



Welcome to Week 2

July 13–19, 2020

Robotics

REMEMBER!!

Submit ALL of this week's challenges (or screen shots of them) to experience@iechamilton.ca by Sunday at noon for your chance to win **1 of 50 \$10 Gift Cards** or the **GRAND PRIZE** of up to \$300 towards an online coding &/or technology related activity, camp, course or subscription (subject to approval).

Have you ever watched automatic machines working and wondered just how they knew what or where to move, or what to pick up? Robotics has to do with the design, construction, operation and application of robots. Basically, creating and building robots and using computer programming to make them do things that humans would otherwise be doing!

Robotics can be found in many career fields such as Advanced Manufacturing, Automotive, Biotechnology, Computer and Mechanical Engineering, and can be found in settings like factories, sports, food processing and healthcare among others.

A career in robotics can have many different job titles; some include Engineer, Technician, Scientist, and Programmer. Jobs are available in both the public and private sectors, as well as in Research & Development and include an ever-growing number of positions at up-and-coming, forward-thinking companies and organizations. Salaries for this field can vary depending on where you choose to work, but you can expect to enter the occupation with a yearly income of \$40,000+.

There are a few courses and programs at Mohawk College that can help lead you to a career in Robotics. Take a look at some of their offerings (they'll let you know which courses you should be looking for in high school too!):

[Mechanical Engineering Technology - 529](#) - 3 Year Advanced Diploma Program

[Electrical Engineering Technology - 582](#) - 3 Year Advanced Diploma Program

[Computer Engineering Technology - Mechatronic Systems - 562](#) - 3 Year Advanced Diploma Program

[Bachelor of Technology - Automotive and Vehicle Engineering Technology](#) - 4.5 year Combined Certificate, Diploma & Degree Program

[Bachelor of Technology - Automation Engineering Technology](#)—4.5 year Combined Certificate, Diploma & Degree Program

Mohawk is also home to the \$3 million [FANUC Robotics Training Laboratory](#), which introduces students to award-winning ROBOGUIDE simulation software from an international industry leader in robotics.



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Challenge!

This week, we are taking you to Hour of Code's "[Build Your Robot World in Java](#)".

You will find a video to watch and a series of instructions to read, follow and practice. To be entered to win one of the prizes this week, you will need to complete (and send in screenshots for) the following practices/exercises:

1. Square Dance
2. Create Walls
3. Add Creatures
4. Moving in a Random Direction
5. Loopy Wanderer
6. Robot Ecosystem

Tips:

- This week you can create a login (with parent permission), in order to save your work as you go.
- Read the whole article (and then re-read it) for help finding how to complete each task.
- These practices can be tricky! Don't give up! Look at Robot Robbie's examples for help.
- If you are struggling, Hamilton Code Clubs Camp can help! [Register](#)
- When taking screenshots, try to show as much of your coding detail as possible.
- Feel free to zoom in or send a few pictures to show both your code and the robots.

Send your completed exercises to experience@iechamilton.ca.

Make sure you include your full name!

Prize winners will be contacted next week via information provided at registration.

You can find our finished practices on the next few pages. Be sure to be creative when completing yours!

If you are interested in exploring Robotics further, here is a fun game you can play!
Follow the [Robot Repair](#) link.



When you load Robot Repair, click here for full screen!

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Challenge!

Square Dance

Hour of Code: Build Your Robot World in Java

0% completed

- Robots and code
- Building the labyrinth: variables and objects
- Wanderer: random numbers
- Loopy wanderer: loops

```

13  robbie = new Robot(0.0, 0.0, "red");
14  maze = new Maze(8, 8, 50);
15  maze.add(robbie);
16
17  // set the robot movement direction:
18  // move things in the maze for one turn
19  robbie.setDirection("south");
20  maze.turn();
21  robbie.setDirection("east");
22  maze.turn();
23  robbie.setDirection("north");
24  maze.turn();
25  robbie.setDirection("west");
26  maze.turn();
27
28  }
  
