Game is a multiplayer online strategy playing game, but characters are programmed by users in java programming language.

## Game Analysis

Any developer can sign in, download the start package with an animal, improve it (not necessary), upload its package and begin to play.

Animals differ in several parameters. They can breed, fight, make a den, eat

Animal characteristics:

1. Size 1-10
2. Length of pregnancy 1-5 steps of the server
3. Number of newborns – max – min depends on size
4. The max age is the same for all animals.
5. Speed 1-5
6. damage depends on size
7. Table of size dependencies stored in DB

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Size | Number of newborns | Length of pregnancy  (server steps) | Max age (server steps) | Max speed  (tiles) | Damage | Initial health | Initial energy | Visibility radius (tiles) | Hearing radius (tiles) |
| 1 | 5 | 1 | 100 | 5 | 1 | 20 | 0 | 10 | 15 |
| 2 | 5 | 1 | 100 | 5 | 2 | 20 | 0 | 10 | 15 |
| 3 | 4 | 2 | 100 | 4 | 3 | 20 | 0 | 10 | 15 |
| 4 | 4 | 2 | 100 | 4 | 4 | 20 | 0 | 10 | 15 |
| 5 | 3 | 3 | 100 | 3 | 5 | 20 | 0 | 10 | 15 |
| 6 | 3 | 3 | 100 | 3 | 6 | 20 | 0 | 10 | 15 |
| 7 | 2 | 4 | 100 | 2 | 7 | 20 | 0 | 10 | 15 |
| 8 | 2 | 4 | 100 | 2 | 8 | 20 | 0 | 10 | 15 |
| 9 | 1 | 5 | 100 | 1 | 9 | 20 | 0 | 10 | 15 |
| 10 | 1 | 5 | 100 | 1 | 10 | 20 | 0 | 10 | 15 |

1. Initially energy 0 points for every animal. Energy increases when eating. 1 energy point = 1 piece of food. When Animal has 20 energy points they become 1 health point.
2. Health (so it can get killed)/Power - 20 health points
3. Date of birth() is a number of server’s step
4. Option for more.

Types of tiles:

1. Ground
2. Forest (decrease velocity for 50%)
3. Water
4. Mountains (impossible to overcome)
5. Option for more.

## Game Atmosphere

There’re simple 2D graphics. Animals differs by color on the map. On a board user can see this color and get more information on this animal (size, basic speed etc.)

Tiles differ by color.

## Game Play

1. Game principles
   1. Every user has a breed of animal for which he is responsible (there not be a problem to add more than one breed per user)
   2. Animal has a number of characteristics to be programmed (size, speed etc.)
   3. Animals don’t have experience and there are no levels in the game.
   4. The game never ends: a user can always throw to the board (wherever he chooses) an animal , 2-4 instances
   5. Animals can fight according to rules below
   6. Breeding:
      1. Animals breed when they want.
      2. After breeding one animal is pregnant.
      3. Newborns are born after time proportional to the size of animal
      4. The newborn size is the parent size
   7. Map
      1. Map is an endless / circular (like a ball) and static (map doesn’t change over time).
      2. Map is divided on locations by the natural barriers. For example mountains, water, deserts etc.
      3. Map consists of tiles. The tile has row and column, they are the address of the tile.
   8. Food
      1. All food is the same
      2. All animals eat the same food
      3. Different amount of food. Food piles on an one tile despite of its amount. Example : 300 pieces of food on a tile. Animal eat 4 pieces - 296 left.
      4. Sources of food – permanent but possibly depleted, random food
   9. The game is online and the animal plays 24/7 regardless user's online status.
   10. Sensors
       1. Can see (ability depends on animal, needs further spec)
   11. Properties of perception (Visibility/noise/smell)/Sensor-related-qualities/”radiation”:
       1. All objects in the world have “radiation” in dimensions that fit these sensors:
2. type of tiles
3. enemy nearby
4. food nearby
5. more
   1. All of these sensors have similar to real world qualities i.e. you can see only to a certain distance, depending on your height, terrain etc.
6. Actions
   1. Animals can decide to:
      1. Breed (with another animal) Breeding rules:
         1. Animals breed when they want.
         2. After breeding one animal is pregnant.
         3. Newborns are born after time proportional to the size of animal
         4. The newborn size is the parent size
         5. After breeding animals stay on the same tiles as before.
      2. Hit (another animal) . Rules for fight:
         * 1. An animal can decide to hit another animal (==bite).
           2. The damage an animal does upon hitting is proportional to it’s size.
           3. Damage is measured in absolute score (example: large animal (“lion”) does 10 points damage, mouse does 0.01. Damage points reduce “health points”
           4. Attacked animal should be in attack radius of attacking animal.
           5. Attacking animal moves to tile of attacked animal. Applying rules of moving.
           6. attack radius = speed of attacking animal
           7. formulas for calculation result :

