The NONI Activity Book for STEAM Education (Level 1)

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Activity Outline

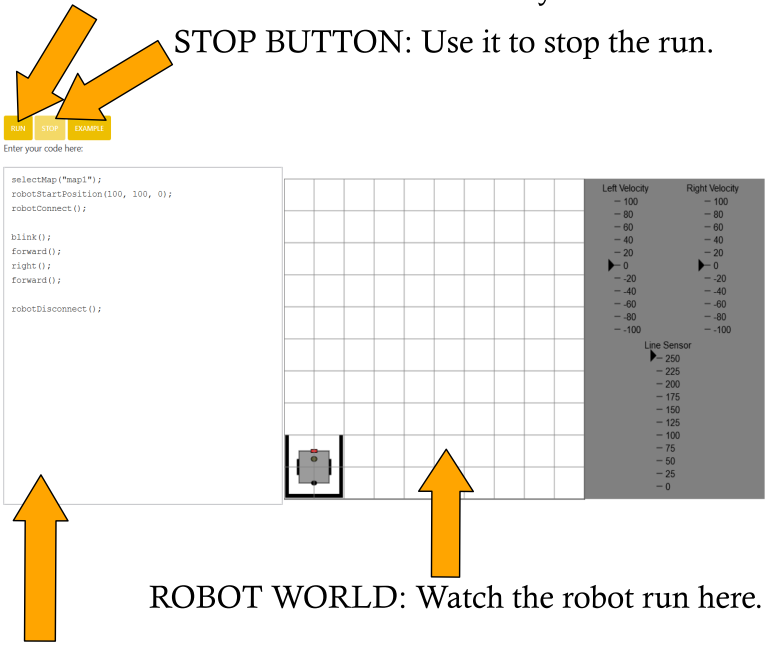
The activities in this book are grouped according to the learning concepts below. Many activity groups use learning concepts from previous activity groups. For the best learning experience, work through the activities in the order listed.

- Getting started (Activity 1-2)
- Changing maps (Activity 3-6)
- Coordinate systems, x coordinates (Activity 7-10)
- Coordinate systems, y-coordinates (Activity 11-14)
- Coordinate systems, general (Activity 15-19)
- Angles (Activity 20-23)
- Placing the robot on a map (Activity 24-29)
- Blink action (Activity 30-32)
- Drive actions, basic (Activity 33-40)
- Drive actions, advanced (Activity 41-48)
- Maze activities (Activity 49-52)
- Paint activities, basic (Activity 53-58)
- Paint activities, advanced (Activity 59-64)
- Bonus robot activity, repetition and looping (Activity 65)

Activity 1

Let’s learn a little bit about how to play with the NONI Robot.

- Open a web browser on your computer.
- In the address bar, type in the URL: www.nonirobot.com
- In the code area or the left, type in your code instructions.
- Once you are done typing in your code, make sure your spelling and capitalization is correct.
- Don’t forget the “;” at the end of each command.
- Now press the “Run” button at the top.
- The robot will start following your code instructions in the robot world on the right.
- The robot world may not be visible if this is the first time you are typing in code instructions.
- To modify your code instructions, make sure your robot is done following your code instructions.
- You can press the “Stop” button any time to stop the robot.



```
selectMap("map1");
robotStartPosition(100, 100, 0);
robotConnect();

blink();
forward();
right();
forward();

robotDisconnect();
```

RUN BUTTON: Use it to make your robot run.

STOP BUTTON: Use it to stop the run.

ROBOT WORLD: Watch the robot run here.

CODE AREA: Type in code for the robot here.

Activity 2

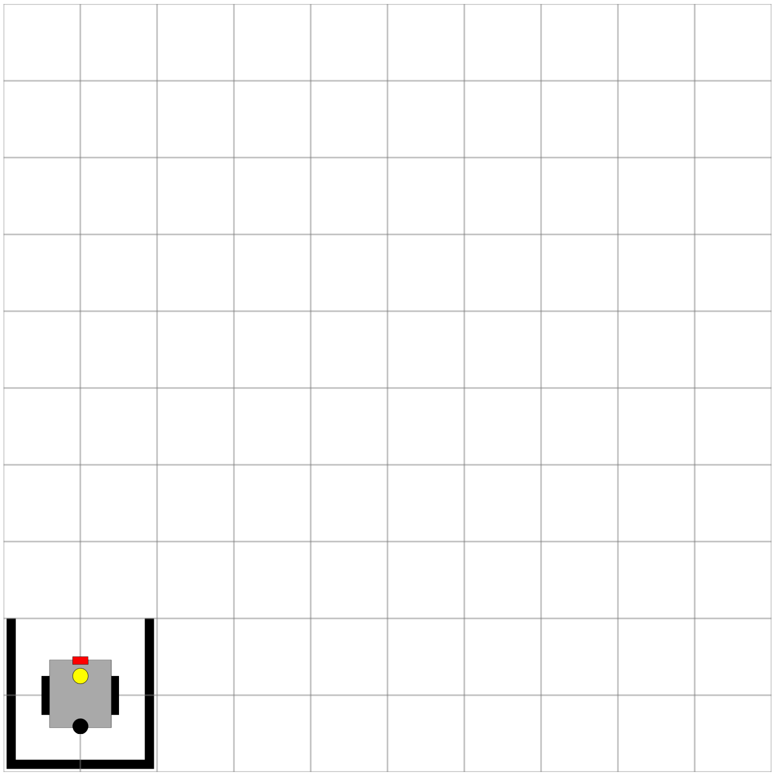
Let’s place the robot on map 1. For that, we will use:
selectMap(“map1”);

Make sure you type in “map1” without a space, and NOT “map 1” which has a space. Next, we will place the robot at a start position of x=100, y=100, and angle=0. This is done in the format:
robotStartPosition(x, y, angle);

So following that format, we will use:
robotStartPosition(100, 100, 0);

The last thing to do is make sure we connect and disconnect with the robot.

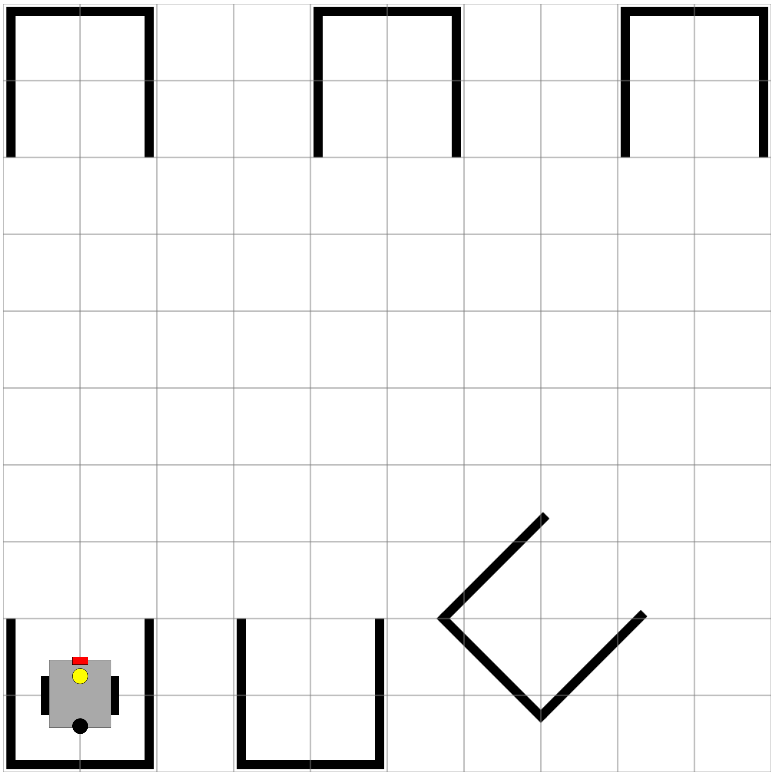
Type in the code instructions exactly as below and press the “Run” button.



```
selectMap("map1");
robotStartPosition(100, 100, 0);
robotConnect();

robotDisconnect();
```

Activity 3

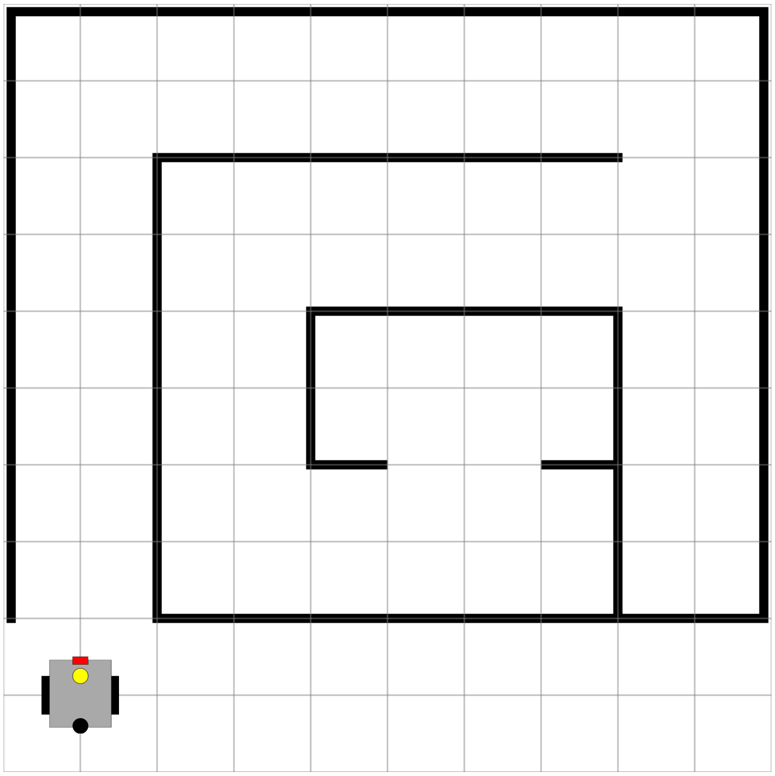
Now let's try placing the robot on map 2. Complete the code instructions below and then try them out with NONI robot.



```
selectMap("____________________");
robotStartPosition(100, 100, 0);
robotConnect();

robotDisconnect();
```

Activity 4

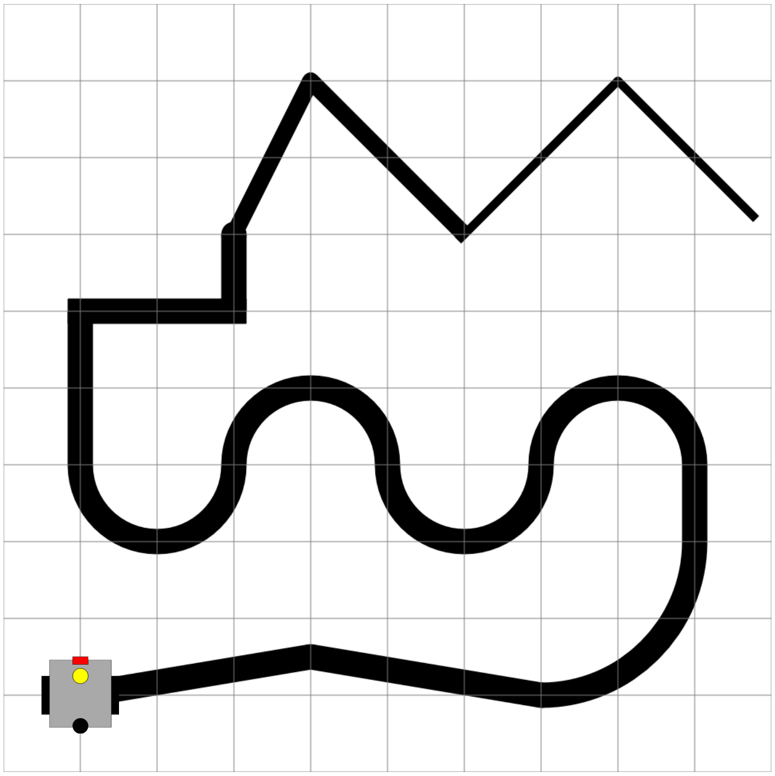
Next, let’s try placing the robot on map 3. Complete the code instructions below and then try them out with NONI robot.



```
selectMap("__________________");
robotStartPosition(100, 100, 0);
robotConnect();

robotDisconnect();
```

Activity 5

Let’s try placing the robot on map 4. Complete the code instructions below and then try them out with NONI robot.



```
selectMap("____________________");
robotStartPosition(100, 100, 0);
robotConnect();

robotDisconnect();
```

Activity 6

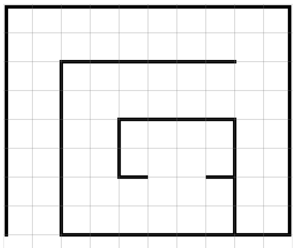
Now that you have tried out the different maps, match the map numbers below to the correct map images.

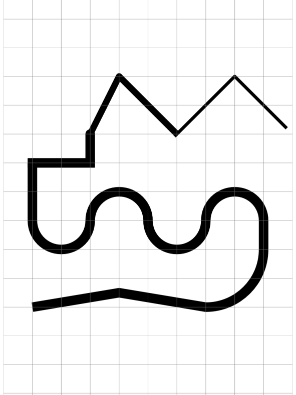
map1

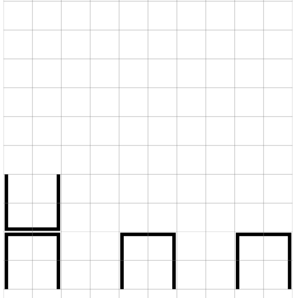
map2

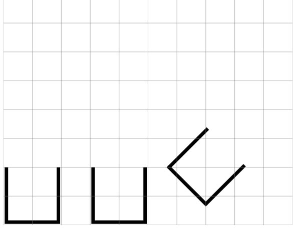
map3

map4



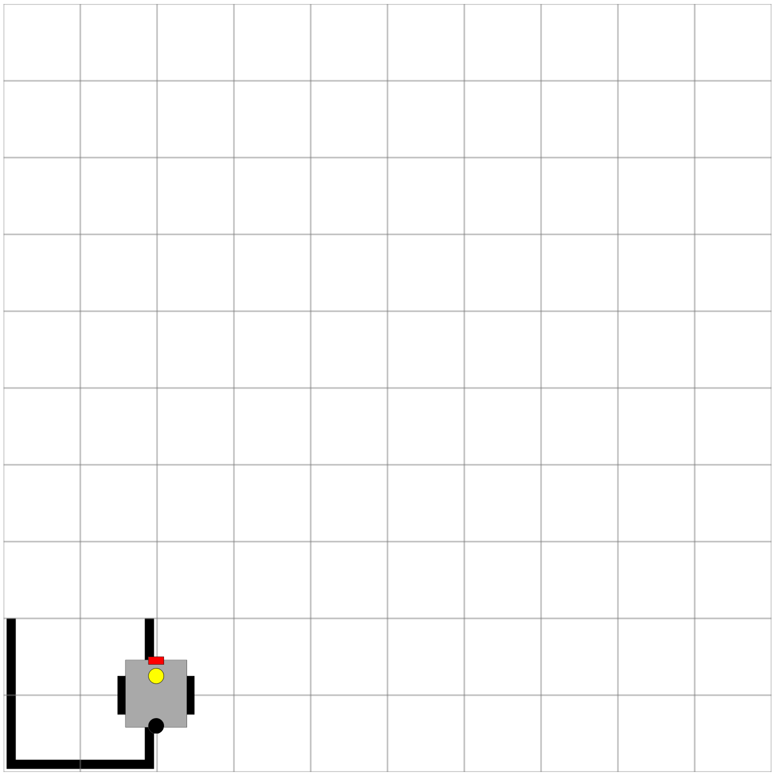






Activity 7

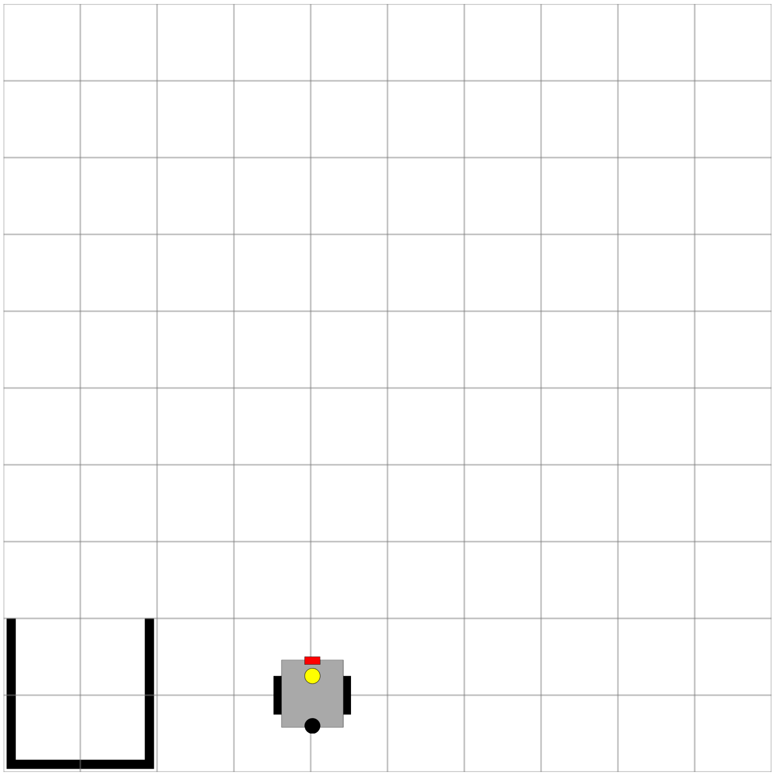
Complete the code below. Try it out with the NONI robot. Hint: x=200.



```
selectMap("map1");
robotStartPosition(________, 100, 0);
robotConnect();

robotDisconnect();
```

