

# **FIT2099 Assignment 3**

## **Applied Session 4 Group 8**

### **Updated Design Rationale**

Group Members:

Wee Jun Lin (32620861)

Kok Tim Ming (32619138)

Lau Ka-Kiat (32967136)

<b>Overview</b>	<b>4</b>
Design goals	4
Notes	4
<b>Requirement 1</b>	<b>5</b>
Brief	5
Grounds	6
Cliff	6
GoldenFogDoor	6
SiteOfLostGrace	6
Activateable	6
Travelling	7
Travelable	7
TravelManager	7
Actions	7
TravelAction	8
ActivateAction	8
<b>Requirement 2</b>	<b>9</b>
Brief	9
Grounds	9
Cage	9
Barrack	10
WestEnemyFactory & EastEnemyFactory	10
Enemies	10
Dog	10
Godrick Soldier	10
Behaviors	11
AttackBehaviour	11
Weapons	11
<b>Requirement 3</b>	<b>12</b>
Brief	12
Godrick the Grafted	12
GodrickTheGrafted	12
AxeOfGodrick, GraftedDragon	12
RemembranceOfTheGrafted	13
Transactions	13
Exchangeable	13
ExchangeAction	13
Sellable	13
FingerReaderEnia	14
GoldenRune	14
HP upgrade functionality	14
<b>Requirement 4</b>	<b>15</b>
Brief	15

New Archetype	15
Astrologer	15
AstrologerStaff	15
Allies/Invaders	16
SummonSign	16
Ally	16
Invader	16
Summoner	16
SummonAction	16
<b>Requirement 5</b>	<b>18</b>
Creative Requirement: Dialogues with other Actors (NPCs)	18
Brief	18
Implementation	18
Summary	18
DialogueSystem	19
Dialogue	19
Choice	19
DialogueEffect	20
DialogueAction	20
dialogueLibrary (package)	20
KaleDialogue	20
EniaDialogue	20
GostocDialogue	21
HuTaoDialogue	21
ShutenDoujiDialogue	21
HuTao	21
GateKeeperGostoc	21
ShutenDouji	21
Chisui	21
Bloodsuck	21
Note	22
<b>Contribution Log Link</b>	<b>23</b>

# Overview

## Design goals

Our main objective involves designing an extensible codebase around the existing Elden Ring game engine. To achieve this, design goals have been set to be faithfully adhered throughout the whole design and development process.

### We strive to:

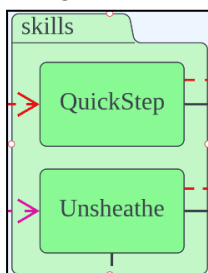
- Reduce code redundancy (DRY): Achieve through abstractions to reuse code. This will make the codebase more concise and easier to maintain.
- Avoid multiple inheritance (diamond problem): Done by abstracting methods through interfaces (ISP) or utilising composition.
- Create an extensible codebase, accounting for future feature additions and development. Classes and modules should only be made to be extended (OCP).
- Follow the Interface Segregation Principle (ISP). This will prevent unused code and will make adding new features easier as no refactoring is needed.
- Follow Single Responsibility Principle (SRP): each class should only have one responsibility so that it is more focused. This will make the codebase easier to be extended with new functionality and easier to maintain.


## Notes

Classes that were not modified from previous REQs will not be discussed in the rationale.

All Full UML diagrams and Dialogue Trees are attached at the end of this document.

Newly added classes will be coloured in **green** . Fill colour contrast will increase along with package hierarchy depth.