```

RUN

✓ Succeeded

Create Walls

Hour of Code: Build Your Robot World in Java

0% completed

- Robots and code
- Building the labyrinth: variables and objects
- Wanderer: random numbers
- Loopy wanderer: loops
- Bonus challenge: robot ecosystem

```

16  maze.add(new Wall(2.0, 3.0));
17  maze.add(new Wall(3.0, 3.0));
18  maze.add(new Wall(4.0, 3.0));
19  maze.add(new Wall(2.0, 1.0));
20  maze.add(new Wall(2.0, 2.0));
21  maze.add(new Wall(2.0, 4.0));
22  maze.add(new Wall(1.0, 4.0));
23  maze.add(new Wall(0.0, 6.0));
24  maze.add(new Wall(1.0, 6.0));
25  maze.add(new Wall(2.0, 6.0));
26  maze.add(new Wall(3.0, 6.0));
27  maze.add(new Wall(4.0, 5.0));
28  maze.add(new Wall(5.0, 5.0));
29  maze.add(new Wall(4.0, 0.0));
30  maze.add(new Wall(4.0, 1.0));
31  maze.add(new Wall(0.0, 1.0));
32  maze.add(new Wall(0.0, 2.0));
33
  
```

RUN

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Challenge!

Add Creatures

Hour of Code: Build Your Robot World in Java

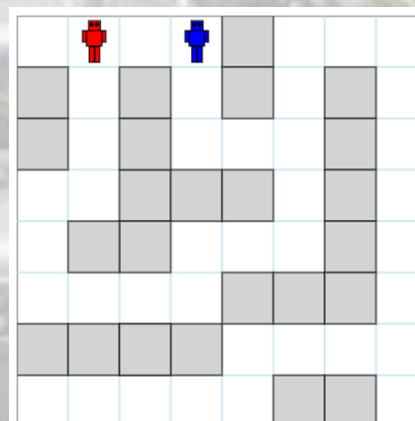
0% completed

- Robots and code
- Building the labyrinth: variables and objects
- Wanderer: random numbers
- Loopy wanderer: loops
- Bonus challenge: robot ecosystem

```

1  import com.educative.robot.*;
2
3  // A program that creates a robot in a maze
4  class RobotDemo {
5
6      public static void main(String[] args) {
7          // set up variables to store the robot and the maze
8          Robot robbie;
9          Robot lola;
10         Maze maze;
11
12         // create the robot and maze, and add
13         // the robot to the maze
14         robbie = new Robot(0.0, 0.0, "red");
15         lola = new Robot(2.0, 0.0, "blue");
16         maze = new Maze(8, 50);
17         maze.add(robbie);
18         maze.add(lola);
19
20         maze.add(new Wall(2.0, 3.0));
21         maze.add(new Wall(3.0, 3.0));
22         maze.add(new Wall(4.0, 3.0));
23         maze.add(new Wall(2.0, 1.0));
24         maze.add(new Wall(2.0, 2.0));
25         maze.add(new Wall(2.0, 4.0));

```



✓ Succeeded

Moving in a Random Direction

Hour of Code: Build Your Robot World in Java

0% completed

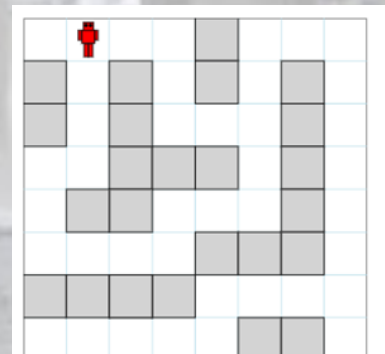
- Robots and code
- Building the labyrinth: variables and objects
- Wanderer: random numbers
- Loopy wanderer: loops
- Bonus challenge: robot ecosystem

```

16         maze.add(new Wall(2.0, 3.0));
17         maze.add(new Wall(3.0, 3.0));
18         maze.add(new Wall(4.0, 3.0));
19         maze.add(new Wall(2.0, 1.0));
20         maze.add(new Wall(2.0, 2.0));
21         maze.add(new Wall(2.0, 4.0));
22         maze.add(new Wall(1.0, 4.0));
23         maze.add(new Wall(1.0, 6.0));
24         maze.add(new Wall(1.0, 6.0));
25         maze.add(new Wall(1.0, 6.0));
26         maze.add(new Wall(2.0, 6.0));
27         maze.add(new Wall(3.0, 6.0));
28         maze.add(new Wall(4.0, 5.0));
29         maze.add(new Wall(5.0, 5.0));
30         maze.add(new Wall(4.0, 6.0));
31         maze.add(new Wall(6.0, 1.0));
32         maze.add(new Wall(6.0, 1.0));
33         maze.add(new Wall(6.0, 2.0));

```

RUN



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Challenge!