Activity 8

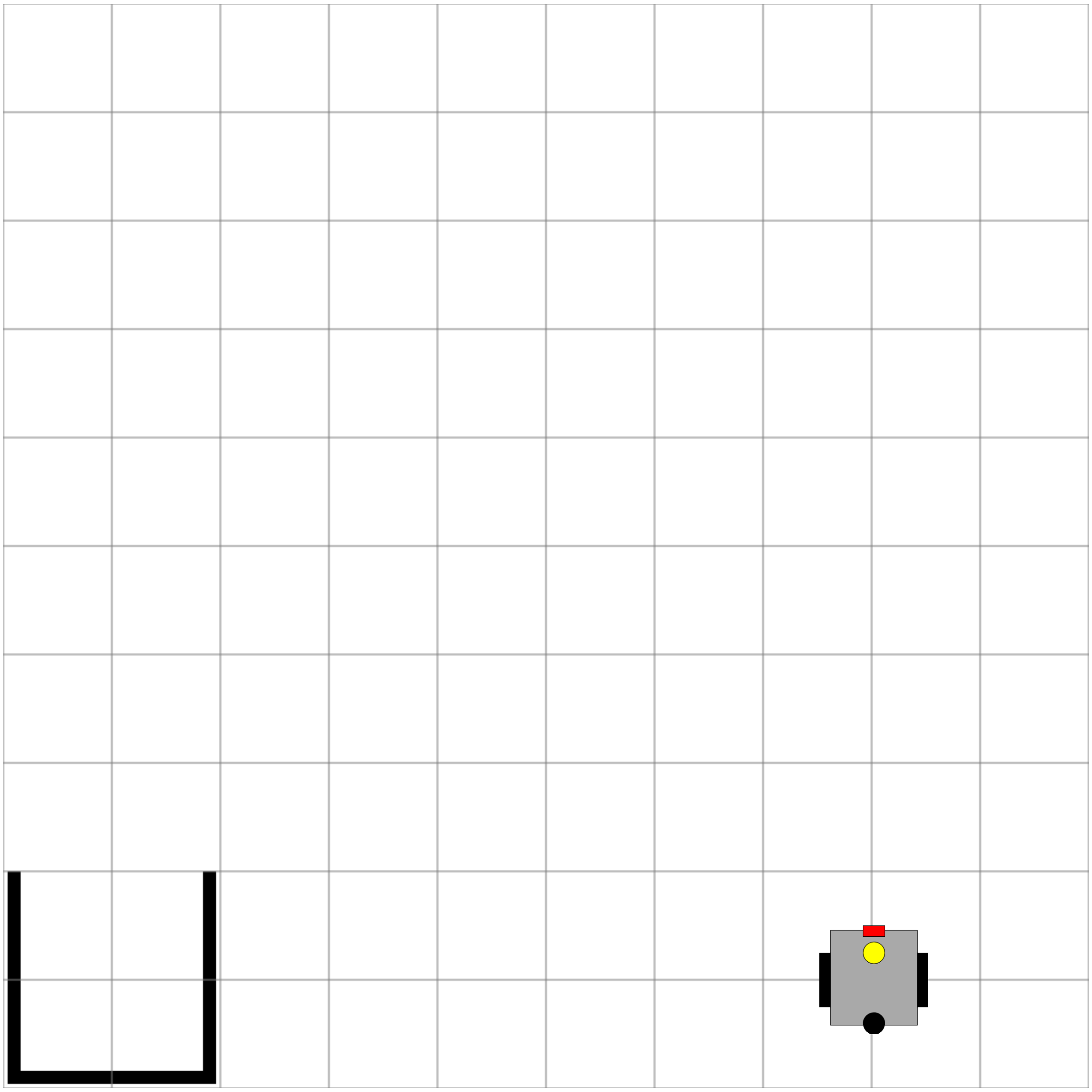
Complete the code below. Try it out with the NONI robot.



```
selectMap("map1");
robotStartPosition(_________, 100, 0);
robotConnect();

robotDisconnect();
```

Activity 9

Complete the code below. Try it out with the NONI robot.

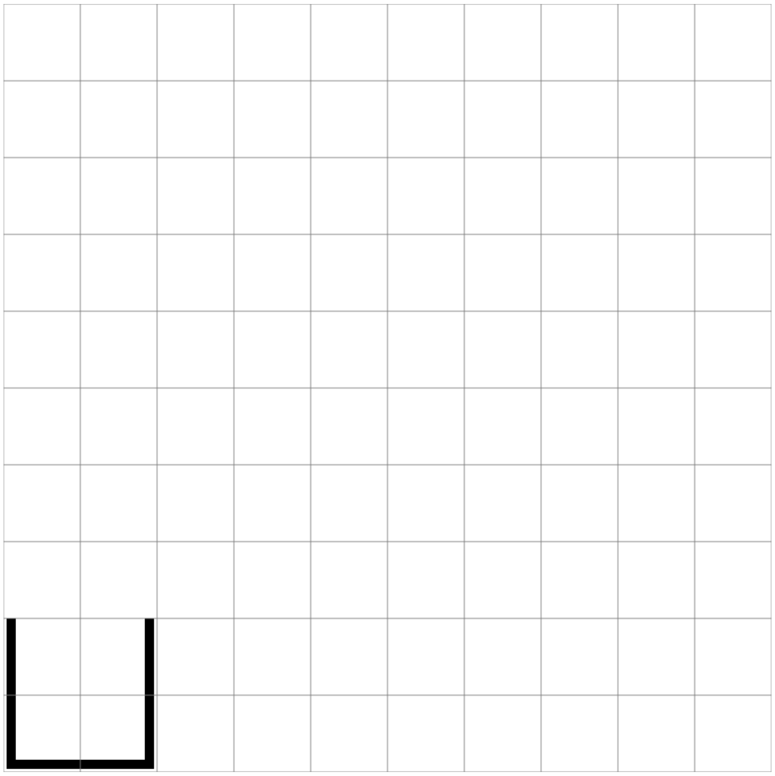


```
selectMap("map1");
robotStartPosition(_________, 100, 0);
robotConnect();

robotDisconnect();
```

Activity 10

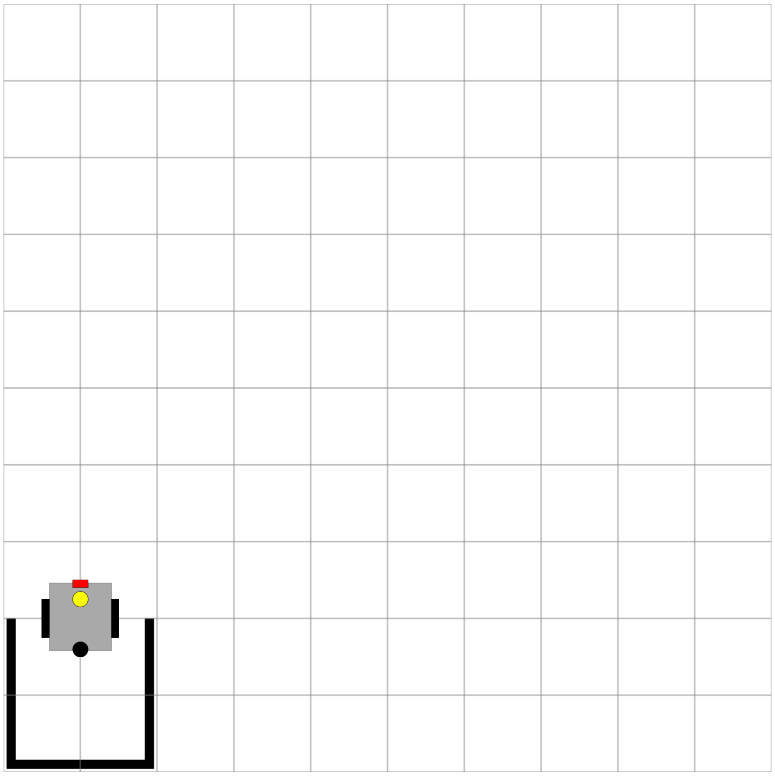
Given the code below, where will the robot be? Draw it on the map below. Then try it out with the NONI Robot.

```
selectMap("map1");
robotStartPosition(500, 100, 0);
robotConnect();

robotDisconnect();
```



Activity 11

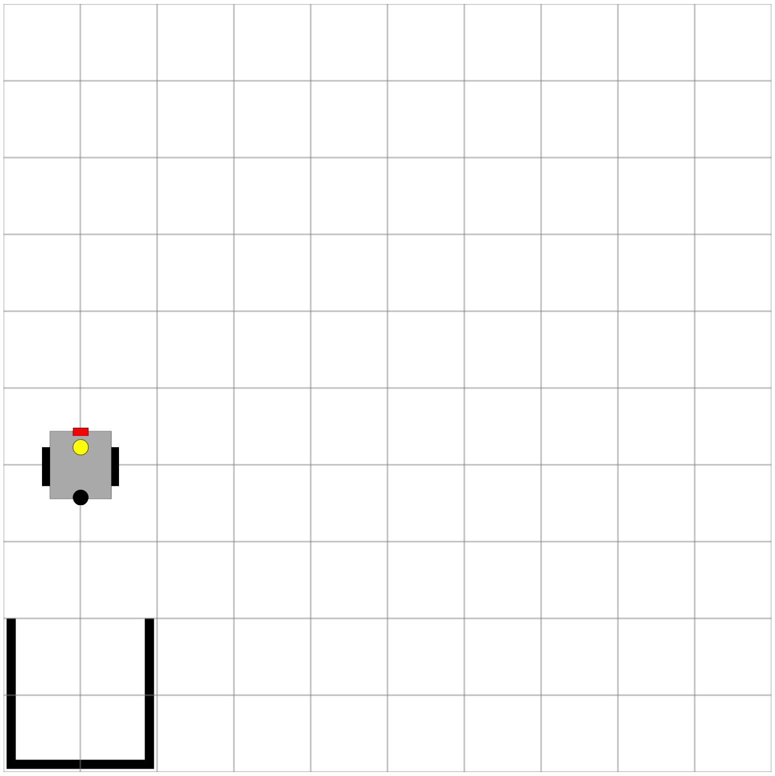
Complete the code below. Try it out with the NONI robot. Hint: y=200.



```
selectMap("map1");
robotStartPosition(100, ________, 0);
robotConnect();

robotDisconnect();
```

Activity 12

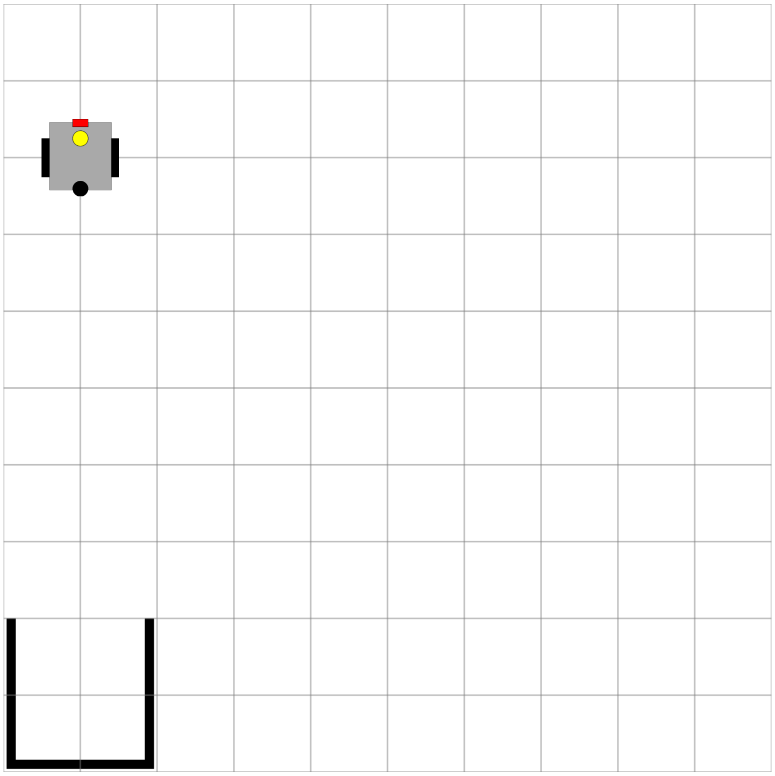
Complete the code below. Try it out with the NONI robot.



```
selectMap("map1");
robotStartPosition(100, _________, 0);
robotConnect();

robotDisconnect();
```

Activity 13

Complete the code below. Try it out with the NONI robot.

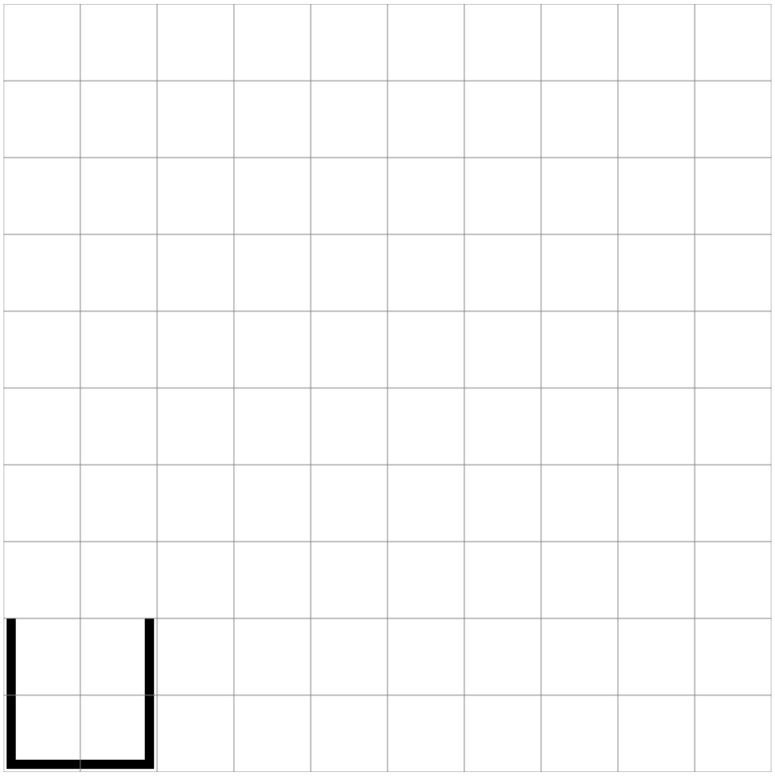


```
selectMap("map1");
robotStartPosition(100, ________, 0);
robotConnect();

robotDisconnect();
```

Activity 14

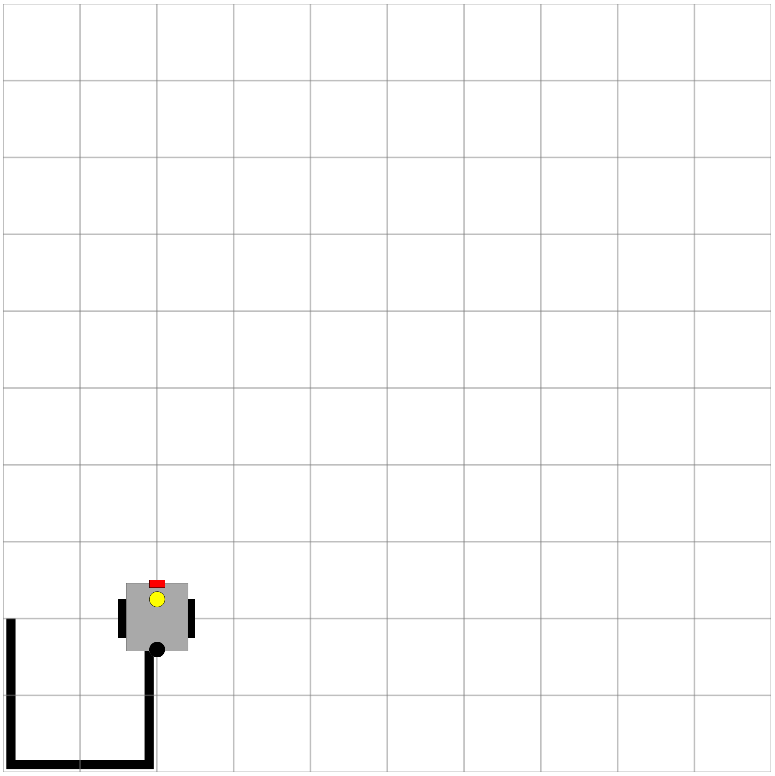
Given the code below, where will the robot be? Draw it on the map below. Then try it out with the NONI Robot.

```
selectMap("map1");
robotStartPosition(100, 500, 0);
robotConnect();

robotDisconnect();
```