Animal1 - attacking

Animal2 - attacked

Animal2.health = Animal2.health - Animal1.size.

* + 1. Go (speed, destination tile). Moving rules:
       1. Any animal locates on one tile.
       2. Animal can goes only orthogonal. Number of passable tiles depends on speed.
       3. Speed is an amount of tiles to cross. Speed depends on terrain. It means for some type of tiles needed more “speed points”. Example : Animal goes through 3 tiles : 2 ground tiles, 1 forest tile. It means an animal needs at least speed 4.
       4. “World” calculates the shortest way to destination tile.
       5. Speed <= max speed of an animal
       6. Animal can go through a tile with food(but not eat it), can’t go through a tile with another animal(even if same breed) or mountain or water tile.
       7. destination tile is in the visibility radius of the animal
    2. Eat (if food is nearby). Eating rules :
       1. Animal moves to the tile of food. Moving rules applied. Animal stands on a tile next to tile of food(4 orthogonal tiles). Animal can stand only on a ground and forest types of tiles. Animal can’t stand on a tile with another animal.
       2. Food addsEnergy. Animal can’t eat more than its max energy(initially 20).
    3. Rest (do nothing) = transfers energy to Life points.
    4. they always see 360, but only part of the map, they can see type of tiles and if enemy, food is nearby
  1. Physics (“world”, “System”) can decide to:
     1. Kill an animal (if a condition was fulfilled, e.g. no more life points, animal reached max age)
     2. Change the place of an animal (that decided to move, can move, depending on speed)
     3. Send input to animal’s sensors:
        1. visibility - every animal has a visibility radius measured in tiles. Visibility radius depends on size(same for now). “World” send to bot all objects in its visibility radius.Seeing means knowing all enemy animal’s characteristic.
        2. Hearing radius - every animal has a hearing radius measured in tiles. Hearing radius depends on size(same for now). Only animals can make noise. Animal attacking, movement, eating, breeding activity produces noise(same for now). “World” send to bot info that some animal(unknown size, speed etc) is on the tile(exact tile) in its hearing radius.
     4. Create new source of food:
        1. map divided by locations(group of tiles)
        2. “world” calculates the amount of food and number of animals on a location.
        3. “world” calculates the amount of food to be added. Formula : addedFood = n\*Nanimals - Nfood

n - pieces of food per Animal(configurable param in DB)

Nanimals - existing number of animals on location

Nfood - existing amount of food on location

* + 1. create newborns:
       1. Checking all pregnant animals if its length of pregnancy is expired.
       2. If length of pregnancy is expired marks the animal as non-pregnant.
       3. Creates a newborn according to the breeding rules.
       4. Newborn appears on any suitable tile next to parent.
    2. Some natural disasters? Like hurricane, epidemy, flood etc
    3. TBD more

1. User wins if there’re only his animals left and also if time.
2. Score depends on quantity of animals, size TBD
3. Initially all life points are same for all animals. Damage reduce life points, energy increases them. Some illness? TBD
4. Visual. User can see:
5. Score
6. Life points
7. Energy
8. Zoom in, out
9. Number of animals for each user’s breed
10. more