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Design Rationale

Actions

Buy

This class relates to the vending machine class. When a player is 1 distance away from the vending machine, they will be able to buy items. These items within the vending machine are fruit, vegetarian meal kits, carnivore meal kits, eggs and a laser gun. The buy action will first get the eco points of each item from the vending machine. Once this is done it will check if the player has sufficient eco points and if they do the vending machine will return the item and add the item to the players inventory.

Feed

This action is related to players feeding the dinosaurs. They must have the edible items in their inventory. If they do have the edible items, it removes the item from the inventory and it creates an eat action for the other actor.

Eat

This action is in regard to dinosaurs eating food. The eat class will first check if the food is edible. This relates to the able to eat interface. Once the check for the food is done, it gets the location of the actor and it removes the food item from that location. Once this is done it will change the nutrition level of the actor accordingly. This can only be called if the dinosaur is at the same location of an edible item, such as a fruit or bush.

Breed

The breed class is first called by breed behaviour which first makes two dinosaurs of opposite sex and also a certain food level come together to mate. Once this is achieved this class is called.

 The main purpose of this is to create an instance of an egg class. The eggs are only created after a certain number of ticks of the game is accomplished and the number of ticks is dependent on the type of dinosaur, such as stegosaurus which is 10 turns etc. Once the egg item instance is created it must be added to the map through the location class method of addItem.

Harvest

Harvests relates to players interacting with the fruit from either bushes or trees. This also links back to the harvestable interface. Once a player lands on a bush or tree there is a success rate of 40% as such this class calls a probability class which will return a randam value to determine this rate. If this value is <= 40 then a new fruit instance will be created and this fruit will be added to the actors inventory. If the success rate is unsuccessful it will return the message "You search the tree or bush for fruit but you cant find any ripe ones".

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Behaviours

BreedBehaviour
Each dinosaur has the capability of breeding. One dinosaur over a certain food level depending on the dinosaur type will call the breedbehaviour to show its ready to look for another dinosaur on the gamemap to breed with. This begins by getting all the (x,y) coordinates in the GameMap. Once all the coordinates are retrieved from the GameMap class each specific (x,y) coordinate will be searched to see if an actor is on it. Upon this, the system will check if the actor is the same species, eligible food level as well as checking if it is an adult. If these conditions are met then it will place a target on this coordinate and check to see if it's the minimum distance between all points. Once it gets the closet compatible actor it will move towards it and ultimately call the breed class which will make the egg.

HuntBehaviour
Hunt behaviour works in a very similar way to the breed behaviour. This only applies to the allosaurs as they are the only carnivores. As the allosaurs hunts for the other two dinosaurs, it utilizes the same behaviour as breed but it checks if the actor on the map is an alive stegosaur or a dead one. The getting location is to see if there are any herbivores near the allosaur, if there are any of them around them it will move towards it to attack it.

HungerBehaviour
This relates to both stegosaurus and brachiosaurus when they get hungry which is a certain food level they both have to be at. It will search through every (x,y) coordinate on the map and check the capability of the item such as having to be vegetarian. Once they find the closest, they will move towards it.

Harvesting

Bush
The bush and tree are both part of the harvestable and ableToEat interfaces.   Once a bush is eaten by a dinosaur it will return to being dirt. It does this by getting the (x,y) coordinate off the location and removes the item from the map and creates a dirt instance on that specific coordinate.

Dirt growing to bush
At the beginning of the game and each turn, each square of dirt has a 1% chance to grow a bush.

To implement this we iterate through each (x,y) coordinate of the game and get the ground value from the Location class. It then checks using the hasCapability class to see if the ground is a dirt value. If it is a dirt value, then it will call the probability class to generate a random value which will determine whether a bush will grow. If the value is less than 0.01 then we set that ground location to a new bush instance.

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Vending Machine

The Vending machine comprises of items which are laser gun and an assorted range of food. This class is linked to the buy action class. The vending machine also has the eco points allocated to each item.

Actors

Dinosaur

The dinosaur class has been extended to having three sub classes which are three different types of dinosaurs named Stegosaurus, Brachiosaur and allosaur. All these inherit specific values from the parent class Dinosaur. From this each of the dinosaurs can have specific values associated to each other.

Food

Food is a new class which is inherits the item class. The abstract food class has four sub classes which is eggs, vegetarian meal kit, carnivore meal kit and fruit. The food class also implements the AbleToEat interface.