Activity 15

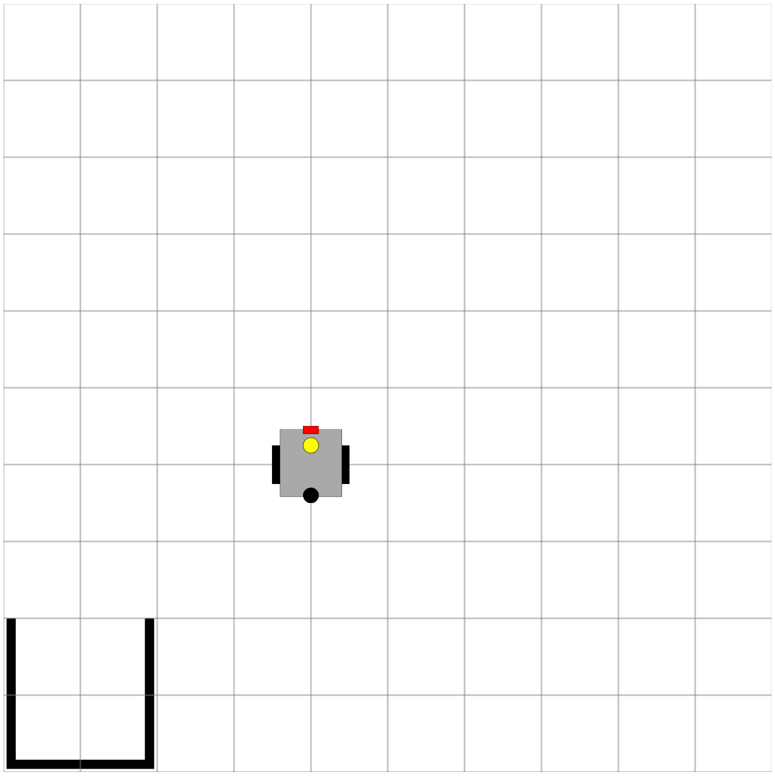
Complete the code below. Try it out with the NONI robot. Hint: x=200, y=200.



```
selectMap("map1");
robotStartPosition(________, ________, 0);
robotConnect();

robotDisconnect();
```

Activity 16

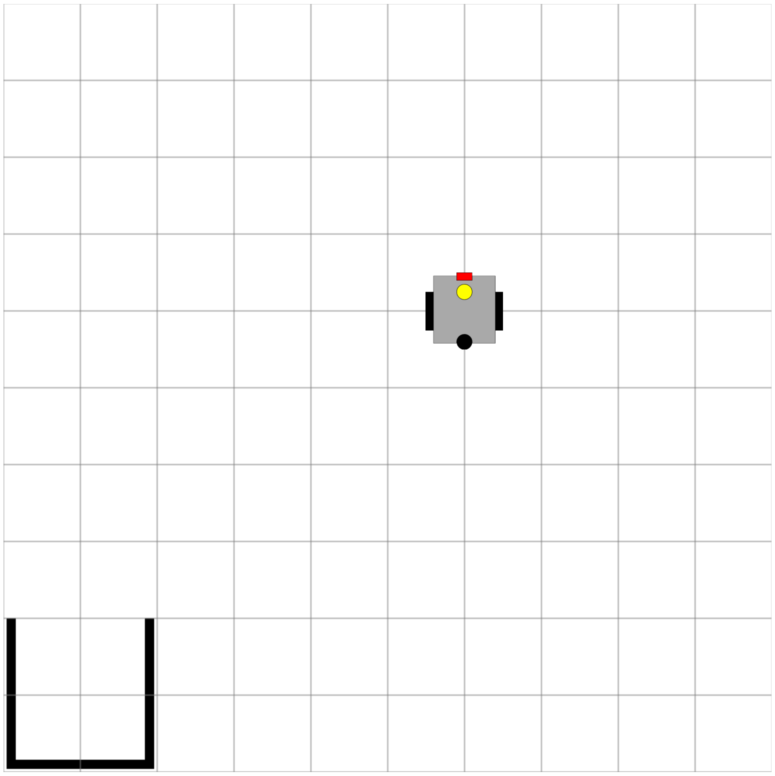
Complete the code below. Try it out with the NONI robot.



```
selectMap("map1");
robotStartPosition(_________, _________, 0);
robotConnect();

robotDisconnect();
```

Activity 17

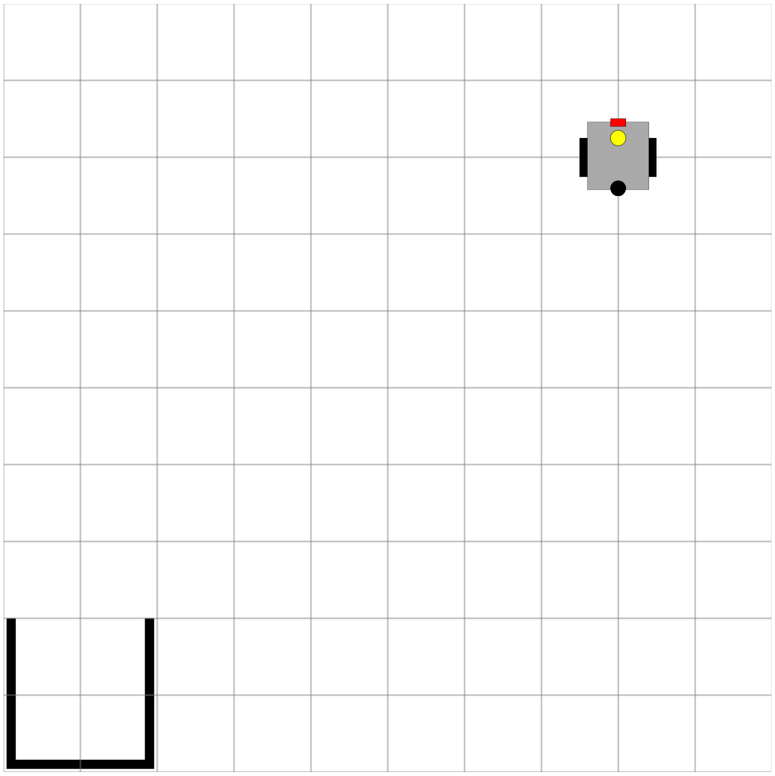
Complete the code below. Try it out with the NONI robot.



```
selectMap("map1");
robotStartPosition(________, ________, 0);
robotConnect();

robotDisconnect();
```

Activity 18

Complete the code below. Try it out with the NONI robot.

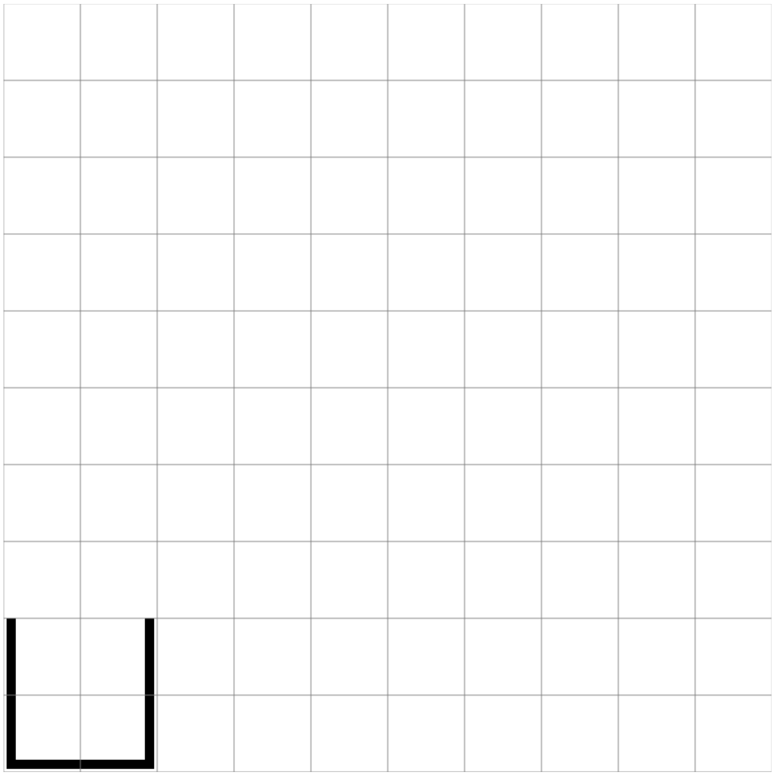


```
selectMap("map1");
robotStartPosition(_________, _________, 0);
robotConnect();

robotDisconnect();
```

Activity 19

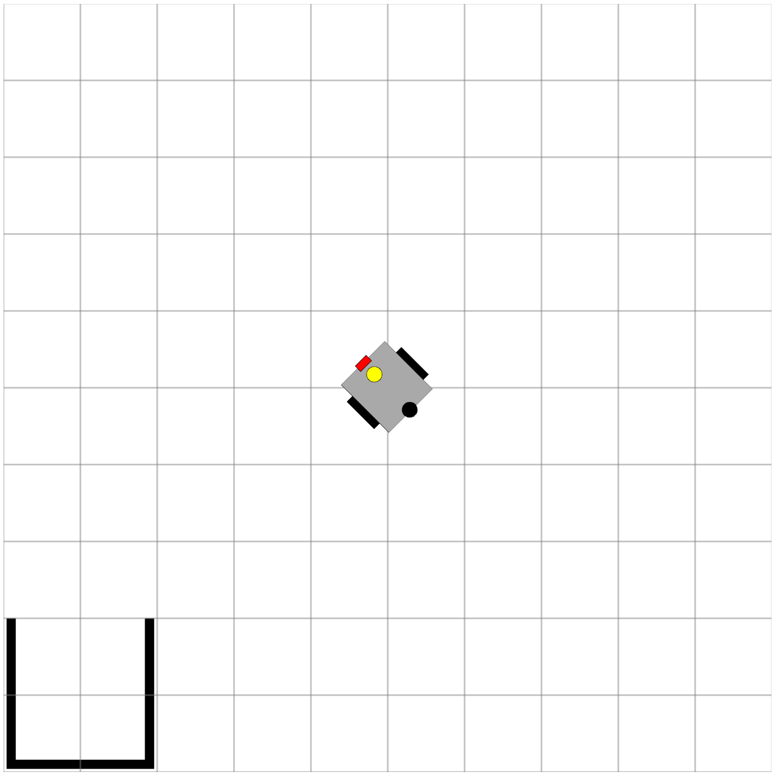
Given the code below, where will the robot be? Draw it on the map below. Then try it out with the NONI Robot.

```
selectMap("map1");
robotStartPosition(500, 500, 0);
robotConnect();

robotDisconnect();
```



Activity 20

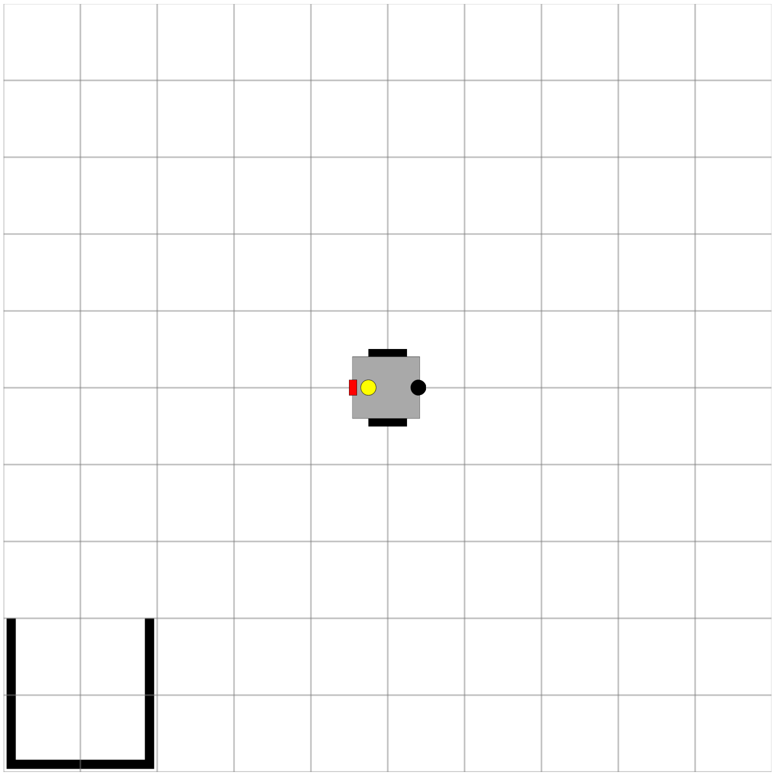
Complete the code below. Try it out with the NONI robot. Hint: angle.



```
selectMap("map1");
robotStartPosition(500, 500, ________);
robotConnect();

robotDisconnect();
```

Activity 21

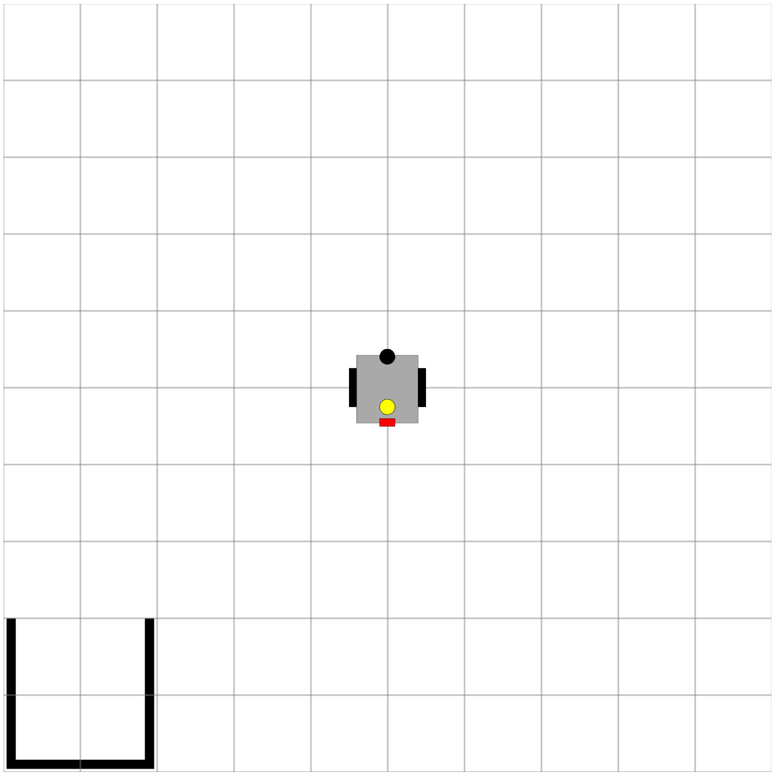
Complete the code below. Try it out with the NONI robot. Hint: angle.



```
selectMap("map1");
robotStartPosition(500, 500, ________);
robotConnect();

robotDisconnect();
```

Activity 22

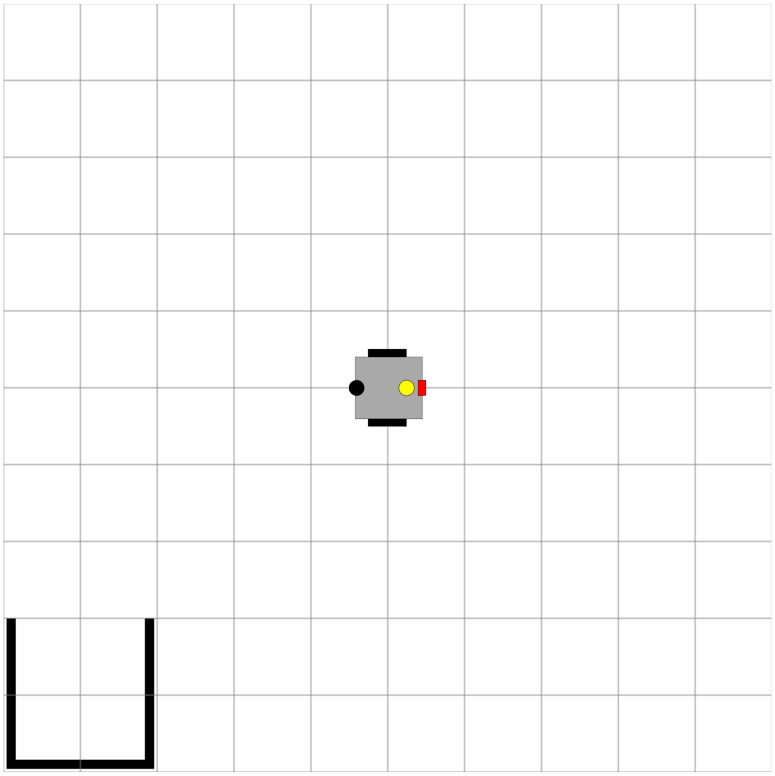
Complete the code below. Try it out with the NONI robot.



```
selectMap("map1");
robotStartPosition(500, 500, ________);
robotConnect();

robotDisconnect();
```

Activity 23

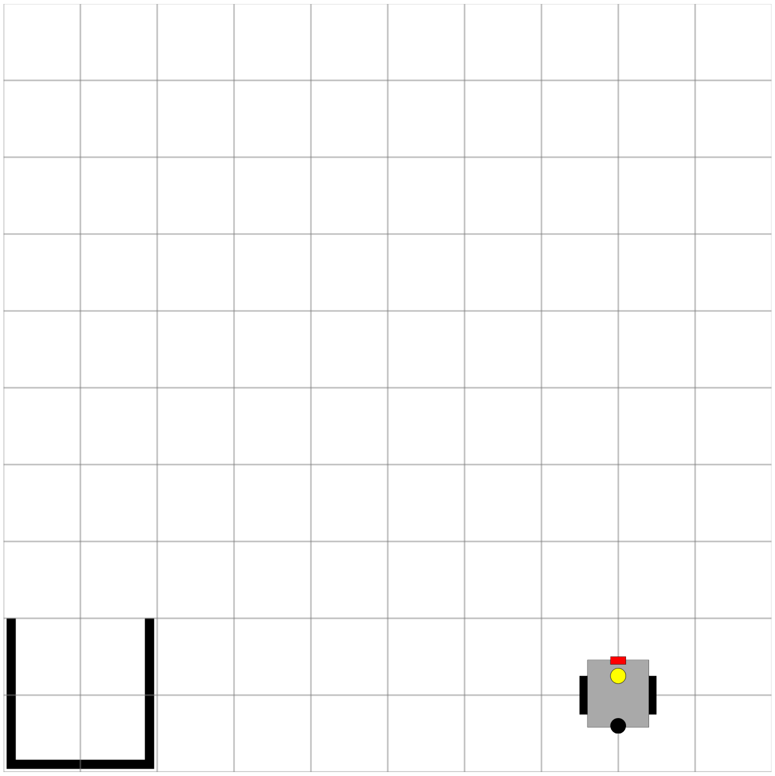
Complete the code below. Try it out with the NONI robot.



```
selectMap("map1");
robotStartPosition(500, 500, ________);
robotConnect();

robotDisconnect();
```