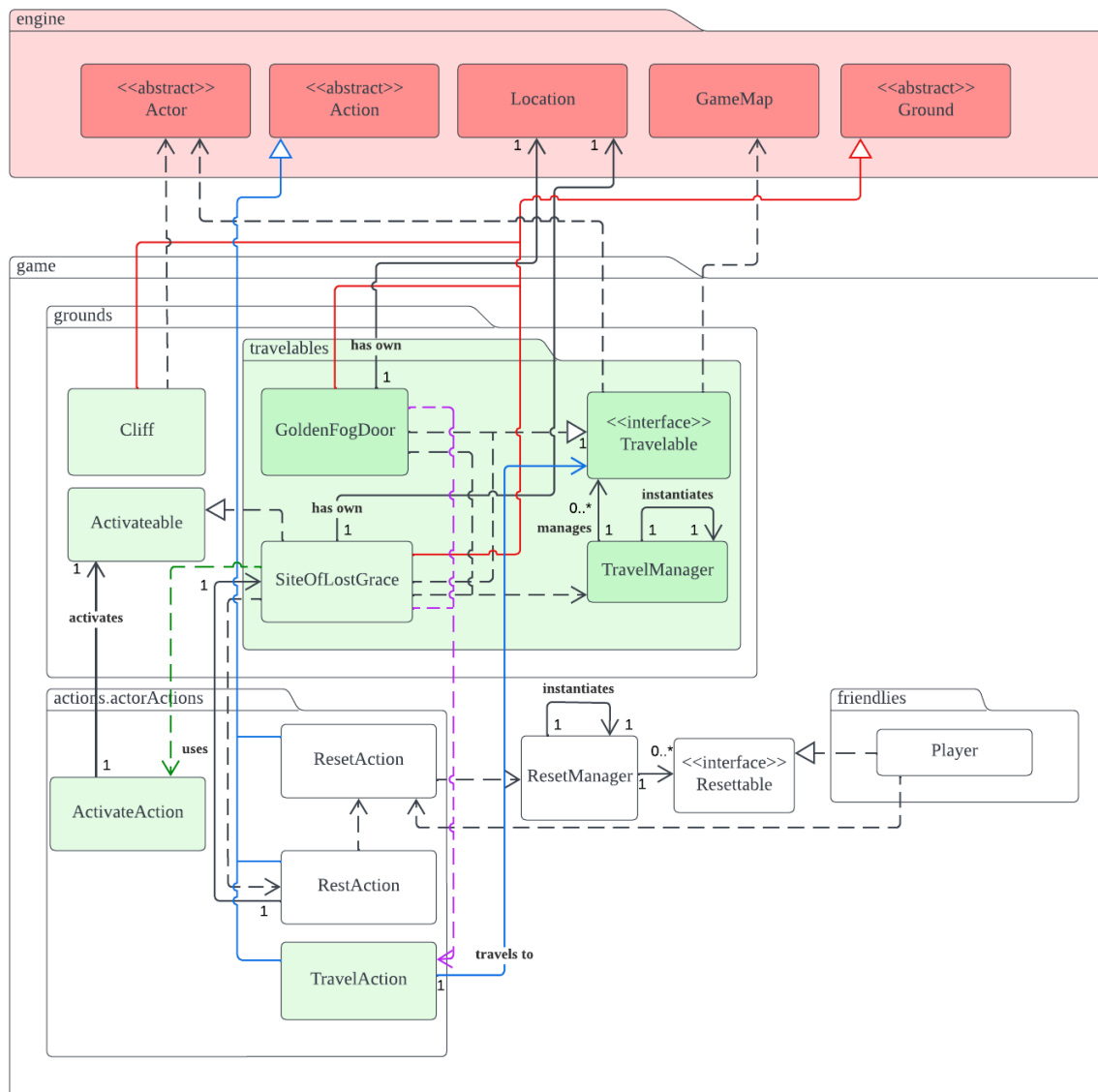


Classes with **no fill** are classes that will not be extended/modified from the previous requirements and assignments. Classes coloured in **red**  are engine classes.



# Requirement 1

## REQ1: Travelling between Maps



## Brief

The diagram represents an object-oriented system for requirement 1. It now has 7 new concrete classes and 1 new interface categorised into their respective packages. Related classes that were previously shown in previous requirements/parts are connected to the extended classes to provide some functionality context.

## Grounds

### Cliff

*Cliff* is a new class that inherits from the abstract *Ground* class (DRY, LSP). *Cliff* will handle the damage inflicted to *Actors* that step on it, not requiring any modification to existing classes (OCP, SRP). The capability *enum* is utilised to filter enterable actors (OCP).

### GoldenFogDoor

*GoldenFogDoor* is a new class that inherits from the abstract *Ground* class (DRY, LSP). *GoldenFogDoor* has an association to location and inherits the *Travelable* interface (ISP). This allows the *GoldenFogDoor* to handle the travelling functionality by itself (SRP). *GoldenFogDoor* will also be responsible for providing the *Actors* the *TravelAction*, connected to the travelling network (pairs) managed by [TravelManager](#).

