Lab 4 – Animal kingdom

CS 143

You may work individually or in groups of two

# Instructions:

* You will be writing a set of classes that define the behavior of certain animals that will be implemented in a wildlife simulation program**. (You will not be writing the simulation program.)**
* You should create a Critter super class that your other animals will inherit behavior from. You may choose to have some animals inherit behavior from other animals but remember you should only do this if one animal has an is\_a relationship with the other.
* The will exist in a simulated 2D world with 100x100 possible locations (0 <= x <= 99) and (0<= y <= 99) each animal will keep track of its own location. (A 100x100 grid)
* The Critter Class should have the following attributes and behaviors:
  + Fields
    - int x\_location;
    - int y\_location;
  + Methods:
    - A constructor that takes no parameters that randomly places a new Critter on the grid. public Critter()
    - A constructor that takes two integers and places a new Critter at a specific location. public Critter(int x, int y)
    - A toString() method that returns “?”
    - A getMove() method that does not change the position of the Critter.
* Assume that if an animal moves off the grid, it reappears on the other side.
* You will write the following classes which will extend Critter and override the following methods so that…

|  |  |  |
| --- | --- | --- |
| Class | toString | getMove() |
| Bird | B | Moves randomly 1 step in one of the four directions |
| Frog | F | Moves randomly 3 steps in one of the four directions |
| Mouse | M | Moves west 1 step, north 1 step (zig-zag to the northwest) |
| Rabbit | V | Move north 2 steps, east 2 steps, south 2 steps, (“Hops” to the right) |
| Snake | S | Moves south 1 step, east 1 step, south 1 step, west 2 steps, south 1 step, east 3 steps, south 1 step, west 4 steps,… (slithers left to right in increasing length) |
| Turtle | T | Moves south 5 steps, west 5 steps, north 5 steps, east 5 steps |
| Wolf | W | Has custom behavior you define. |

…

* Again, you are not writing a complete program, only the class definitions. Store each class definition in its own file: Critter.java, Bird.java , etc and submit them to canvas in one zipped. .zip file.

NOTE: This programming project is a scaled down version of the last weekly programming project assigned to CS142 students at the University of Washington. In the more complicated version, the animals also interact with each other by fighting and/or mating with each other if they land on the same spot. The instructors provide the main simulation class and the super Critter class. I am considering giving you this full assignment for Weekly Programming Lab 5. By then we will have covered all the material covered in the UW 142 course. You might want to start thinking about how you would implement the more complex version of this assignment. If you are interested, all of the assignment details can be found here: (Under Homework 8)

https://courses.cs.washington.edu/courses/cse142/16wi/homework.shtml

Remember do not use their Critter class as the Critter class for the more complex version of the project is different than discussed here.