Activity 24

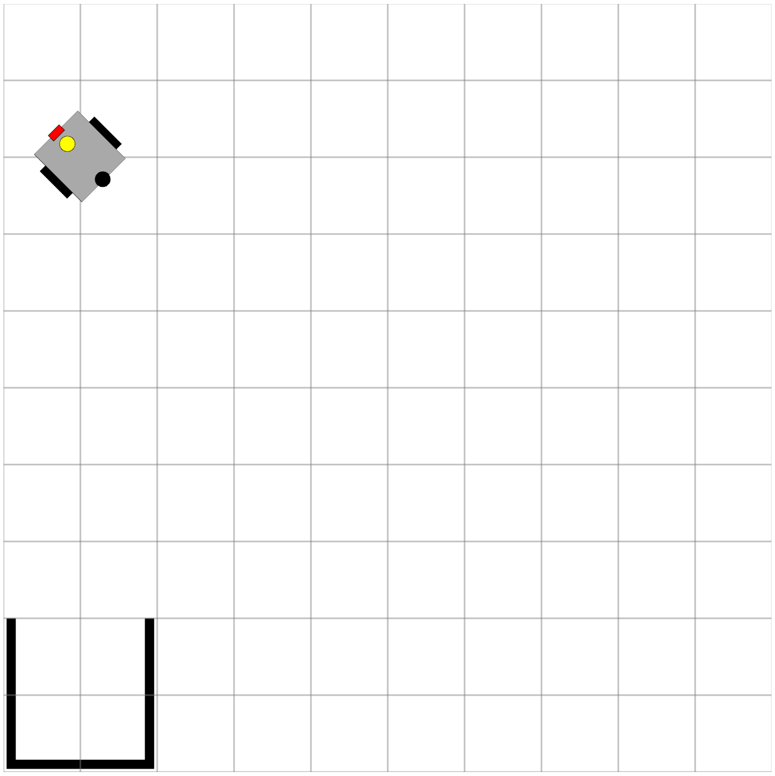
Complete the code below. Try it out with the NONI robot. Hint: x=800, y=100, angle=0.



```
selectMap("map1");
robotStartPosition(_________, _________, _________);
robotConnect();

robotDisconnect();
```

Activity 25

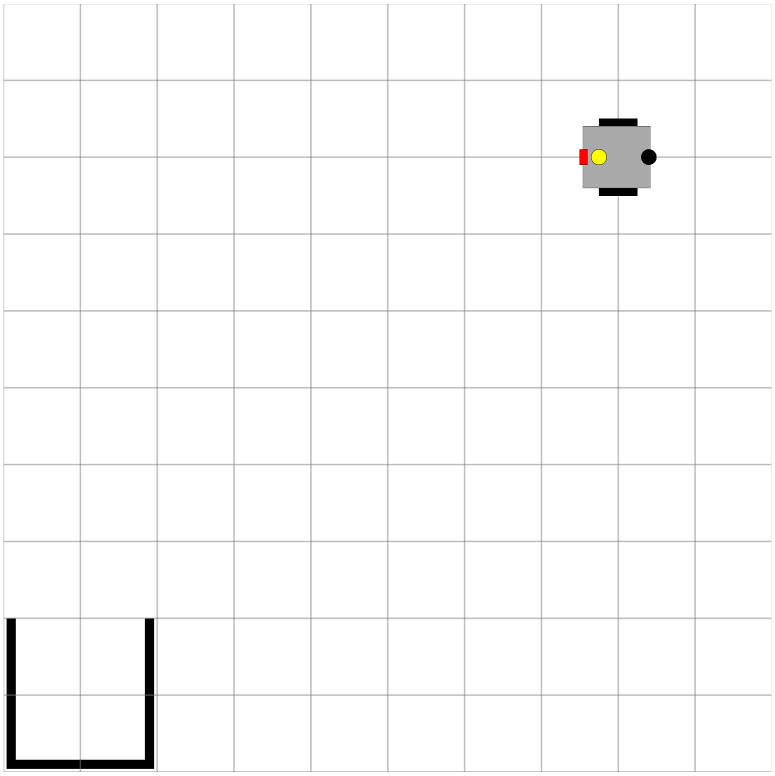
Complete the code below. Try it out with the NONI robot.



```
selectMap("map1");
robotStartPosition(________, ________, ________);
robotConnect();

robotDisconnect();
```

Activity 26

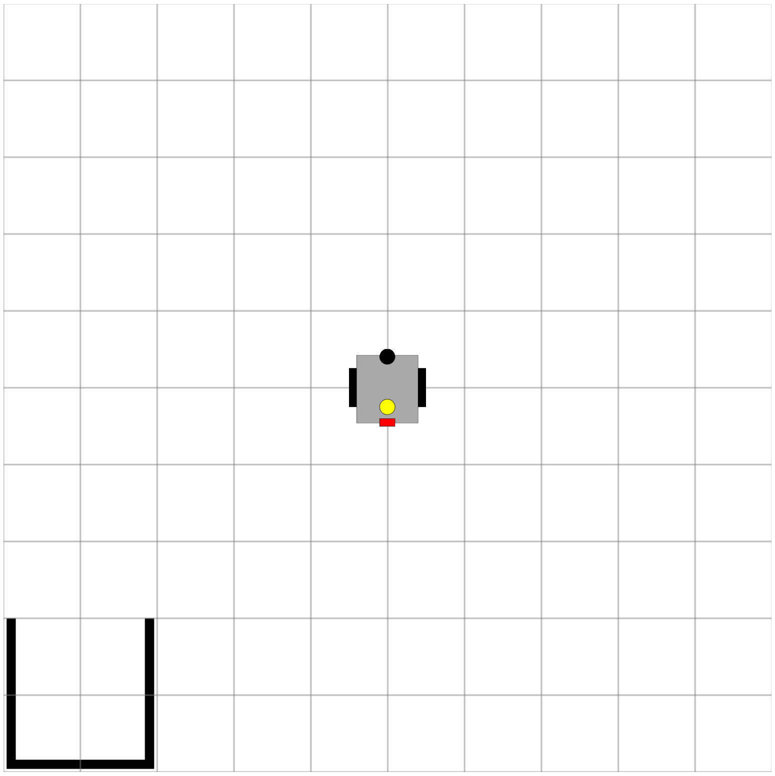
Complete the code below. Try it out with the NONI robot.



```
selectMap("map1");
robotStartPosition(_________, _________, _________);
robotConnect();

robotDisconnect();
```

Activity 27

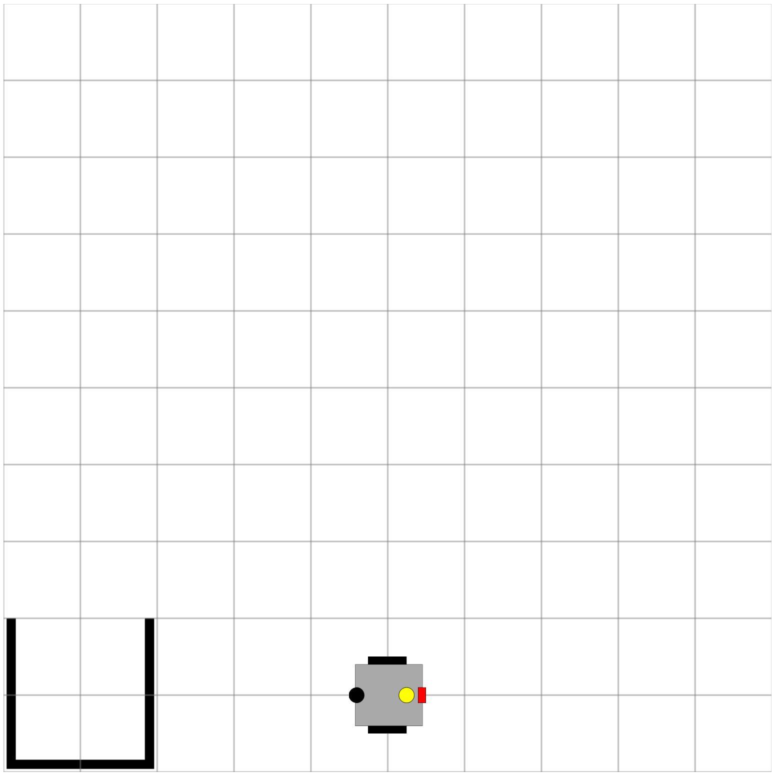
Complete the code below. Try it out with the NONI robot.



```
selectMap("map1");
robotStartPosition(_________, _________, _________);
robotConnect();

robotDisconnect();
```

Activity 28

Complete the code below. Try it out with the NONI robot.

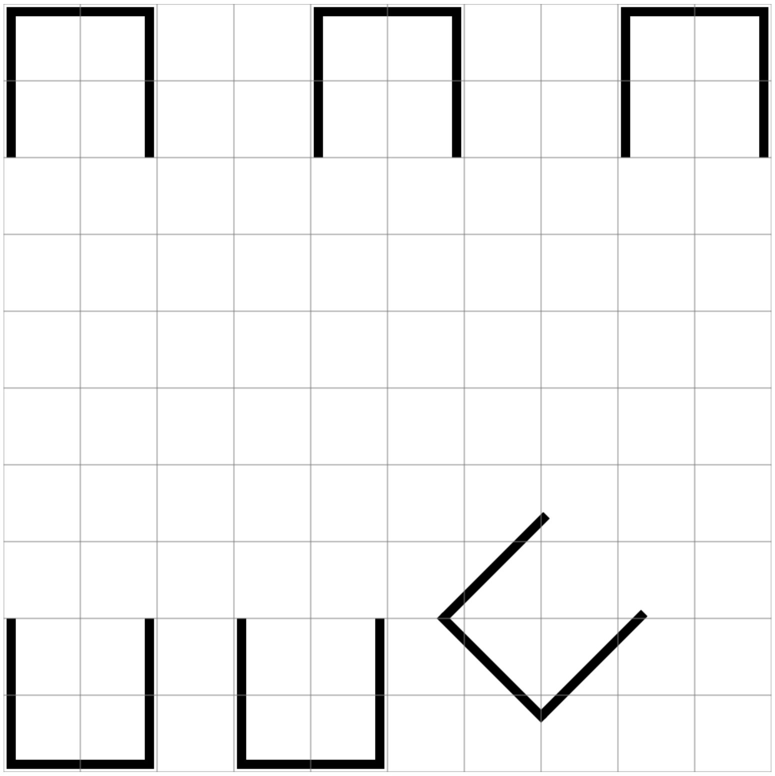


```
selectMap("map1");
robotStartPosition(_________, _________, _________);
robotConnect();

robotDisconnect();
```

Activity 29

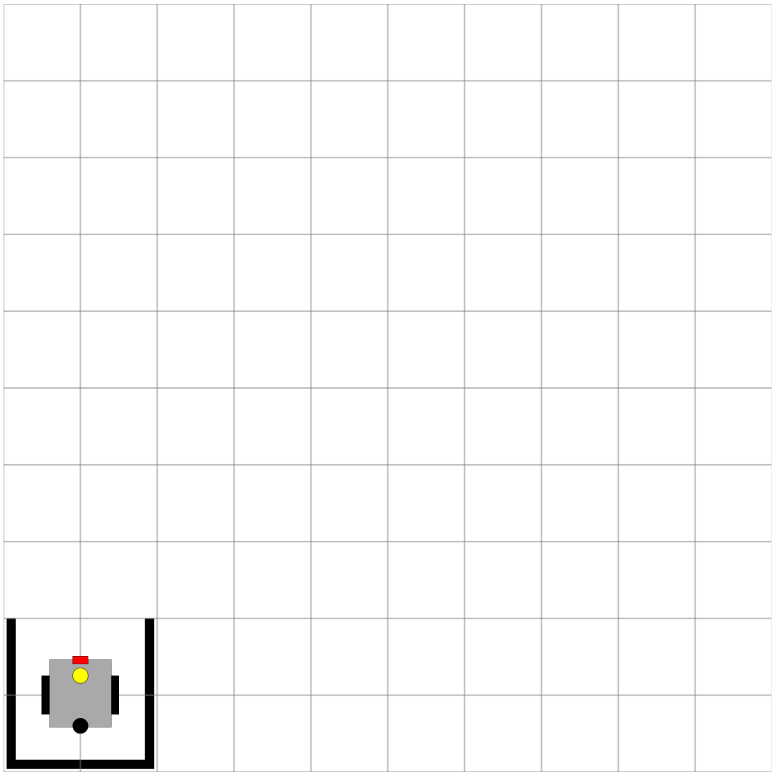
Given the code below, where will the robot be? What is x? What is y? What is the angle? Draw it on the map below. Then try it out with the NONI Robot.

```
selectMap("map2");
robotStartPosition(900, 200, 90);
robotConnect();

robotDisconnect();
```



Activity 30

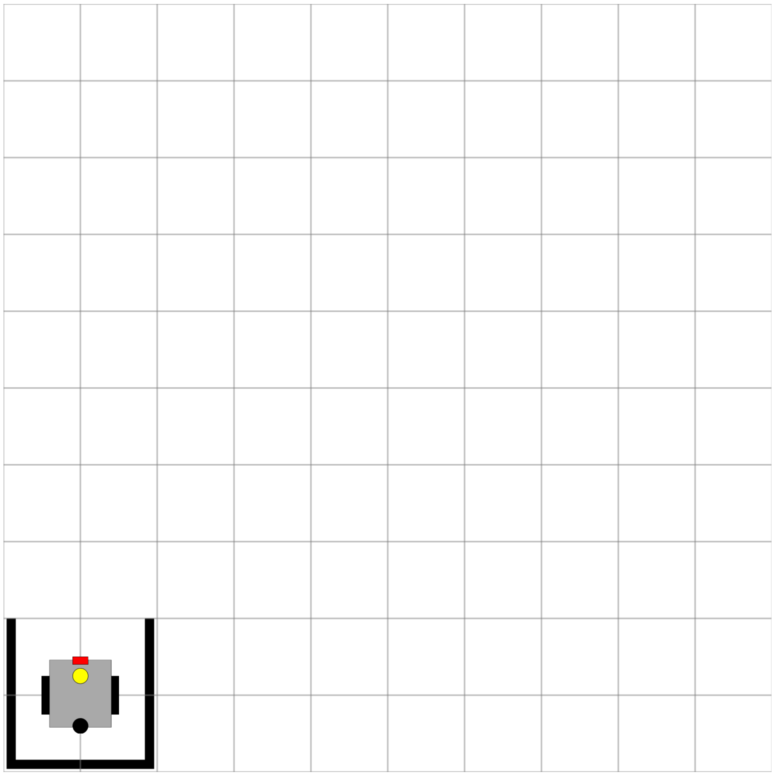
Let’s get started with the action commands. Here is an example of using the “blink” action once. Complete the code below based on the position and angle shown on the map. Try it out with the NONI Robot.



```
selectMap("map1");
robotStartPosition(_________, _________, _________);
robotConnect();

blink();

robotDisconnect();
```

Activity 31

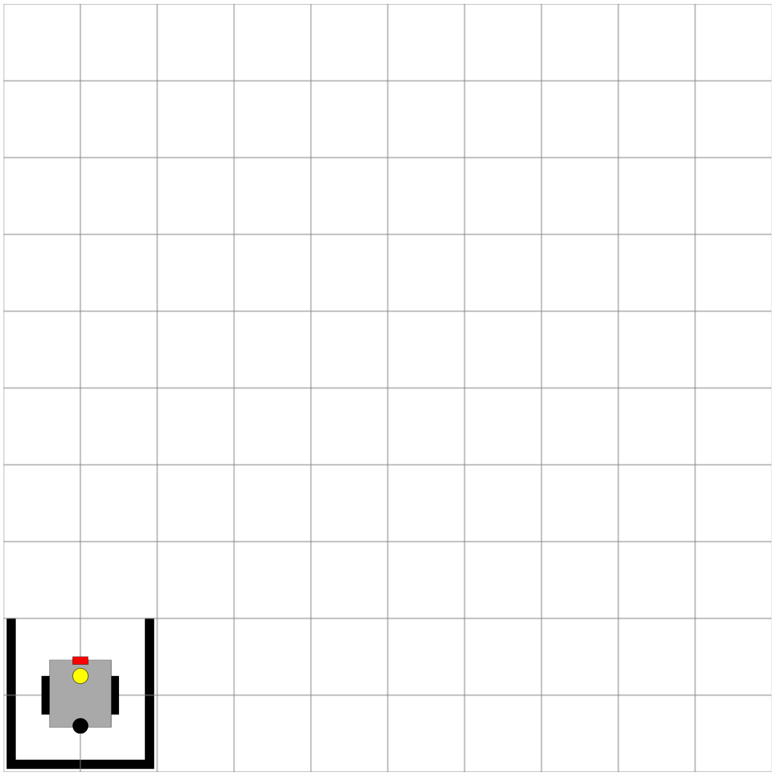
Here is an example of using the "blink" action twice. Complete the code below based on the position and angle shown on the map. Try it out with the NONI Robot.



```
selectMap("map1");
robotStartPosition(________, ________, ________);
robotConnect();

blink();
blink();

robotDisconnect();
```

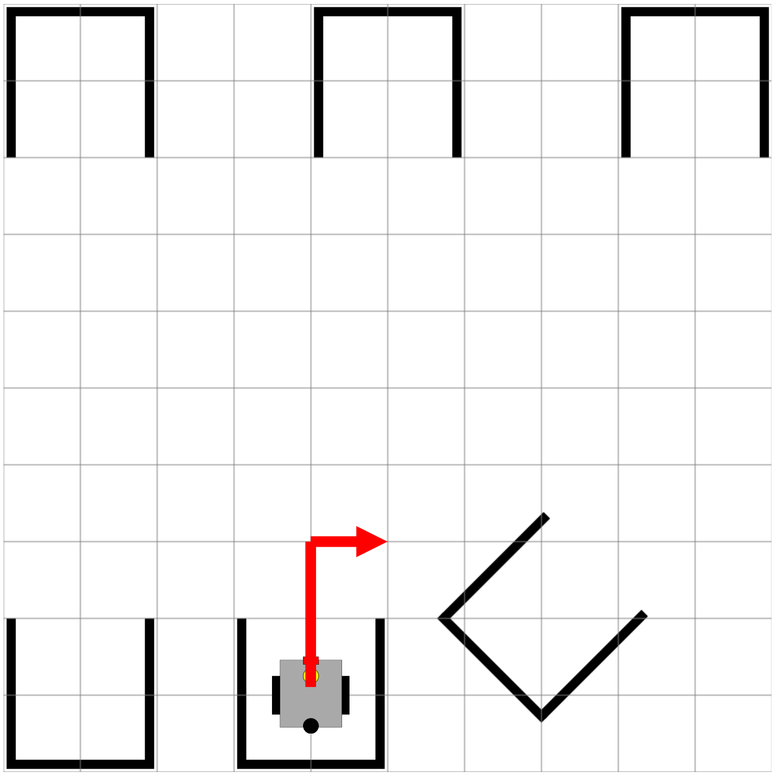
Activity 32

Now make the robot do the “blink” action three times. Write down your code below. Try it out with the NONI Robot.