### SiteOfLostGrace

*SiteOfLostGrace* is a carried over class from previous requirements that received extensions. The revamped version of *SiteOfLostGrace* now implements *Travelable* and *Activateable* (ISP, OCP). This allows *SiteOfLostGrace* to handle the travelling functionality and activation functionality by itself (SRP). *SiteOfLostGrace* can be activated dynamically for fast travel (*TravelAction*) and the resting (*RestAction*) functionality through *ActivateAction*. When a site is activated, it will be registered with other activated sites in the travelling network (through [TravelManager](#)).

Player respawn was not implemented as it was an optional requirement, and due to time constraints.

### Activateable

An interface class implemented by classes that can be activated, forming a contract for common methods like *activated()*. The use of polymorphism also ensures that the Open-Closed Principle is not violated as no other classes are needed to be modified.

Instead of creating the activation functionality just to cater *SiteOfLostGrace*, the *Activateable* interface can be used for other game objects in the future to allow for creative activation effects (OCP). This includes features like activating a trap door, activating doors that link to another, which is why *Activateable* was implemented as an interface to open up the doors for future extensions (OCP, LSP, ISP). One downside of implementing *Activateable* as an interface is that the implementing-classes need to define the activation functionalities by themselves (location attribute, etc). However, as explained earlier, this provides flexibility for defining different activation effects (OCP).

# Travelling

## Travelable

An interface class implemented by classes that can be travelled to and from, forming a contract for common methods like *travel()*. The use of polymorphism also ensures that the Open-Closed Principle is not violated as no other classes are needed to be modified.

In the future, there might be any game objects that can be used as travel points. This includes features like intentionally placing a *Travelable* item as a fast travelling waypoint, hurting the *Actor* when travelling, granting status effects etc. As such, *Travelable* as an interface opens up the doors for future extensions (OCP, LSP, ISP). One downside of implementing *Travelable* as an interface is that the implementing-classes need to define the travel functionalities by themselves (*location* attribute, etc). However, as explained previously, this provides flexibility for defining different travelling effects (OCP).

## TravelManager

The *TravelManager* class follows a Registry & Singleton pattern. This approach provides a centralised control and access point among *Travelling* points, reduced coupling between other classes, allows for code reusability and simplifies object retrieval.

*TravelManager* will store a network of associations. A network contains a list of associated *Travelables*. These associations represent the two-way connections that each *Travelable* has to each other, where a *Travelable* can choose to associate itself with a network using a key that represents the network (like a network ID) in a HashMap.

Though the approach of retrieving a *Travelable*'s associated network using a network ID creates Connascence of Meaning, it is thought of to be one of the most optimal system tradeoffs that this design must carry in order implement *Travelables* that can associate with many networks (not just one).

While the Registry & Singleton pattern makes things relatively easy to implement, the approach could come across as controversial as it causes tight coupling along with encapsulation problems between *TravelManager* and other dependent objects. The approach could promote the violation of SRP as the application extends (god class) and if good coding practices are not exercised in the future. As the *TravelManager* class grows, the violation of SRP could likely be avoided by utilising composition, hence adhering to OCP and SRP by encouraging segregation of functionality.

## Actions

*TravelAction* and *ActivateAction* extends the abstract *Action* class to enforce common methods, allowing for polymorphism through abstractions (DIP).

## TravelAction

*TravelAction* will have an association with *Travelable* Interface. This allows *TravelAction* to invoke the *Travelable* interface's methods when executed, adhering to SRP and ISP in implementing-classes.

