**DESIGN RATIONALE**

**Team Name: NoGroup**

**CLASSES IN THE EXTENDED SYSTEM**

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| **NEW CLASSES** | **EXISTING CLASSES** |
| *Grass* | *Dirt* |
| *Shop* | *Tree* |
| *Velociraptor* | *Protoceratops* |
| *Egg* | *Wall* |
| *Buying* | *Floor* |
| *Selling* | *WanderBehaviour* |
| *CarnivoreFood* | *FollowBehaviour* |
| *HerbivoreFood* | *Player* |

**ROLES AND RESPONSIBILITIES OF EACH SIGNIFICANTLY MODIFIED CLASS**

**Grass:**

The Grass class will be used to grow grass on a square that contains dirt. After each turn in the game, there is a small probability that grass will grow on this square. Only Protoceratops can graze on grass, and when eaten, will turn the grass square to a dirt square. Upon eating the grass, a Protoceratops will gain 5 food level.

**Shop:**

The Shop class will be instantiated and placed at the top left-hand corner of the map. If a Player is adjacent to the Shop on the map, the Player will be prompted on whether to go to the Shop or not through the message “Would you like to go to the Shop?”. If the Player selects ‘No’, then nothing happens. If the Player selects ‘Yes’, then a menu with two options will appear: Buy or Sell. This gives Player the option to either buy items from the Shop or sell items from the Player’s inventory to the Shop.

This approach offers flexibility to the user by giving them choices as to what they want to do in the game.

**Buying and Selling:**

We plan to implement a Buying class and a Selling class that will allow the player to buy items from the store, as well as sell items that exist in the player’s inventory. Each class will also contain methods that will change the balance of the owner once an item is bought/sold to the Shop.

The Player will have an initial balance upon launching the game.

When the Player wants to buy items from the Shop, a list of all of the items available will appear , as well as the current balance of the Player. When an item is bought, its value is subtracted from the Player’s balance, and an updated balance is returned.

When the Player wants to sell items to the Shop, their current inventory will appear on the screen, as well as prices associated with each item in it. The current balance of the Player will also be displayed. When an item is sold, its value is added to the Player’s balance, and an updated balance is returned.

A restriction must be placed such that if the Player wants to buy an item that exceeds the current balance of the Player, a message is returned, stating “You cannot buy this item. Item value exceeds Player’s balance.”

This approach makes our game more robust in that we restrict the Player from making unrealistic purchases in the game.

**Velociraptor and Protoceratops**:

In the case of baby Protoceratops and baby Velociraptors, we intend on creating counters that will track the age of these dinosaurs so that after they reach a certain age threshold, they will evolve into adult Protoceratops and adult Velociraptors, as well as obtain the ability to breed.

If a Velociraptor is above a specific food level, it will be in Wander mode. Similarly, a Protoceratops will be in Wander mode when it is above a specified food level. If the food level of each type of dinosaur drops to a value that is less than or equal to a specified value, each dinosaur will go into Follow mode. In Follow mode, a Protoceratops will start moving towards the nearest plant source, whether it be grass or trees. On the other hand, a Velociraptor will start moving towards the nearest live Protoceratops.

If a Protoceratops lies within a Velociraptor’s specified kill radius (yet to be determined), the Velociraptor will attack, and the Protoceratops will die.

**Egg:**

If a Protoceratops has a food level greater than some specified value, then it has a chance to lay an egg. Our system will also incorporate Velociraptor breeding such that if a Velociraptor’s food level is greater than some specified value, it will also have a chance to lay an egg. Despite different types of dinosaurs laying different types of eggs, each egg will share the same characteristics. After a certain number of turns, the egg will hatch into a baby dinosaur where each dinosaur will inherit characteristics based on the dinosaur where the egg came from.

**Tree:**

The Tree class will be used to grow trees on squares that are adjacent to ones that already exist in the game. After each turn in the game, there is a small probability that a tree will grow next to one that already exists. Only Protoceratops can graze on trees, and when eaten, will remove the tree from the map. Upon eating a tree, a Protoceratops will gain 10 food level.

**HerbivoreFood:**

The HerbivoreFood class serves as a physical object that can be either hand-fed to a Protoceratops or dropped on the ground next to a Protoceratops. If a Player is adjacent to a Protoceratops, the Player will be prompted if they want to feed this dinosaur. If the Player selects ‘No’, then nothing happens. If the Player selects ‘Yes’, then the herbivore food is removed from the Player’s inventory. The dinosaur’s food level goes to maximum level once it is consumed.

**CarnivoreFood:**

The CarnivoreFood class serves as a physical object that can be either hand-fed to a Velociraptor or dropped on the ground next to a Velociraptor. If a Player is adjacent to a Velociraptor, the Player will be prompted if they want to feed this dinosaur. If the Player selects ‘No’, then nothing happens. If the Player selects ‘Yes’, then the carnivore food is removed from the Player’s inventory. The dinosaur’s food level goes to maximum level once it is consumed.

**ADDITIONAL INFORMATION:**

**Tagging:**

If the Player is adjacent to any live Protoceratops or Velociraptor on the map, the Player will be prompted on whether to tag the dinosaur or not. If the Player selects ‘No’, then nothing happens. If the Player selects ‘Yes’, then the Player’s inventory will be checked to see if they have a dinosaur tag. If a tag does not exist in the Player’s inventory, then a message will appear saying “You do not have a dinosaur tag!”. Once a dinosaur tag is used, it will disappear from the Player’s inventory.

Since each type of dinosaur has a different maximum food level, enabling the option for them to be tagged will differ. A Protoceratops can only be tagged if their food level is above a specified value. and a Velociraptor can be tagged if their food level is above another specified value.