Activity 33

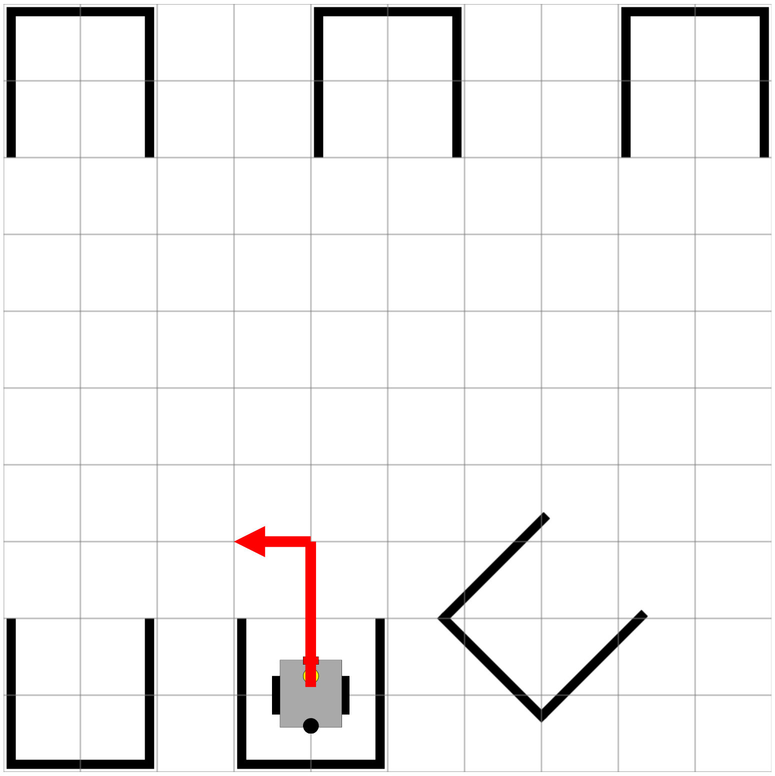
Now, let’s do some driving actions to follow the path below. We will do the “forward” action and the “right” action. Try out the code with the NONI Robot.



```
selectMap("map2");
robotStartPosition(400, 100, 0);
robotConnect();

forward();
forward();
right();
forward();

robotDisconnect();
```

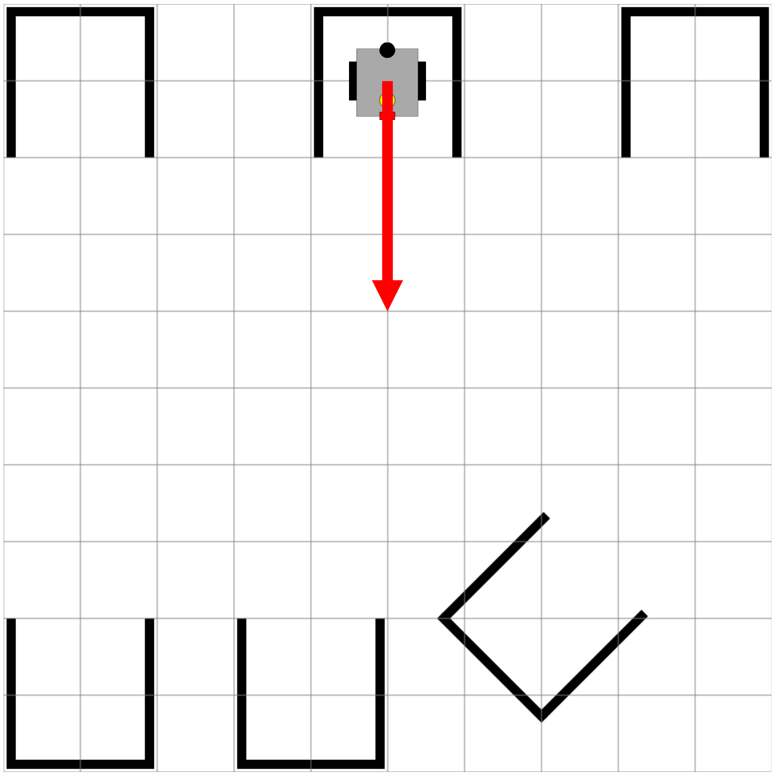
Activity 34

Now make the robot follow the path shown. Write down your code below. Try it out with the NONI Robot.



Activity 35

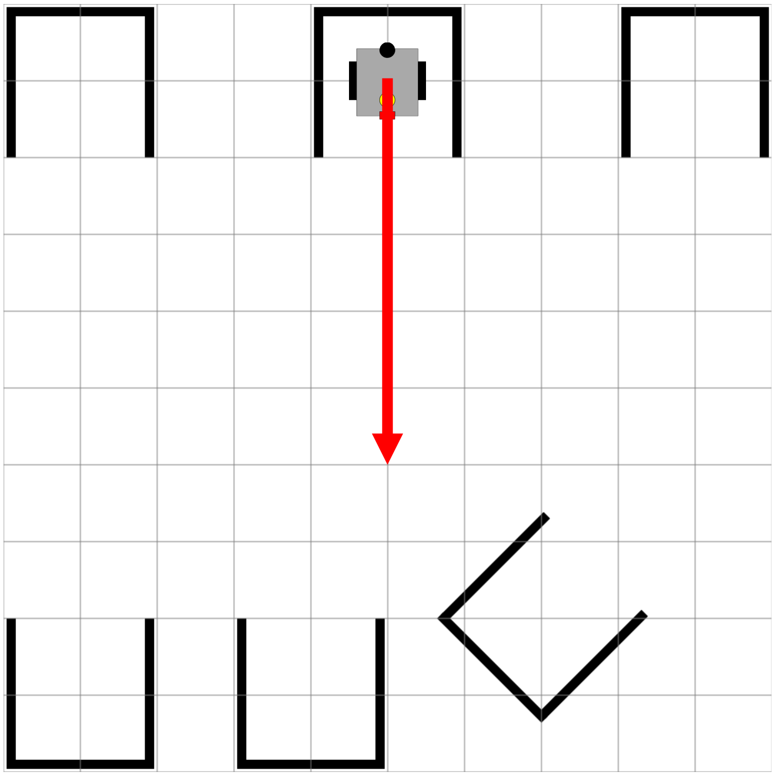
Here is another example for driving. Look at the path on the map below. It requires the "forward" action three times. Try out the code with the NONI Robot.



```
selectMap("map2");
robotStartPosition(500, 900, 180);
robotConnect();

forward();
forward();
forward();

robotDisconnect();
```

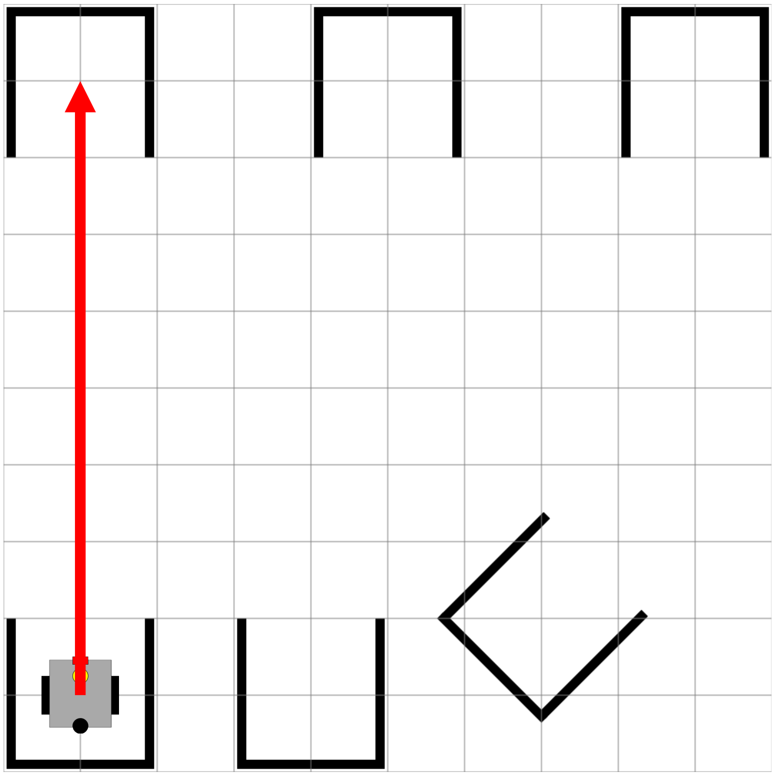
Activity 36

Now make the robot follow the path shown. Write down your code below. Try it out with the NONI Robot.



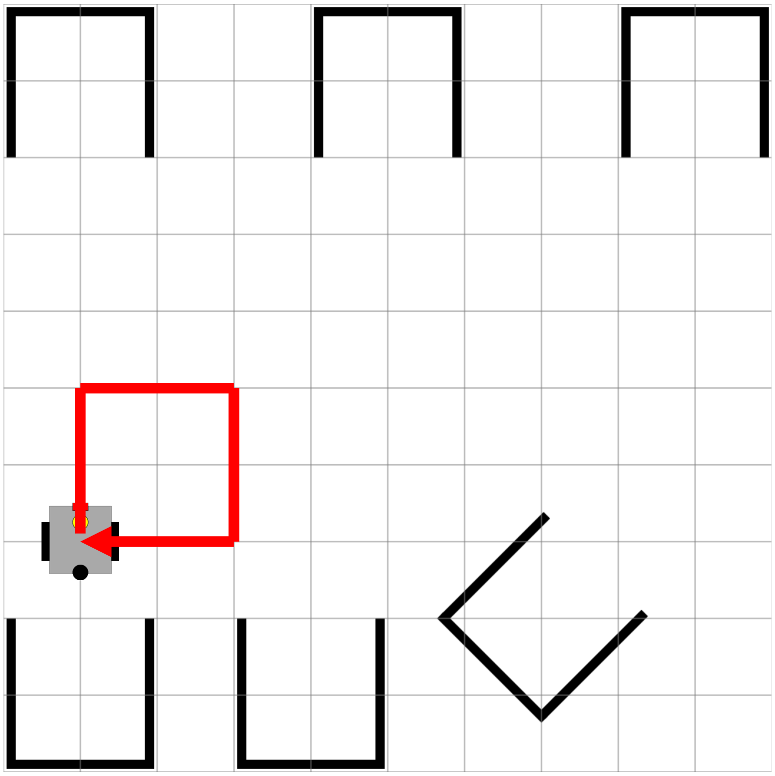
Activity 37

Make the robot follow the path shown. Write down your code below. Try it out with the NONI Robot.



Activity 38

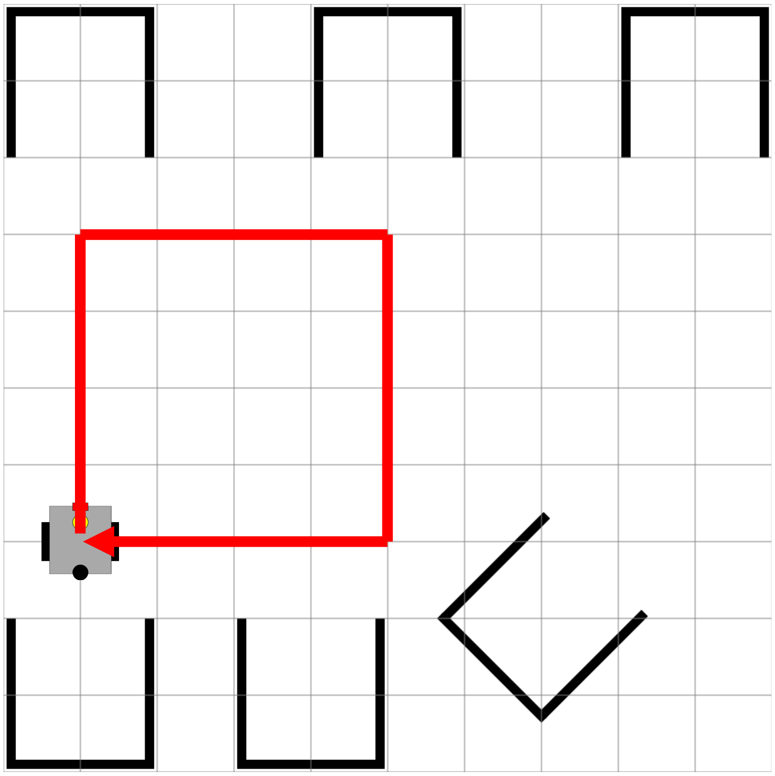
Here is another example for driving. Look at the path on the map below. It requires the robot to drive in a square-shaped path. Try out the code with the NONI Robot.



```
selectMap("map2");
robotStartPosition(100, 300, 0);
robotConnect();

forward();
forward();
right();

forward();
forward();
right();

forward();
forward();
right();

forward();
forward();

robotDisconnect();
```

Activity 39

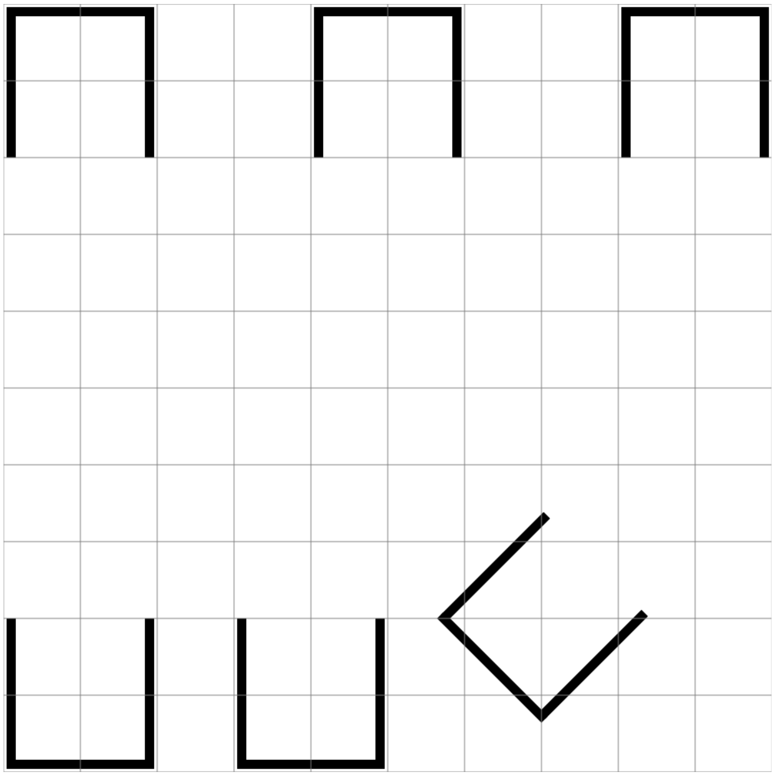
Make the robot follow the path shown. Write down your code below. Try it out with the NONI Robot.



