

## Design Rationale – Lim Shir Yin, Tan Jie Yen

### Player

Players are able to choose their own names and they will get an empty Inventory and an amount of EcoPoints at the beginning of the game.

### Ground

An ArrayList of type Object will be used to hold all objects that currently existing in its coordinates eg. (1, 1) on the ground. Implementing it by using an ArrayList instead of Array is to make it mutable in size and easier for adding and subtracting. There will be two attributes in Ground objects, which is x and y coordinates. For example, a Map with width 3 and height 3 will instantiate the Ground objects with coordinates (1, 1), (1, 2), (1, 3), ...(3, 3). (1, 1) means that the first element in each tuple is x coordinate and the second element is y coordinate.

### Bush

It is one of the items contained within the Ground ArrayList. Whenever the player trying to pick the fruit from the bush, a Fruit Instance with 40% chance of success is instantiated, it will then be added to the inventory of player. There will be 50% chances of the Bush Instance to be removed if the brachiosaur steps on it. It contains fruits that can be picked by players or eaten by stegosaurus.

### Tree

It is one of the items contained within the Ground ArrayList. The dinosaur will not be able to step on the coordinates of the ground that contains Tree. Whenever the player trying to pick the fruit from the tree, a Fruit Instance with 40% chance of success is instantiated, it will then be added to the inventory of player.

### Dirt

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### World

At the beginning of the game, the player will choose the dimension, a World and GameMap will then be created based on the dimensions chosen. The Ground instance will then be created. For example, dimension such as 3x3 will create 9 ground instances, Bush Instance will then add into the Ground.

## Dinosaur

This class will be the parent class of Stegosaur, Brachiosaur and Allosaur. It will implement attributes which are type, gender, growth stage. The children class that inherited from Dinosaur class which are Stegosaur, Brachiosaur and Allosaur have almost the same methods and attributes.

A “breed” Boolean type method will be created to decide if a dinosaur is able to breed by referring their gender and growth stage. If the gender of the dinosaur is adult female and not pregnant with an egg, the “breed” method will be set to true, else it will be set to false if it is a male dinosaur or a baby dinosaur or an adult dinosaur that is pregnant.

A “numberBreedTurns” integer type method will be created to decide the number of turns of the egg breed based on their dinosaur type.

A “numberHatchingTurns” integer type method will be created to decide the number of turns of the egg hatching into baby dinosaur based on their dinosaur type.

A “numberGrowingTurns” integer type method will be created to decide the number of turns of the baby dinosaur growing into adult dinosaur based on their dinosaur type.

## Stegosaur

There will be methods inherited from Dinosaur class.

There will be attributes such as foodLevel, maxFoodLevel, hunger.etc.

Once a Stegosaur becomes unconscious, the status will change to unconscious and it will be dead after 20 turns, the corpse will remain in the location for 40 turns, then the Stegosaur instance will be removed.

The corpse can be eaten by Allosaurs, Stegosaur instance will then be removed.

## Brachiosaur

There will be methods inherited from Dinosaur class.

There will be attributes such as foodLevel, maxFoodLevel, hunger.etc.

Once a Brachiosaur becomes unconscious, the status will change to unconscious and it will be dead after 15 turns, the corpse will remain in the location for 20 turns, then the Brachiosaur instance will be removed.

The corpse can be eaten by Allosaurs. Brachiosaur instance will then be removed.

## Allosaur

There will be methods inherited from Dinosaur class.

There will be attributes such as foodLevel, maxFoodLevel, hunger.etc.

Once the food level is 0, the corpse will remain in the location for 20 turns, then the Allosaur instance will be removed.

The dinosaur being attacked by allosaur will be marked, the mark will then be removed after 20 turns. Allosaur will not be able to attack the marked dinosaur.

## Food

This class will be the parent class of Egg , Fruit and MealKit. It will implement cost method and amount of food level increased method that will be inherited by Egg, Fruit and MealKit.

## Egg

A class that inherits methods from Food class. There will be “cost” method that is inherited from the Food class. There will be “numberBreedTurns” and “numberHatchingTurns” inherited from Dinosaur class.

An egg instance will be created once an egg is bought.

If the egg is breed from female adult dinosaur, an Egg instance will be created after number of breed turns.

Once an egg is hatched based of their number of turns, the Egg instance will be removed and a Dinosaur instance will be created.

If an egg is eaten by Allosaurs, the Egg instance will be removed.

## Fruit

A class that inherits methods from Food class. There will be “cost” method and “amountFoodLevelIncreased” method that is inherited from the Food class.

A Fruit instance will be deleted after being left on the ground for 15 turns.

A Fruit instance will be deleted after being eaten by dinosaur.

A Fruit instance will be added in Inventory Java array if it is picked up by player.

A “ripe” Boolean type method will be created to decide if the fruit can be picked by player.

## MealKit

A class that inherits methods from Food class. A “type” attribute is created to decide the type of MealKit (vegetarian or carnivore). An instance of MealKit will be removed once it is eaten by Dinosaur, provided that the Dinosaur hasn’t reached the maximum of food level.

## Inventory

Inventory contains an array of items that are collected by the player. Java Array is being used as the size of inventory needs to be at a fixed size to prevent unfairness. Items are not allowed to be added once the inventory is full. Each item that is being collected consumes one space of the inventory Java array.

## LaserGun

It contains a “cost” attribute of 500 eco points. Once the amount of stegosaurus has reached at a point, laser gun will be used to attack stegosaurus, the stegosaurus instance will be removed.

## VendingMachine

A Java Array that contains the items to be sold to the players. There might be more than one vending machines on the map which it will then extend from the Ground class to fix the position.

## EcoPoint

It acts as the game currency. It doesn’t require to create a class as it can be created as an attribute in the Item class (such as Egg, MealKit, etc.). It can be added to or subtracted from after a Player makes a purchase on vending machine.