BIS 420 PROGRAMMING FOR DATA SCIENCE
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CHAPTER 18 EXERCISE 18.7
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This exercise uses TurtleWorld from Chapter 4. You will write code that makes

Turtles play tag. If you are not familiar with the rules of tag, see http: // en. wikipedia. org/

wiki/ Tag_ (game) .

1. Download http: // thinkpython. com/ code/ Wobbler. py and run it. You should see a

TurtleWorld with three Turtles. If you press the Run button, the Turtles wander at random.

2. Read the code and make sure you understand how it works. The Wobbler class inherits from

Turtle, which means that the Turtle methods lt, rt, fd and bk work on Wobblers.

The step method gets invoked by TurtleWorld. It invokes steer, which turns the Turtle

in the desired direction, wobble, which makes a random turn in proportion to the Turtle's

clumsiness, and move, which moves forward a few pixels, depending on the Turtle's speed.

3. Create a file named Tagger.py. Import everything from Wobbler, then define a class named

Tagger that inherits from Wobbler. Call make_world passing the Tagger class object as an

argument.

4. Add a steer method to Tagger to override the one in Wobbler. As a starting place, write a

version that always points the Turtle toward the origin. Hint: use the math function atan2

and the Turtle attributes x, y and heading.

5. Modify steer so that the Turtles stay in bounds. For debugging, you might want to use the

Step button, which invokes step once on each Turtle.

6. Modify steer so that each Turtle points toward its nearest neighbor. Hint: Turtles have an

attribute, world, that is a reference to the TurtleWorld they live in, and the TurtleWorld has

an attribute, animals, that is a list of all Turtles in the world.

7. Modify steer so the Turtles play tag. You can add methods to Tagger and you can override

steer and __init__, but you may not modify or override step, wobble or move. Also, steer is allowed to change the heading of the Turtle but not the position.

Adjust the rules and your steer method for good quality play; for example, it should be possible for the slow Turtle to tag the faster Turtles eventually.