Activity 40

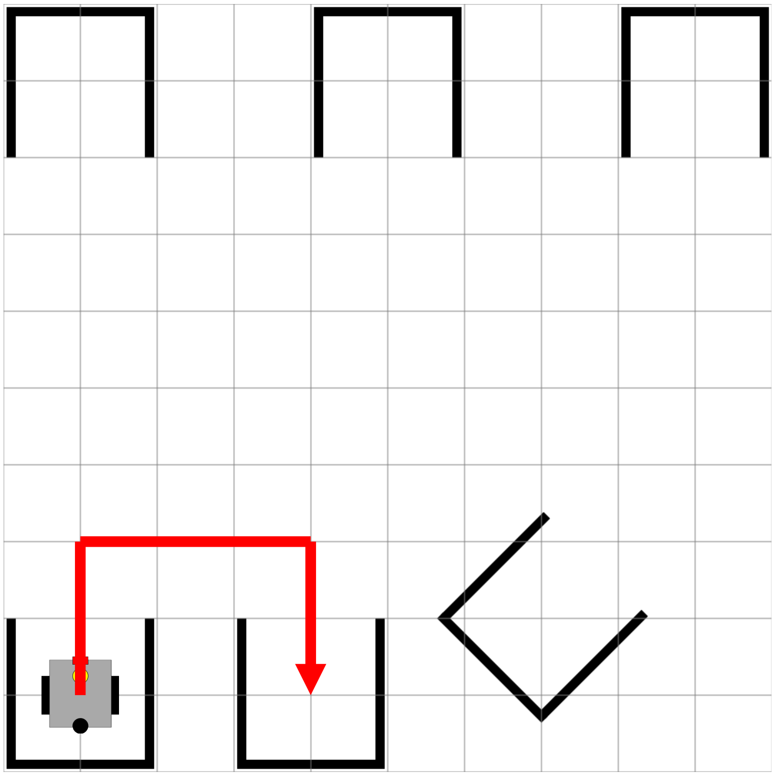
Given the code below, what is the path of the robot? Draw it on the map shown below.

```
selectMap("map2");
robotStartPosition(500, 900, 180);
robotConnect();

forward();
forward();
forward();
left();
forward();
forward();
forward();

robotDisconnect();
```



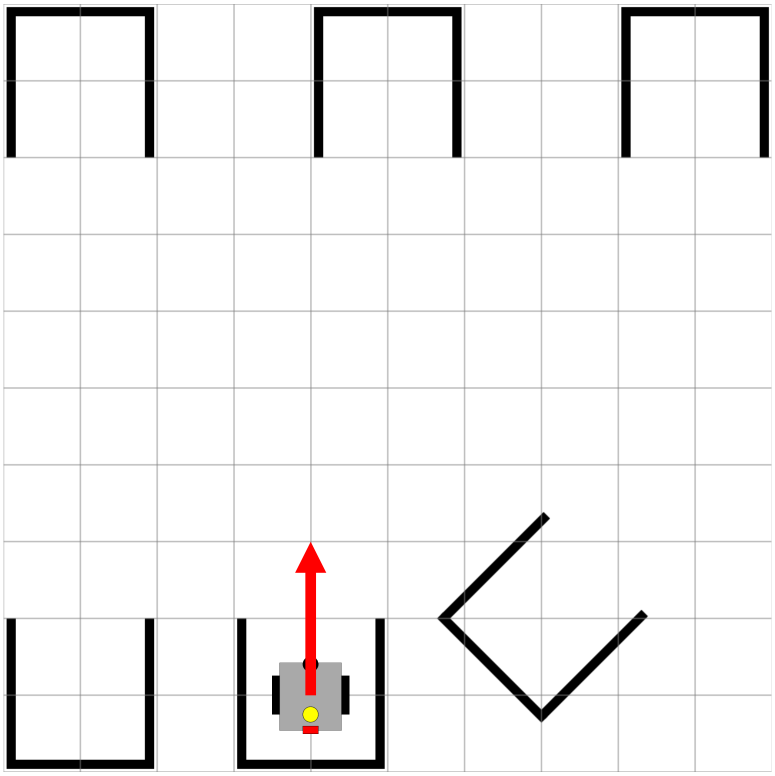
Activity 41

Make the robot follow the path shown. Write down your code below. Try it out with the NONI Robot.



Activity 42

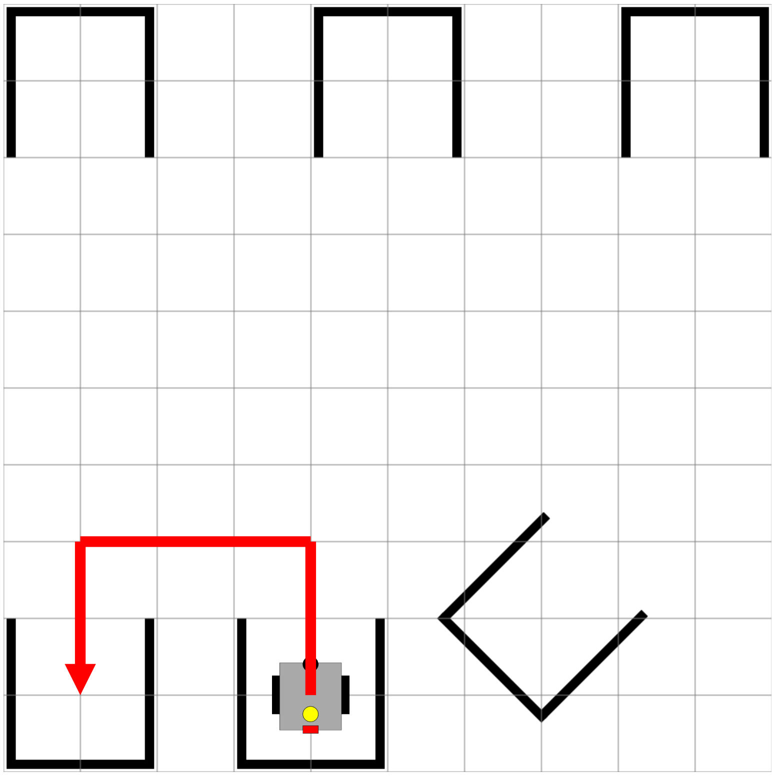
Here is an example for driving in reverse. Look carefully at the path on the map below. It points to the rear of the robot. This requires the robot to drive using the “backward” action command. Try out the code with the NONI Robot.



```
selectMap("map2");
robotStartPosition(400, 100, 180);
robotConnect();

backward();
backward();

robotDisconnect();
```

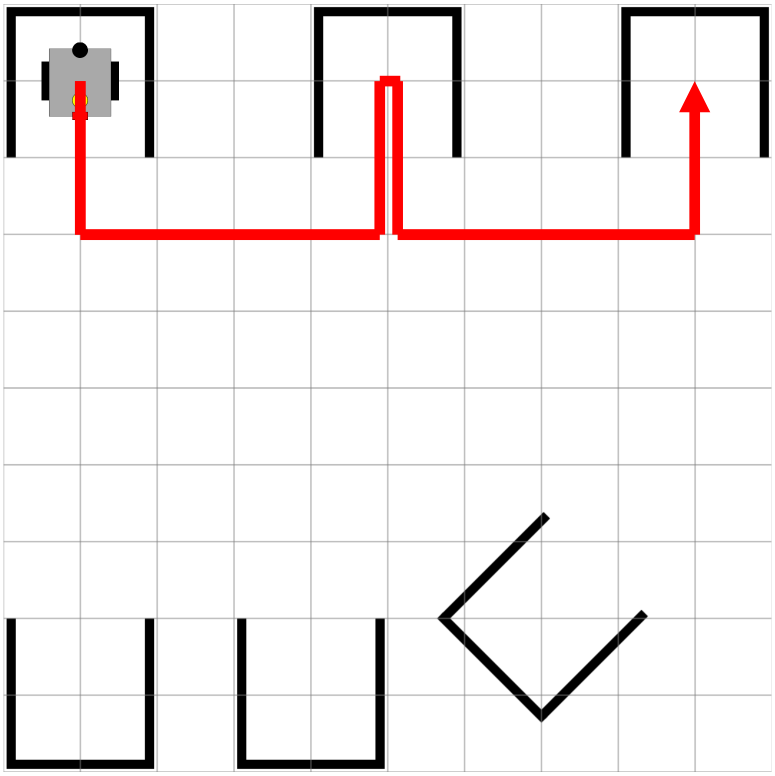
Activity 43

Make the robot follow the path shown. Note that the path requires the robot to drive in the backward direction. Write down your code below. Try it out with the NONI Robot.



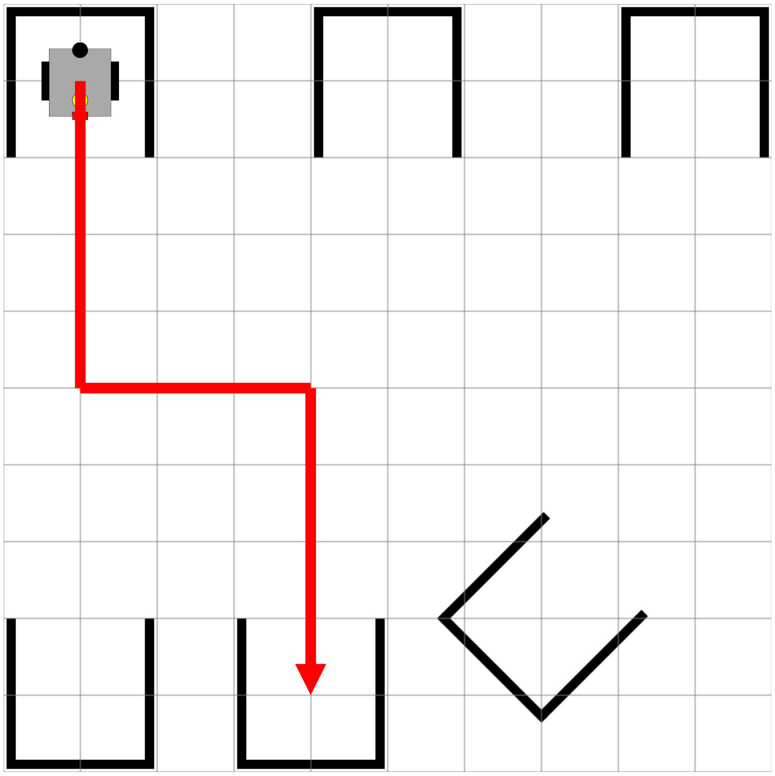
Activity 44

Now let’s make the robot visit two boxes in a single trip. Make the robot follow the path shown. Write down your code below. Try it out with the NONI Robot.



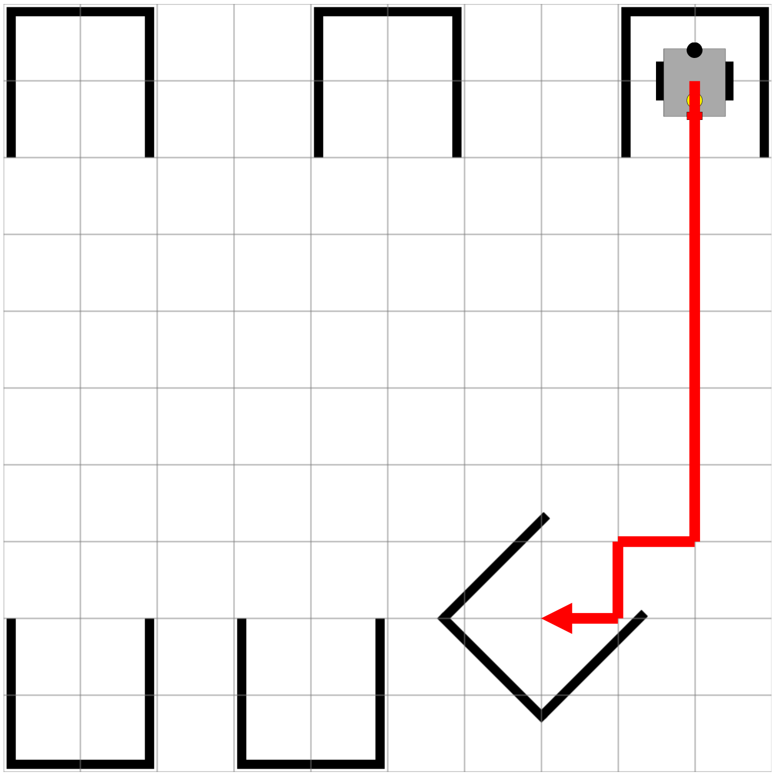
Activity 45

Make the robot follow the path shown. Write down your code below. Try it out with the NONI Robot.



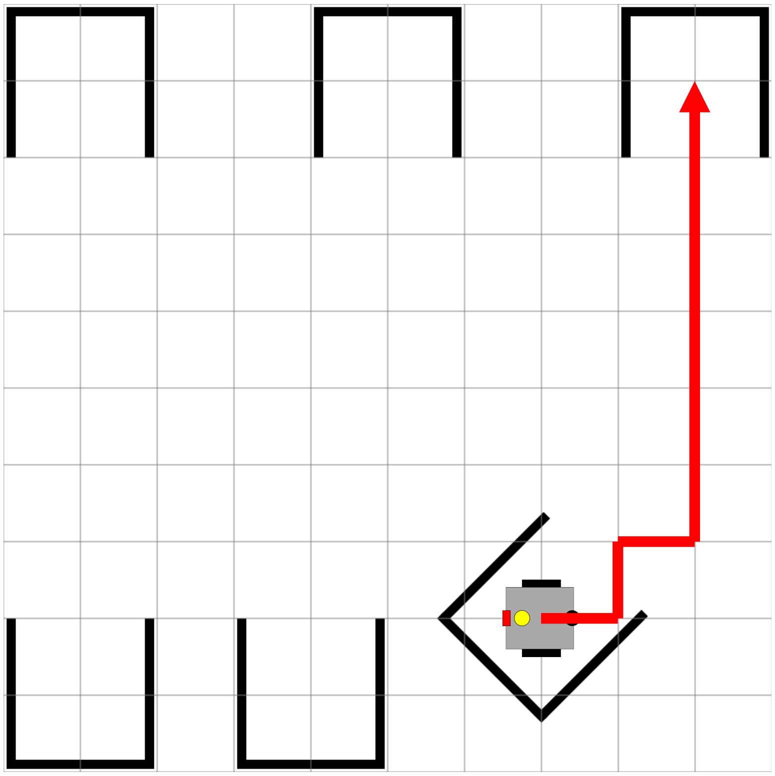
Activity 46

Make the robot follow the path shown. Write down your code below. Try it out with the NONI Robot.



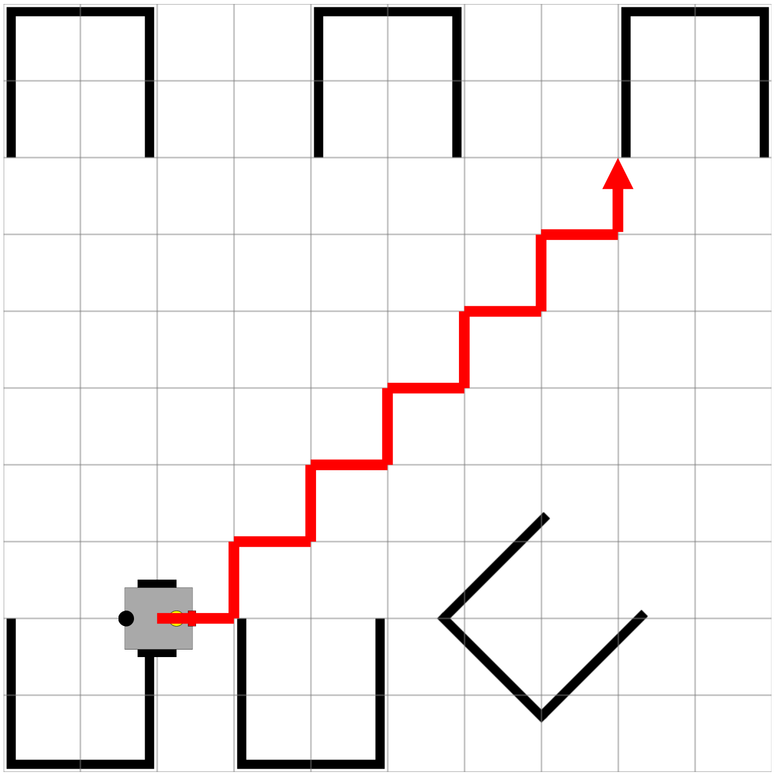
Activity 47

Make the robot follow the path shown. Note that the path requires the robot to drive in the backward direction. Write down your code below. Try it out with the NONI Robot.



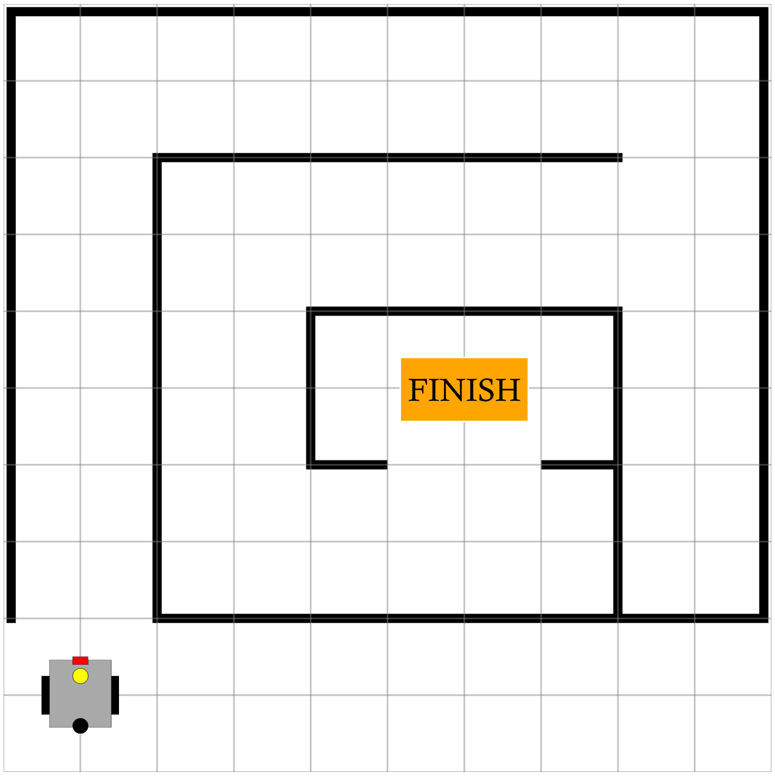
Activity 48

Make the robot follow the path shown. Write down your code below. Try it out with the NONI Robot.



