

Karel Can't Turn Right!

Corresponding Material

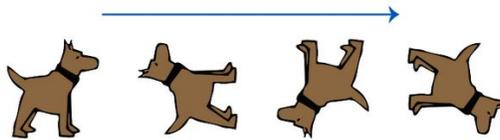
Introduction to Programming, Lesson 3: Karel Can't Turn Right

Discussion

You may have noticed that Karel does not know how to turn right! That is a problem... how will Karel travel around the world only by moving and turning left?

The Anatomy of a Right Turn

As it turns out, there is a way for Karel to make right turns. Karel can "turn right" by turning left three times. Three lefts make a right!



We can teach Karel what it means to turn right by creating a **function**.

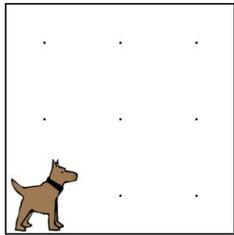
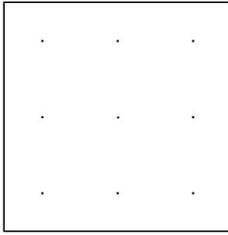
Exercise

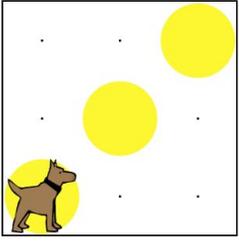
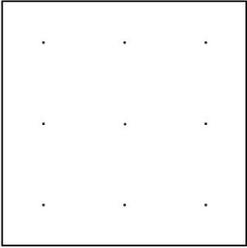
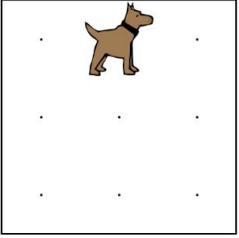
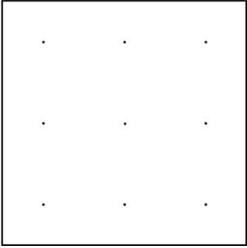
- Fill in the commands that Karel needs to do whenever the `turnRight()` function is called:

```
function turnRight() {
```

```
}
```

- For each initial program written below, draw in the result world. Then alter the program to use the `turnRight()` function where applicable to complete the same task. You can assume that the `turnRight()` function was previously defined.

| Starting World | Initial Program | Result World | Program Using <code>turnRight()</code> |
|---|---|---|--|
|  | <pre>turnLeft(); move(); turnLeft(); turnLeft(); turnLeft(); putBall(); move();</pre> |  | |

| | | | |
|---|--|---|--|
|  | <pre>takeBall(); move(); turnLeft(); move(); takeBall(); move(); turnLeft(); turnLeft(); turnLeft(); move(); takeBall();</pre> |  | |
|  | <pre>move(); putBall(); turnLeft(); turnLeft(); turnLeft(); move(); putBall(); move(); putBall(); turnLeft(); turnLeft(); turnLeft(); move(); move(); putBall(); turnLeft(); turnLeft(); turnLeft(); move(); putBall(); move(); putBall(); turnLeft(); turnLeft(); turnLeft(); move();</pre> |  | |

Conclusion Questions

1. What do you notice about each program that used the `turnRight()` function in terms of length?
2. Name two reasons functions are useful in code.