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