

CSCI 190: HW3

Due on **Wednesday, March 2 at 8:00am** (before the start of class.)

Your solution should be submitted to the CSCI 190 drop box on middfiles. Your program MUST be named as follows: **YourName-HW3.nlogo**

Programs will be graded on correctness as well as on good structure and commenting. Specify which option below you are attempting, and whether you are attempting the extra credit.

Option I. (Up to 90pts) Begin with the **Islands-In-The-Sea** model to HW2. You will add 20 turtles to move around this world.

1. Each turtle should have a **random size between 1.0 and 2.0**. *Approximately* half of the turtles should have a size less than 1.5, and will be referred to as “small turtles”. Turtles of size 1.5 or greater will be known as “large turtles”.
2. All turtles should have the “**turtle**” shape.
3. Small turtles should be **yellow**. Large turtles should be **red**.
4. Turtles should move from **0.05 to .1 unit per tick**. They can turn up to **10 degrees left or right**.
5. There are **two seasons**: winter and summer. Initially, it is winter. Every 1000 ticks, the season changes from winter to summer or vice versa.
6. **During the summer**, all the turtles wander around the water with no preference for deep or shallow.
7. **During the winter**, *small turtles tend to move toward the highest land*, while *large turtles tend to move toward the deepest water*. (Note that they should not simply find the highest land or deepest water and just stay there. There should be a probabilistic element to the behavior.)
8. **You should have a **setup** button, and a **move** button. The **move** button should continuously move the turtles as described above, with the season changing as specified.**

Option II. (Up to 100pts): Write the model described above, but modify the winter behavior of small turtles so that they stay around the “beach”. We will define the **beach** as a patch of land within two patches of the water. In other words, during winter small turtles should leave the water and go to the land and wander around, but should not go too far from the water.

Extra Credit (up to 5pts): Create a spring and fall season as well. Each season is 1000 ticks. Seasons progress from winter to spring to summer to fall. During summer and winter, behavior is as described above. During spring and fall, all of the turtles (regardless of size) wander around in shallow water. (You may interpret “shallow” in any way that is meaningful, as long as the spring/fall behavior is visibly different from summer. Be sure to comment on your definition of shallow.)

