

```

17 36 public Direction turnLeft() {
18 - switch (this) {
19 - case NORTH:
20 -     return WEST;
21 - case EAST:
22 -     return NORTH;
23 - case SOUTH:
24 -     return EAST;
25 - default:
26 - case WEST:
27 -     return SOUTH;
28 - }
29 37 + return leftMap.get(this);
30 38 }
31 39
32 40 public Direction turnRight() {
33 - switch (this) {
34 - case NORTH:
35 -     return EAST;
36 - case EAST:
37 -     return SOUTH;
38 - case SOUTH:
39 -     return WEST;
40 - default:
41 - case WEST:
42 -     return NORTH;
43 - }
44 41 + return rightMap.get(this);
45 42 }
46 43
47 44 public int getDeltaX() {

```

We were using a switch statement to turn the direction of the current direction either left or right. This code smell exists, because we thought it was easier to implement using switch statements since there are only four cases of direction.

```

... 43 src/main/java/edu/gatech/cs2340/td/Direction.java
... @@ -1,5 +1,8 @@
1 1 package edu.gatech.cs2340.td;
2 2
3 3 + import java.util.HashMap;
4 4 + import java.util.Map;
5 5 + import java.util.*;
6 6
7 7 public enum Direction {
8 8     NORTH(0, -1),
9 9     EAST(1, 0),
10 10
11 11 @@ -8,38 +11,34 @@ public enum Direction {
12 12
13 13 private final int deltaX;
14 14 private final int deltaY;
15 15
16 16 // left
17 17 // right
18 18
19 19 Direction(int deltaX, int deltaY) {
20 20     this.deltaX = deltaX;
21 21     this.deltaY = deltaY;
22 22 }
23 23
24 24 + public static final Map<Direction, Direction> leftMap = Map.of(
25 25     NORTH, WEST,
26 26     EAST, NORTH,
27 27     SOUTH, EAST,
28 28     WEST, SOUTH
29 29 );
30 30 + public static final Map<Direction, Direction> rightMap = Map.of(
31 31     NORTH, EAST,
32 32     EAST, SOUTH,
33 33     SOUTH, WEST,
34 34     WEST, NORTH
35 35 );
36 36
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```

In order to fix the code smell, I decided to utilize the HashMap data structure which returns the value associated with the key. I initialized a hashmap called leftmap which maps the left direction of each direction. I also initialized a hashmap called rightmap which maps the right direction of each direction.