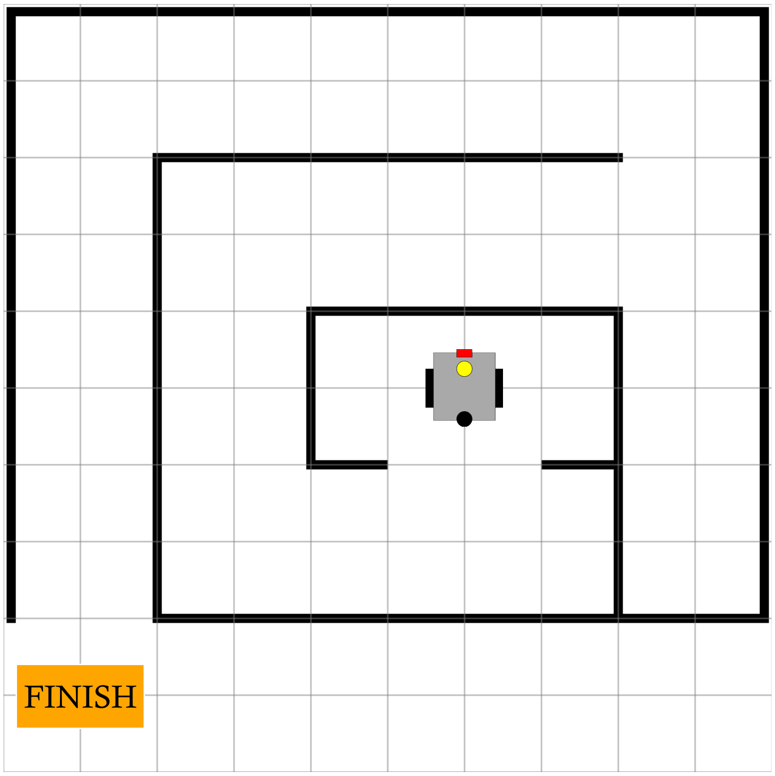
Activity 49

Make the robot go to the “finish” point in the maze as shown. The robot must not cross any of the black lines. Write down your code below. Try it out with the NONI Robot.



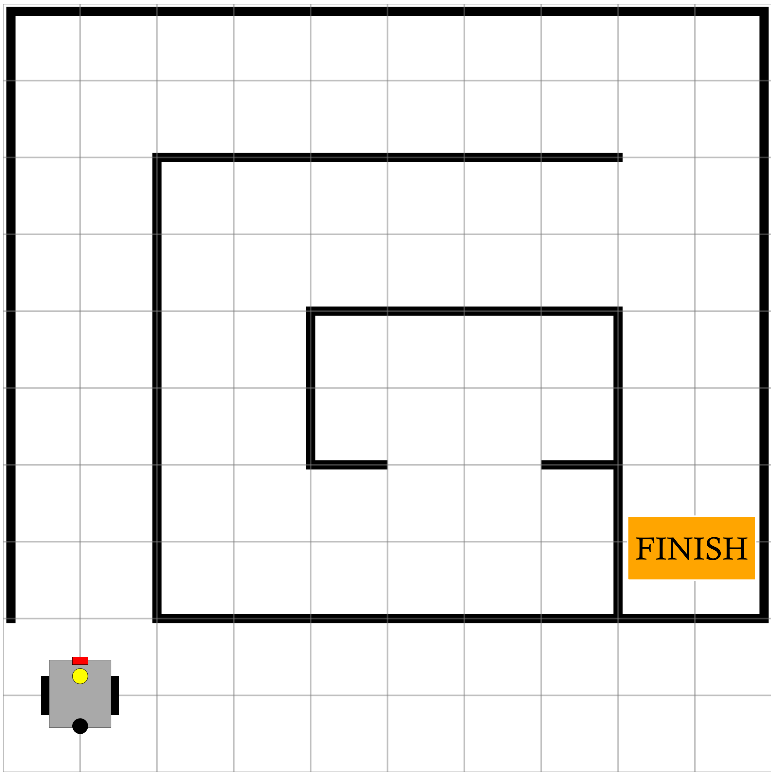
Activity 50

Make the robot go to the “finish” point in the maze as shown. The robot must do this in the backward direction. The robot must not cross any of the black lines. Write down your code below. Try it out with the NONI Robot.



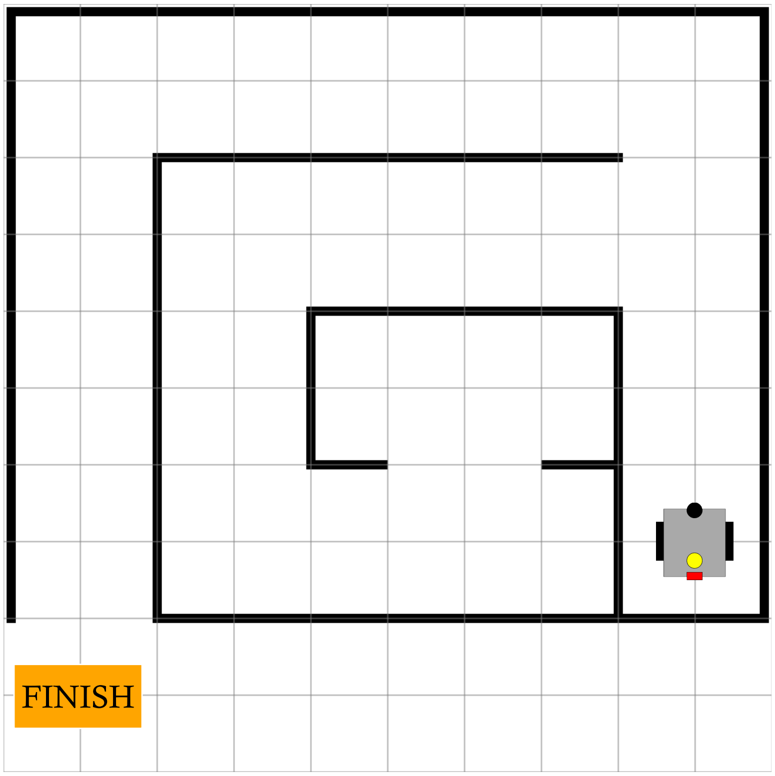
Activity 51

Make the robot go to the “finish” point in the maze as shown. The robot must not cross any of the black lines. Write down your code below. Try it out with the NONI Robot.



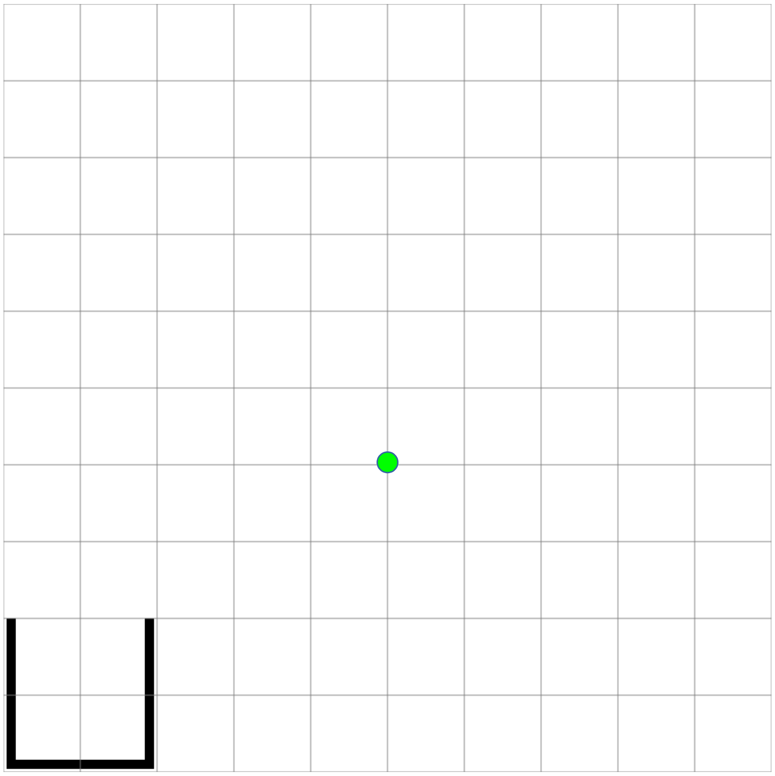
Activity 52

Make the robot go to the “finish” point in the maze as shown. The robot must do this in the backward direction. The robot must not cross any of the black lines. Write down your code below. Try it out with the NONI Robot.



Activity 53

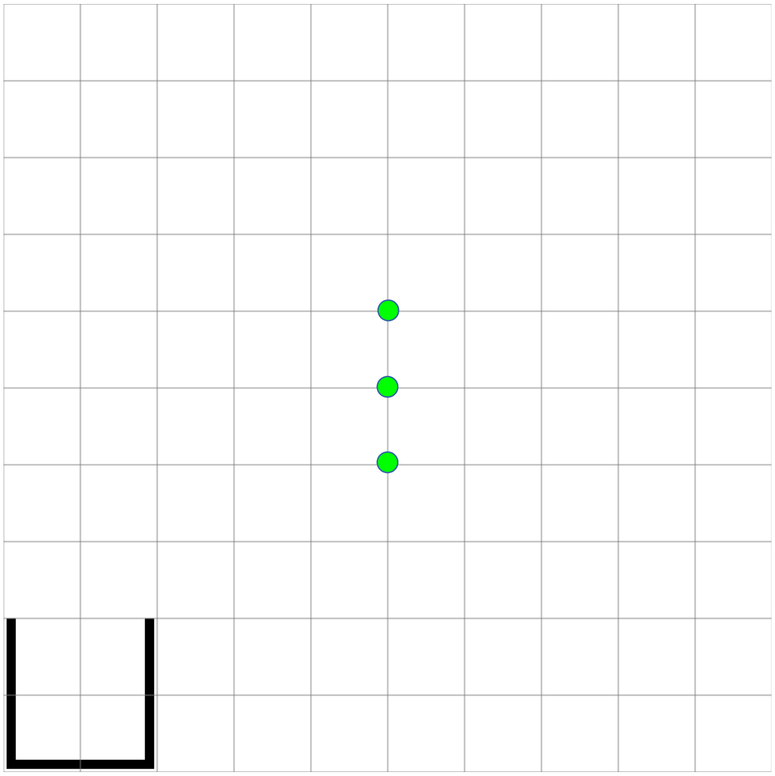
Now let's do some art. Here is an example showing how to draw a paint dot. Try it out with the NONI Robot.



```
selectMap("map1");
robotStartPosition(500, 300, 0);
robotConnect();

forward();
paint();
forward();

robotDisconnect();
```

Activity 54

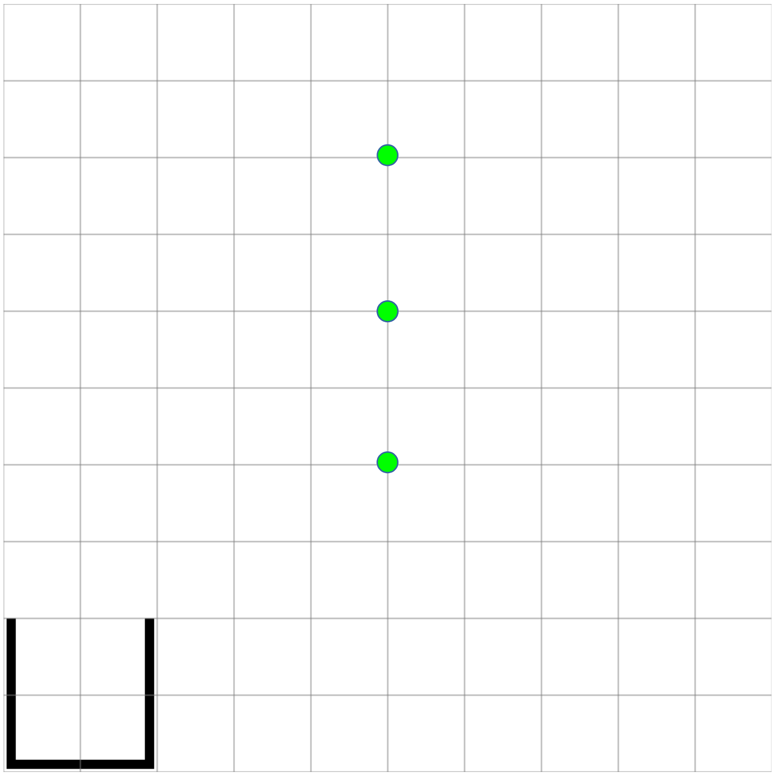
Here is an example showing how to draw three paint dots in a row Try it out with the NONI Robot.



```
selectMap("map1");
robotStartPosition(500, 300, 0);
robotConnect();

forward();
paint();
forward();
paint();
forward();
paint();
forward();

robotDisconnect();
```

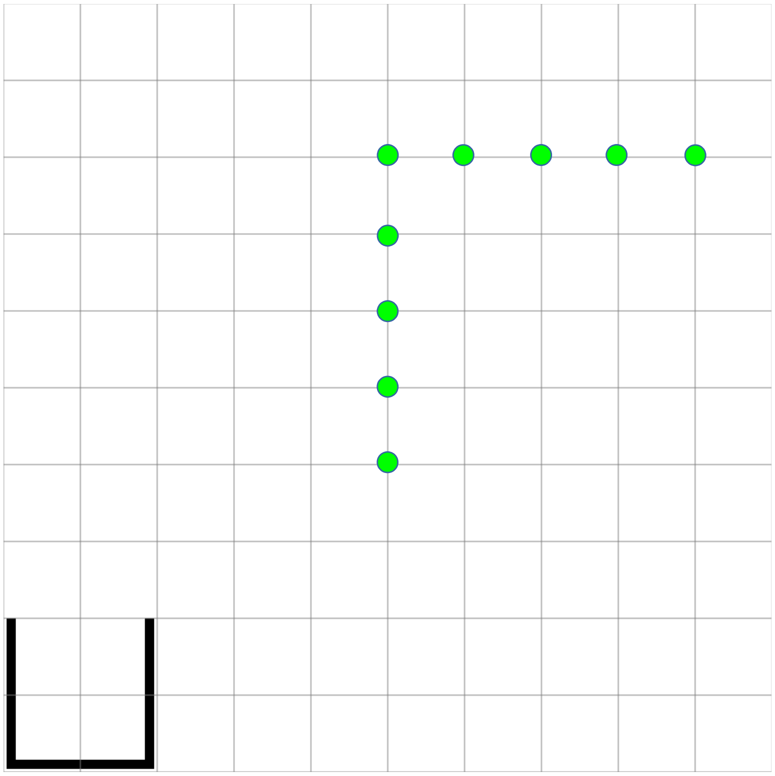
Activity 55

Make the robot draw the paint dot pattern as shown. Write down your code below. Try it out with the NONI Robot.



Activity 56

Here is an example showing how to draw a right "L" shape. Try it out with the NONI Robot.