Loopy Wanderer

Hour of Code: Build Your Robot World in Java

0% completed

Search Course

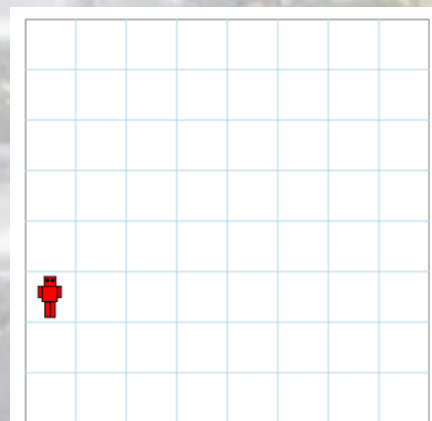
- ☐ Robots and code
- ☐ Building the labyrinth: variables and objects
- ☐ Wanderer: random numbers
- ☒ Loopy wanderer: loops
- ☐ Bonus challenge: robot ecosystem

```

7 // set up variables to store the robot and the maze
8 Robot robbie;
9 Maze maze;
10
11 Random randomGenerator = new Random();
12 int dir;
13
14 // create the robot and maze, and add
15 // the robot to the maze
16 robbie = new Robot(3.0, 3.0, "red");
17 maze = new Maze(8, 8, 50);
18 maze.add(robbie);
19
20 // your code here:
21 for(int i = 0; i < 20; i++){
22     dir = randomGenerator.nextInt(4);
23     robbie.setDirection(dir);
24     maze.turn();
25 }
26
27 }
28

```

RUN



Robot Ecosystem

```

19 class Ecosystem {
20
21     public static void main(String[] args) {
22         // set up variables to store the robot and the maze
23         Wanderer robbie;
24         Wanderer lola;
25         Wanderer gretchen;
26         Wanderer tommy;
27         Wanderer ariel;
28         Wanderer archie;
29         Maze maze;
30         Thing gold;
31
32         // create the robot and maze, and add
33         // the robot to the maze
34         robbie = new Wanderer(0.0, 1.0, "red");
35         lola = new Wanderer (1.0, 2.0, "blue");
36         gretchen = new Wanderer (2.0, 3.0, "blue");
37         tommy = new Wanderer (3.0, 4.0, "red");
38         ariel = new Wanderer (4.0, 5.0, "blue");
39         archie = new Wanderer (5.0, 6.0, "red");
40         gold = new Thing(7.0, 7.0);
41
42         // add the robot and the gold, and some other robots
43         maze = new Maze(8, 8, 50);
44
45         // add the robot and the gold,
46         // the maze, by calling the w
47         // other method you devise.
48         maze.add(robbie);
49         maze.add(lola);
50         maze.add(gretchen);
51         maze.add(ariel);
52         maze.add(tommy);
53         maze.add(archie);
54         maze.add(gold);
55
56         // add some walls here:
57         maze.add(new Wall(1, 5));
58         maze.add(new Wall(1, 8));
59         maze.add(new Wall(2, 0));
60         maze.add(new Wall(2, 2));
61         maze.add(new Wall(4, 6));
62         maze.add(new Wall(5, 1));
63         maze.add(new Wall(5, 3));
64         maze.add(new Wall(7, 1));
65         maze.add(new Wall(8, 7));
66
67         // For ten turns, have the robot
68         // the maze, by calling the w
69         // other method you devise.
70         for(int i = 0; i < 10; i++){
71             robbie.wander();
72             lola.wander();
73             gretchen.wander();
74             tommy.wander();
75             ariel.wander();
76             archie.wander();
77             maze.turn();
78         }
79     }
80 }

```



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