count the bumps and print the total at the end.
2. Use the stall check instead of `bumped()` and see which reacts first.
3. After the bump, sidestep only until `distance()` in the level rows shows the way is clear.