**Design Rationale**

**Crafting weapons**

A Player now has the capability to craft weapons when holding a zombie limb. To detect if a Player is in possession of a limb and thus able to craft a weapon, we added an additional behaviour to the Player class titled CraftBehaviour. This class implements the Behaviour interface.

If the Player is holding a ZombieLimb, the Player can execute CraftAction. CraftAction is inherited from Action. This removes the instance of ZombieLimb and creates an instance of the ZombieWeapon class and puts it in their possession.

CraftAction can create two different instances of ZombieWeapon depending on the instance of ZombieLimb the Player is holding.

**ZombieClub and ZombieMace**

ZombieClub is crafted when the player is holding ZombieArm and ZombieMace is crafted when the Player is holding ZombieLeg. These are the two instances of the ZombieWeapon class, inherited from WeaponItem. ZombieClub has damage points of 30, ZombieMace has damage points of 40.

**Creating the Farmer**

The Farmer character is an extension of a Human with the additionally capability to sow crops, fertilize crops and harvest the crops for food.

To achieve this, we’ve:

* Created a class Farmer that extends Human
* Created the FarmerBehaviour class which the Farmer can have
* Created classes FertilizeAction, HarvestCropAction and SowingAction allowing Farmers to execute these capabilities

**Creating the Farmer’s capabilities**

To action the Farmer’s capabilities, we need to know if they are in range of dirt, crops, or food. The FarmerBehaviour class implements the Behaviour interface and is dependent on the Location class. This allows the Farmer to detect if it can execute the appropriate actions based on its location.

When standing next to a patch of dirt, a Farmer has a 33% chance of sowing a crop in it. To sow the SowingAction class was created. This occurs on every Farmer’s turn.

To fertilize an unripe crop the class FertilizeAction was created. Now when the Farmer is standing on an unripe crop, it can fertilize it, decreasing the time left to ripen by 10 turns (decrease UnripeCrop age by 10).

To harvest a ripe crop the class HarvestCropAction was created. Now when standing on or next to a ripe crop, a Farmer can harvest it for food. If a Farmer harvests the food, it is dropped to the ground.

FertilizeAction, HarvestCropAction and SowingAction are all inherited from the Action class in the Engine.

To interact with crops and food we needed to create classes to interact with.

*\*\*\* Assumption: We have interpreted this feature as:*

* *If a Farmer harvests a ripe crop, the ripe crop is replaced with food and is dropped to the ground*
* *A player can harvest food, placing it in the player’s inventory*
* *A player cannot harvest a ripe crop*
* *We were unsure if ripe crop = food, so we have said they are not the same and implemented the above*

**Creating the UnripeCrop, RipeCrop and Food class**

The UnripeCrop class is instantiated when a Farmer successfully sows a crop on a patch of dirt. Left alone it will ripen in 20 turns. Therefore, when the age of the UnripeCrop reaches (or surpasses) 20, the UnripeCrop is removed and a RipeCrop is created. The UnripeToRipeCrop class is responsible for this and is associated with the RipeCrop class. A Farmer can use FertilizeAction to speed up the aging progress.

The RipeCrop class can be harvested by a Farmer using HarvestCropAction, creating an instance of the Food class. The Food will be dropped to the ground and the RipeCrop instance is removed.

UnripeCrop and RipeCrop are inherited from the abstract Ground class. The Food class is inherited from Item.

**Players, Humans and Food**

*\*\*\* Assumption: Features state that only a Player can harvest food and place it inventory, but next feature mentions food can be eaten by damaged humans. We have assumed Humans are thus able to pick up food and store in inventory (therefore also farmers and players).*

*\*\*\* Assumption: A Human can harvest food if standing on or next to food.*

Humans can harvest food and as a result store the item in their inventory. We have included an additional behaviour to the Human class titled HarvestBehaviour. This class implements the Behaviour interface and is dependent on the Location class. It detects if the Human is standing next to or on Food. If this condition is met the Human can execute HarvestFoodAction. This class allows Humans to place the food in their inventory. HarvestFoodAction is inherited from Action.

To determine if Food is in the Human’s inventory FoodBehaviour class was created. If the criteria are met, the Human can eat the food by executing the EatFoodAction, a class inherited from Action. Eating food recovers the Human’s health by 20 points (-20 damage points). Eating the Food removes the Food instance.

**Rising from the dead**

When a Human is killed its capability is set to dead.

After a Human is killed, its corpse should rise from the dead as a Zombie 5-10 turns later.

RiseFromDeadAction inherits Action