

Design Rationale for Requirement 2

Blacksmith

The blacksmith is an NPC character with similar characteristics to that of the traveller that was completed in Assignment 2. For its implementation, the blacksmith extends the Trader class. Since the blacksmith is immobile, the abstract class returns the DoNothingAction in each turn.

The blacksmith is responsible for upgrading the items at a price which is constant for each instance of the item.

Upgrade Action and Upgradeable Interface

An upgradeable interface was created, and all upgradeable items were implemented, this gave them all an upgrade method which could be called the UpgradeAction.

By creating an interface, the Dependency Inversion Principle was satisfied, as UpgradeAction is only dependent on the Upgradeable interface, rather than the individual classes which implement this interface. Therefore, it is insulated from change at a low level.

Once the player is in the vicinity of the blacksmith, the player gets the option to upgrade certain items in their inventory. Since each item is responsible for its upgrade, it aligns with the Single Responsibility Principle.

For items such as the Healing Vial and Refreshing Flask, a boolean is present in the class to check whether they have been upgraded once prior. Only when the actor has the capability to upgrade and when the boolean conditions are met, does the upgrade action display. The variables of Healing Vial and Refreshing Flask were both static which meant the numeric change would reflect across all instances of the entity. They had to be refactored to be just private variables

For the Broadsword, since the focus skill cannot increase the upgrade, the damage method of WeaponItem has been overridden to

The execute method for the UpgradeAction checks the actor's balance and the upgrade price of the item, only if the actor has enough balance is the action executed. Otherwise, a message pops up informing the user of the same.

This approach also satisfies the Open/Close Principle as more upgradeable items can be added simply.

Since there was only main one action in this requirement, the upgrade of the Healing Vial was shown in the sequence diagram.