Homework 6

Software Design **Allen B. Downey**
Fall 2004

Due: Thursday 14 October.
The reading for this assignment is Chapters 13–14 of *How to think...*.

6.1 Turtle Tag

1. Download `Tagger.py` from the class web page:

   ```
   wget http://wb/sd/code/Tagger.py
   ```

   It contains code very similar to `Wanderer.py` from Homework 2. You might find that it makes more sense now :)

   The object of this homework is to make the turtles play tag. When the program starts, it will choose one of the turtles to be "it". This turtle will chase the others, and when it catches one, it tags the other turtle. The other turtle becomes "it," and the game proceeds.

   Some additional rules are:

   (a) Turtles have to stay in bounds. You can use an algorithm like what you used on Homework 2.

   (b) After a turtle is tagged, it has to sulk for a while before it can start chasing the other turtles.

   (c) It should be possible, eventually, for the slow turtle to tag the faster turtles.

   Here are some suggestions for methods you might want to have in the Tagger class:

   - Compute the distance to another turtle.
   - Turn toward another turtle. HINT: see the documentation of `math.atan2`.
   - Find the closest other turtle. Note: the `World` object has an attribute named `animals` that is a list of all the Turtles currently in the world.
   - Tag another turtle.

   WARNING: Turtles already have an attribute named `tag`, so you should not create a method named `tag`.