Valiant Robot

Driving robots

and

Programming a robot to avoid obstacles

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Connecting and Downloading to Robot:

- **Step 1: Copy and paste your text code into Arduino IDE.**
- **Step 2: Plug your Valiant into the computer.**
- **Step 3: Click on the tick in the top left to 'compile' code.**
- **Step 4: Click on the circle with a → arrow to upload the code to the robot.**

- ***Note:*** *You can also use the magnifying glass icon (top right) to see the serial-monitor whilst the robot is connected to the computer.*
  MAKE SURE THE ROBOT WILL NOT RUN OFF THE TABLE!

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IMPORTANT: Disconnect your robot and put it on the floor before turning it on

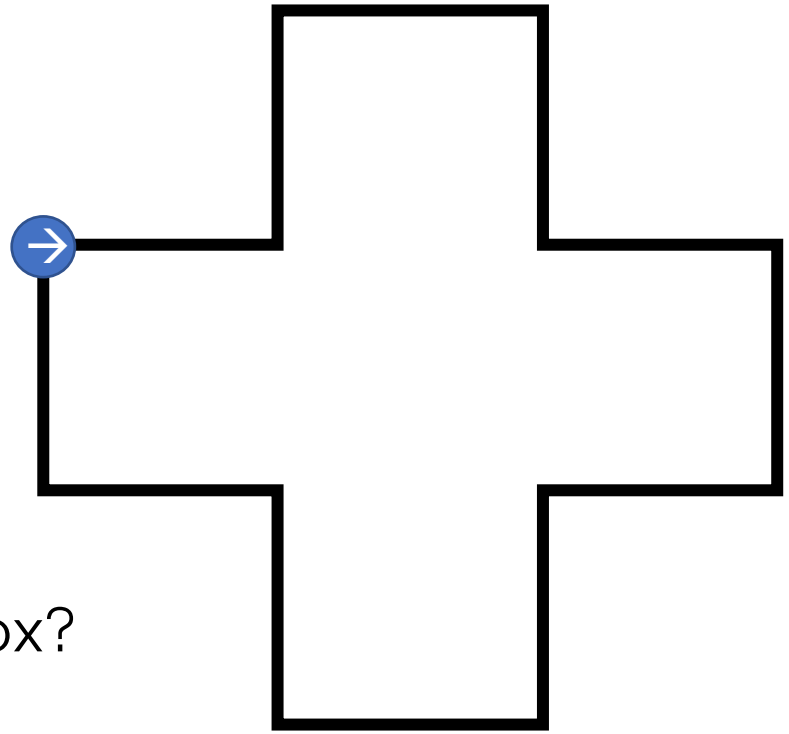
BRONZE Challenge:

- **Get your robot to perform the following sequence of actions in a loop:**
  - Drive forward for 1000ms
  - Drive backwards for 1000ms
  - Turn left for 500ms
  - Turn right for 1000ms
  - Turn left for 500ms
  - Turn the LED on
  - Turn servo to 10° - how long does this take to complete?
  - Turn servo to 170°
  - Turn servo to 90°
  - Turn the LED off
- **Does your robot return to where it started from?**

SILVER Challenge:

Drawing a shape:

- To draw the shape on the right, you need to work out how long it takes to turn 90°
- The shape can be produced by repeating the following sequence 4 times:
  - Forward, Left 90°, Forward, Right 90°, Forward, Right 90°
- Can you get your robot back to the starting box?



GOLD Challenge:

Obstacle avoiding robot

Using the ultrasonic sensor, have your robot drive around the room on it's own, avoiding obstacles.

You will need to think about distance of detection, which way to turn, and how to continue moving.

Remember, the ultrasonic sensor is quite high on the robot, meaning it might not see lower obstacles.

Extension Challenges

- Add sounds using tones on the piezo to changes in direction. Different ones for each movement will allow you to hear what it will do next.

- Use the LDR sensor on the robot to head towards a light whilst still avoiding obstacles.