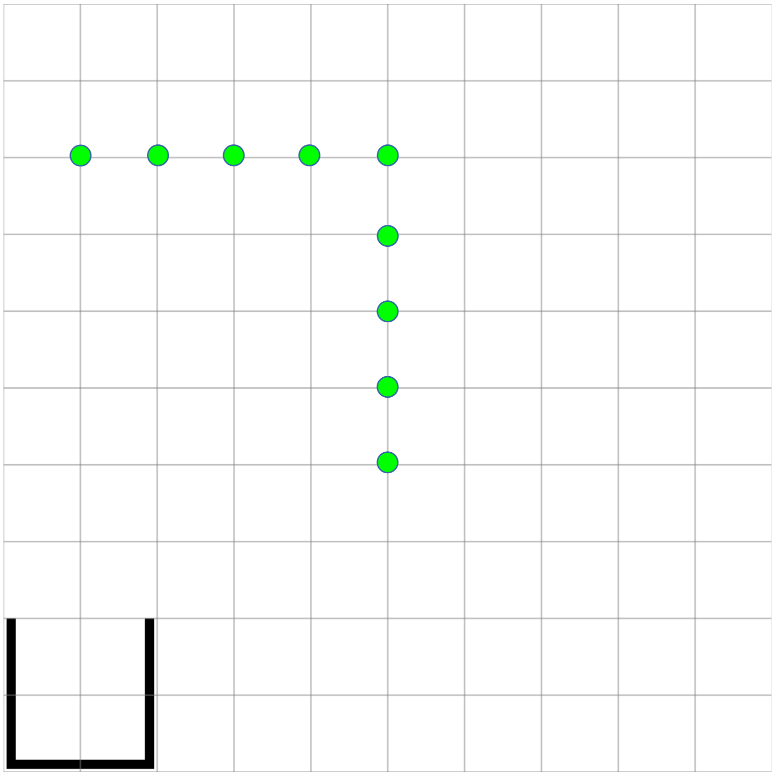


```
selectMap("map1");
robotStartPosition(500, 300, 0);
robotConnect();

forward();
paint();
forward();
paint();
forward();
paint();
forward();
paint();
forward();
paint();
right();

forward();
paint();
forward();
paint();
forward();
paint();
```

```
forward();
paint();
forward();

robotDisconnect();
```

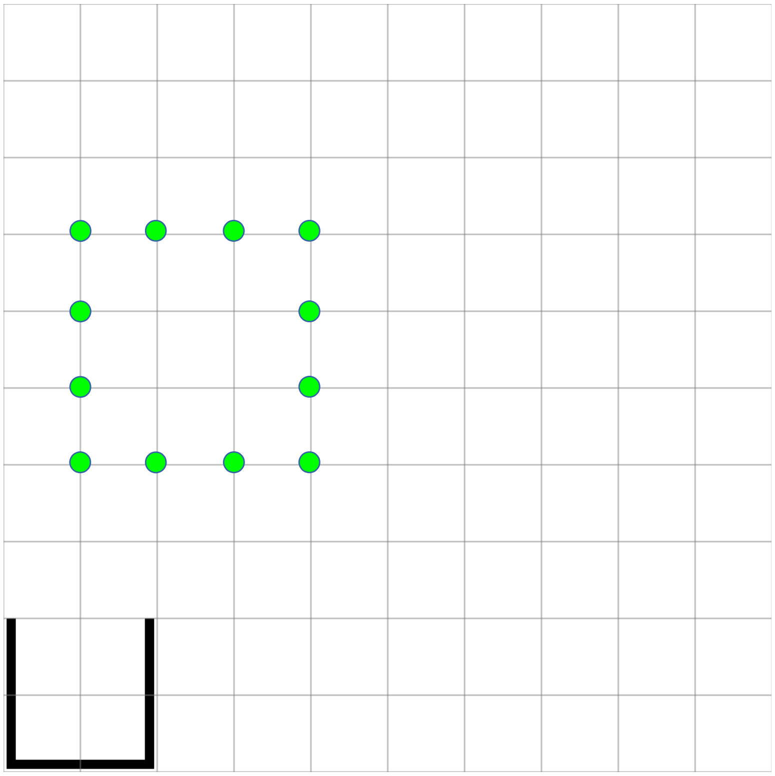
Activity 57

Make the robot draw the paint dot pattern as shown. Write down your code below. Try it out with the NONI Robot.



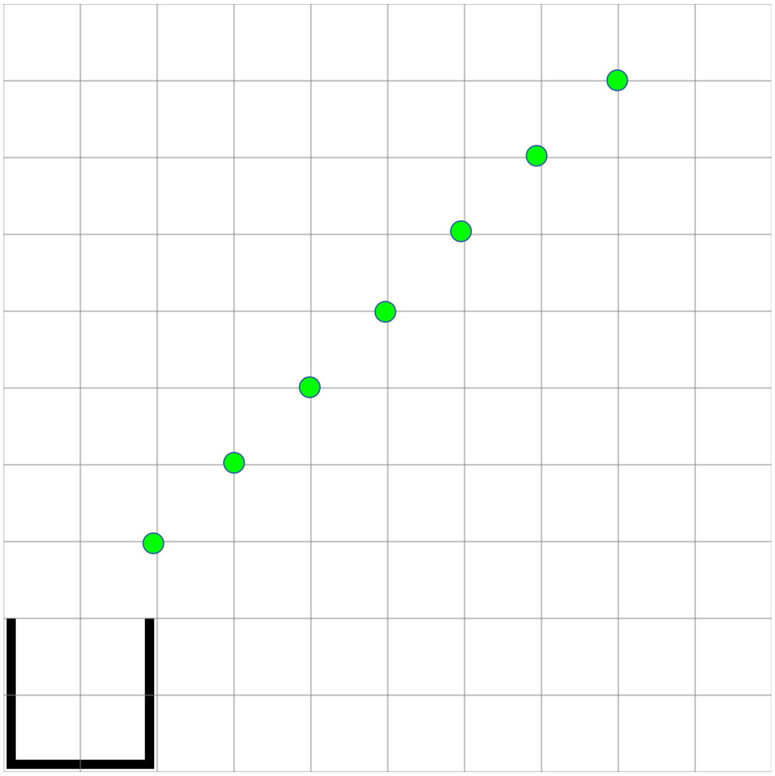
Activity 58

Make the robot draw the paint dot pattern as shown. Write down your code below. Try it out with the NONI Robot.



Activity 59

Now let’s try to draw a diagonal line as shown below. The code instructions are provided below. Try them out with the NONI Robot.

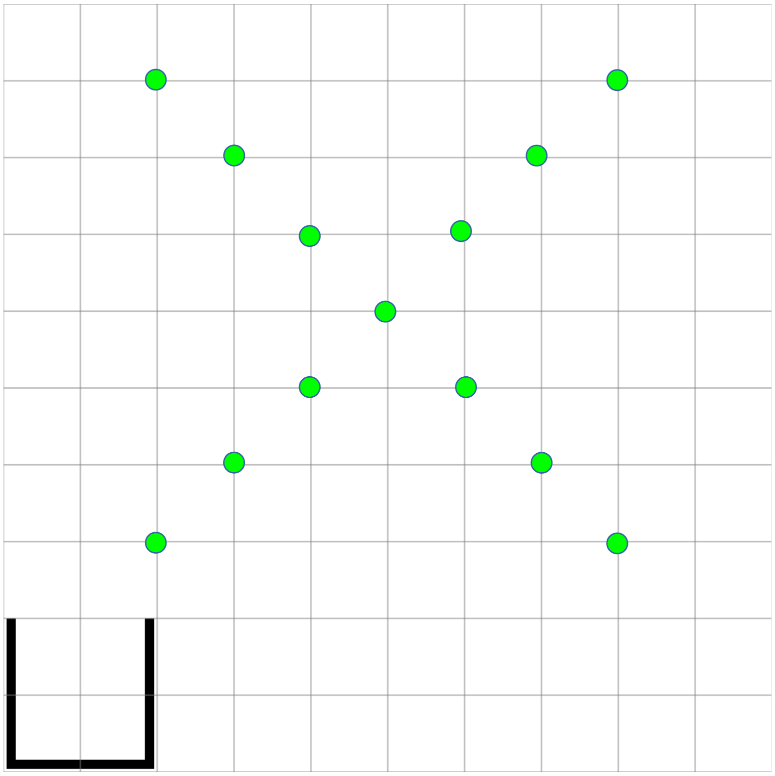


```
selectMap("map1");
robotStartPosition(200, 300, 0);
robotConnect();

paint();
forward();
right();
forward();
left();

paint();
forward();
right();
forward();
left();

paint();
forward();
right();
forward();
left();
```

```
paint();
forward();
right();
forward();
left();

paint();
forward();
right();
forward();
left();

paint();
forward();
right();
forward();
left();

paint();
forward();

robotDisconnect();
```

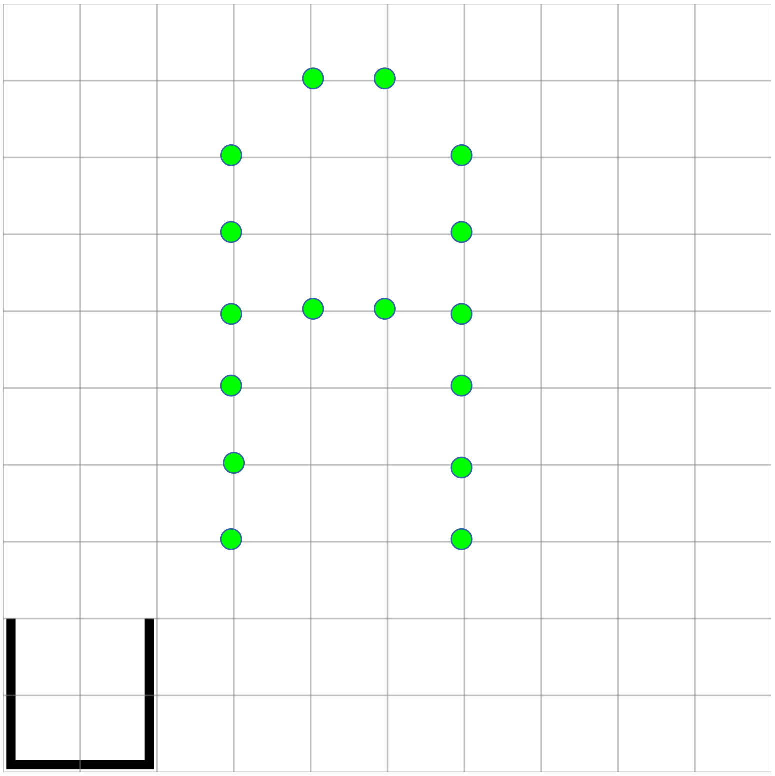
Activity 60

Make the robot draw the letter “X” as shown. Write down your code below. Try it out with the NONI Robot.



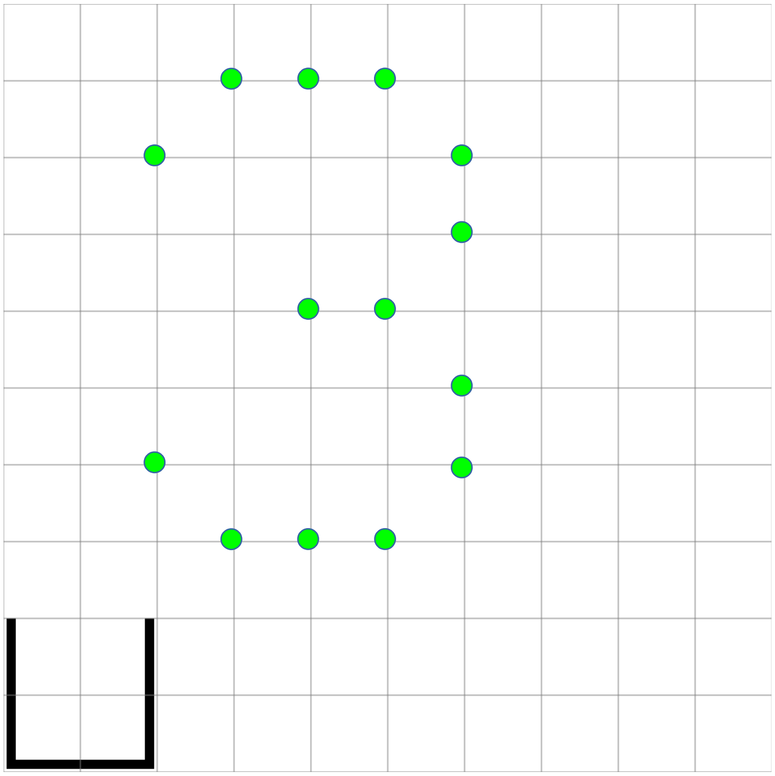
Activity 61

Make the robot draw the letter “A” as shown. Write down your code below. Try it out with the NONI Robot.



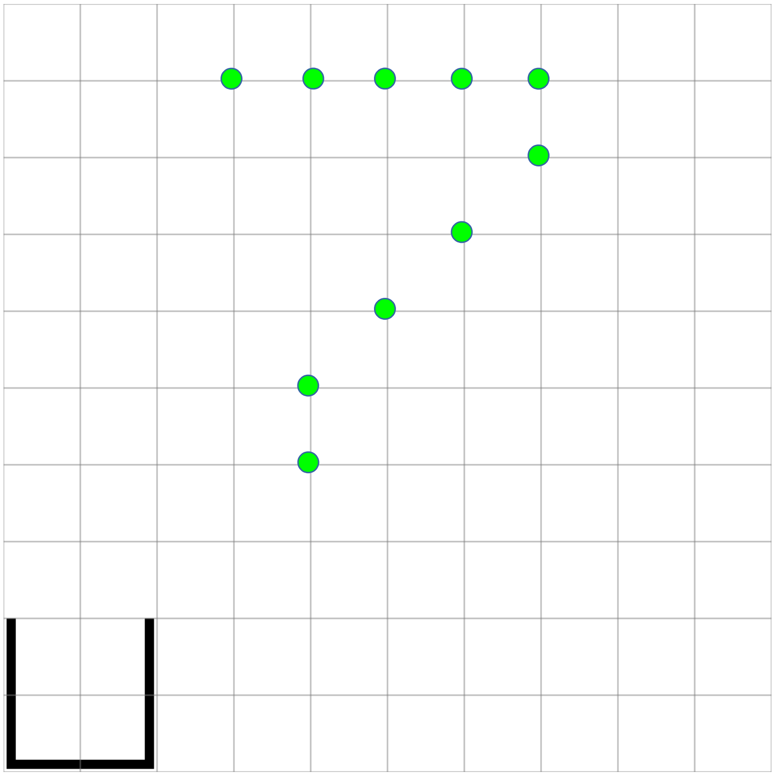
Activity 62

Make the robot draw the digit “3” as shown. Write down your code below. Try it out with the NONI Robot.



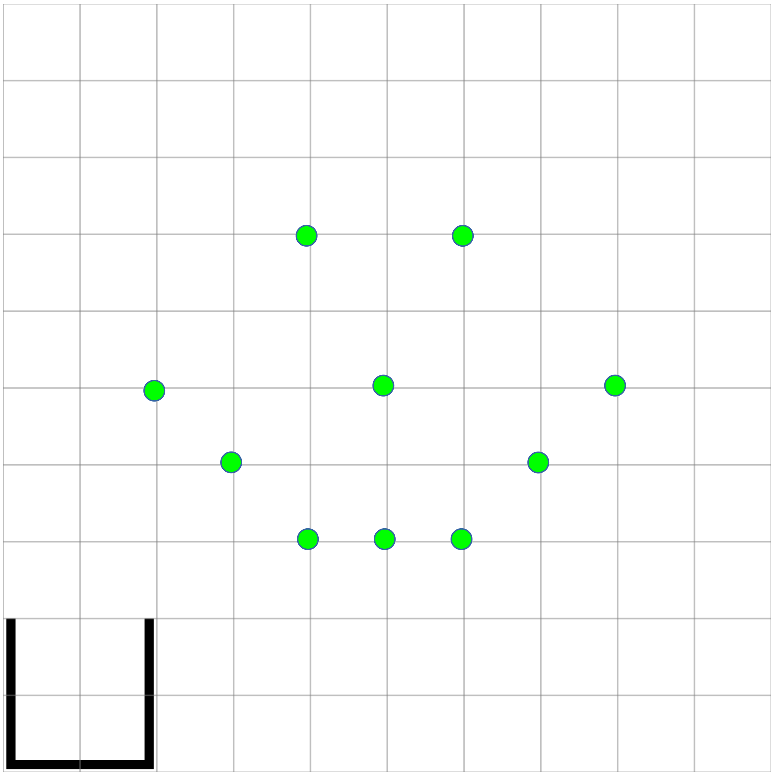
Activtity 63

Make the robot draw the digit “7” as shown. Write down your code below. Try it out with the NONI Robot.



Activity 64

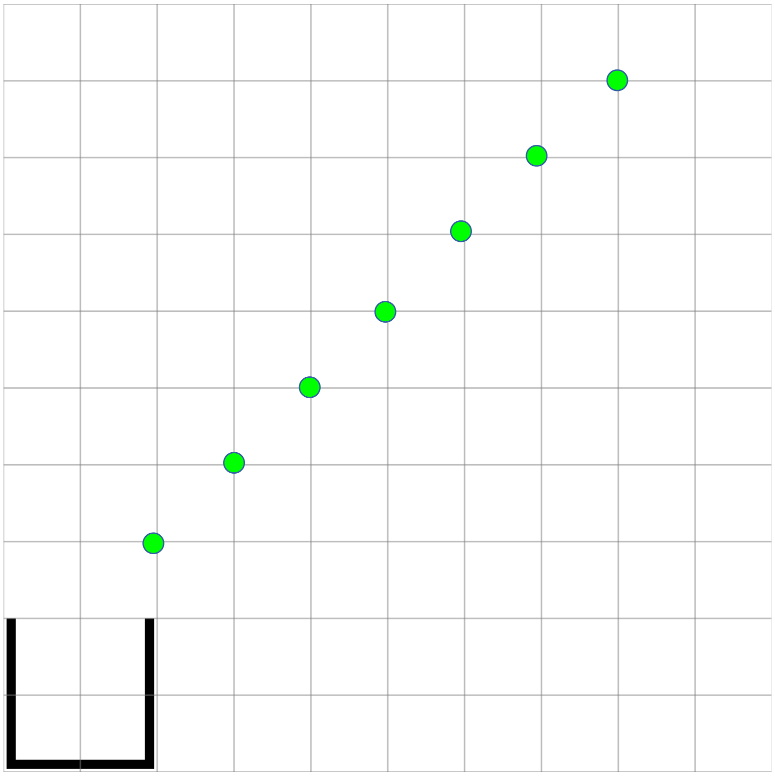
Make the robot draw a smiley face as shown. Write down your code below. Try it out with the NONI Robot.



Activity 65

Now we will look at a way to instruct the robot on repetition. Instead of typing in repeated lines of code instructions, we can just type them once and tell the robot to repeat them in a loop. Go back and review Activity 59 where we drew a diagonal line. Now we will make the robot draw the same line, but with a loop.

The code instructions are provided below. Try them out with the NONI Robot.



```
selectMap("map1");
robotStartPosition(200, 300, 0);
robotConnect();

var i = 1;

while(i < 8) {
  paint();
  forward();
  right();
  forward();
  left();
  i = i + 1;
}

robotDisconnect();
```