EE422C Project 4 (Critters) README

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GitHub Repository: https://github.com/synacktic/critter

Critter Data Structure

Created a world map to hold the Critters by implementing a 2D grid with each coordinate containing a List of all Critters at that position

Babies & Population List

Used provided ArrayList

New Classes

Sector - Sectors for the critters to live in on the world map

Fields:

- private Critter critter
- private List<Critter> neighbors

Methods:

- private Sector(Critter critter)

Critter1 - custom critter

Fields:

- private static final int GENE_TOTAL: number of genes the critter has
- private int[] genes: array that holds the specific genes for the critter
- private int dir: direction the Critter is facing
- private int longevity: used to count how many timesteps the Critter1 has been alive. Used for deciding to reproduce.

Methods:

- public String toString(): represents the Critter on the world with a 1
- public Boolean fight(String): decide to fight based on the outcome for a randomly generated number from 0-33, less likely to fight another Critter1
- doTimeStep(): decides to run if roll is odd, decide to breed every 5th timestep if it has enough health

Critter2 - custom critter

Fields:

- private static final int GENE_TOTAL: number of genes the critter has
- private int[] genes: array that holds the specific genes for the critter
- private int dir: direction the Critter is facing

Methods:

- public String toString(): represents the Critter on the world with a 2
- public Boolean fight(String): fights every critter except other Critter2s
- doTimeStep(): walks only if it has enough energy to, decide to reproduce only if the randomly generated roll is a multiple of 19

Critter3 - custom critter

Fields:

- private static final int GENE_TOTAL: number of genes the critter has
- private int[] genes: array that holds the specific genes for the critter
- private int dir: direction the Critter is facing

Methods:

- public String toString(): represents the Critter on the world with a 3
- public Boolean fight(String): Only attacks its own kind every other time
- don't run if it already ran this time around
- doTimeStep(): Breeds at a high energy level to make strong children
- simplified genetic code
- only moves if it has to

Critter4 - custom critter

Fields:

- private static final int GENE_TOTAL: number of genes the critter has
- private int[] genes: array that holds the specific genes for the critter
- private int dir: direction the Critter is facing

Methods:

- public String toString(): represents the Critter on the world with a 4
- public Boolean fight(String): Does not fight if it can breed instead
- Always eat the algae
- Don't run if it already moved this time around
- doTimeStep(): Does not move too often, unless it runs from a fight
- Breeds at a lower energy level
- ⅛ chances to mutate its genes twice as fast

Critter New Fields/Methods

Fields:

- private boolean hasFlees:
- private static Sector[][] worldMap = new Sector[Params.world_height][Params.world_width];

Methods:

- private static void updateWorld(Critter that) : updates world map
- private void move(int distance, int direction): modifies Critter position in world
- private static void clearFlees(): reset Flee flag
- private static boolean checkOverlap(): checks for overlapping critters
- private static void encounter(): handles encounters - fight or flee

Other Notes:

Tested and functions in Eclipse

Files do not compile in correct order when tested on remote Linux server

Tested on Linux environment using the bin files from Eclipse compile and it works