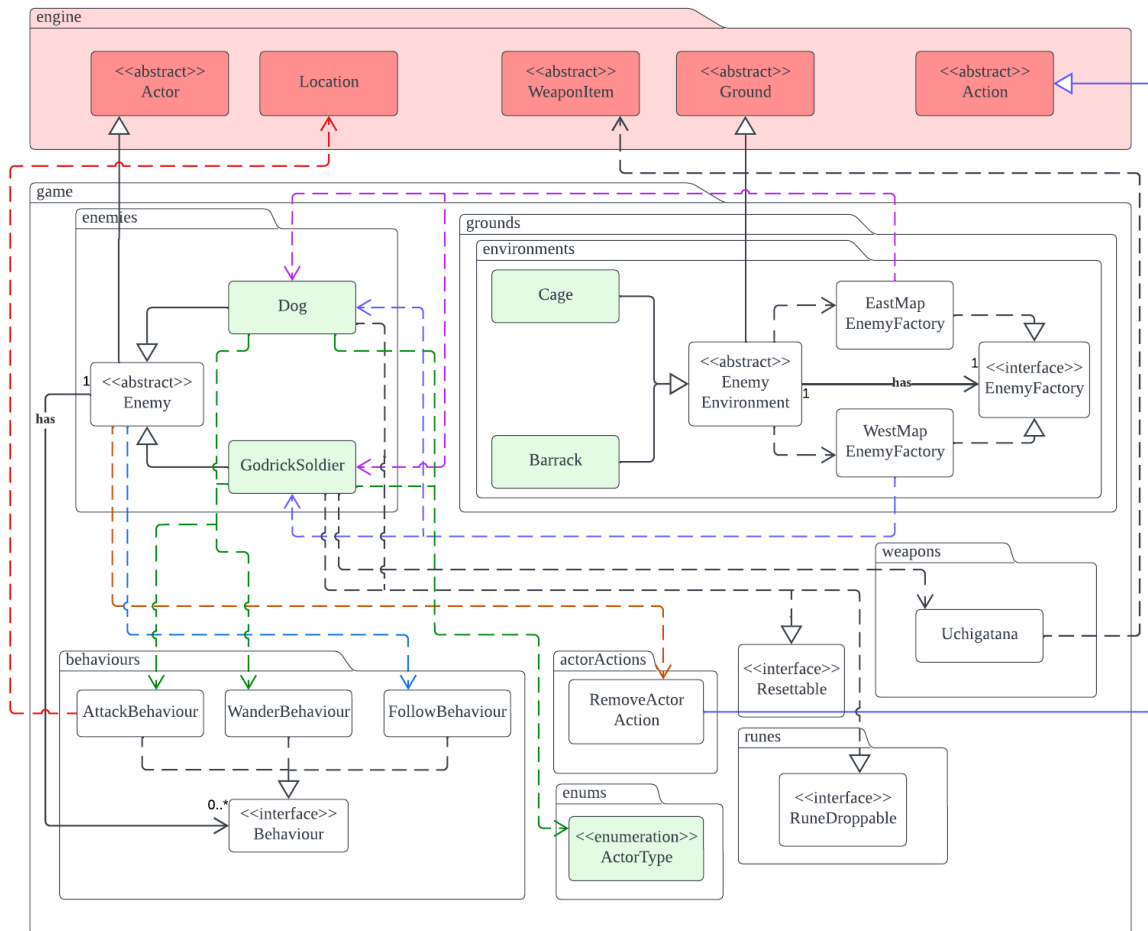
## ActivateAction

*ActivateAction* will have an association with *Activateable* Interface. This allows *ActivateAction* to invoke the *Activateable* interface's methods when executed, adhering to SRP and ISP in implementing-classes.



## Requirement 2

## REQ2: Inhabitant of the Stormveil Castle



## Brief

The diagram represents an object-oriented system for requirement 2. It now has 5 new concrete classes categorised into their respective packages. Related classes that were previously shown in previous requirements/parts are connected to the extended classes to provide some functionality context.

## Grounds

Cage

*Cage* is a new class that inherits from the abstract *EnemyEnvironment* class (DRY, LSP). No modifications to existing classes were required for this class to spawn the *Dog* enemy (OCP, SRP).

## Barrack

*Barrack* is a new class that inherits from the abstract *EnemyEnvironment* class (DRY, LSP). No modifications to existing classes were required for this class to spawn the *GodrickSoldier* enemy (OCP, SRP).

## WestEnemyFactory & EastEnemyFactory

Enemy factories were changed from the previous implementation. The previous implementation uses *ActorType* enumeration to determine the enemy to spawn, but since Stormveil Castle enemies do not make use of the cardinal directions, it is a bad practice to create enumerations for specific enemy identities to make the spawning system work correctly.

The feedback provided in A2 suggests that new template methods like *createDog()* in the enemy factory be set as a contract in the *EnemyFactory* interface class. However, our implementation preferred utilising static char representations defined by the *EnemyEnvironment* subclass itself as a key to spawn the associated enemy as it improves extensibility. Also, if the recommendations from feedback were followed, it is difficult to implement in our current design of *EnemyEnvironment*, as all the environment classes would need to be modified (possible violation of OCP) to spawn their specific enemies (*getSkeleton()* in *Graveyard*, *getCrustacean()* in *PuddleOfWater*, etc) instead of only *getEnemy()* in *EnemyEnvironment*.

Utilising the static char representations also allows for a centralised control of spawning, and when modifications are needed, only the central node is required to be modified (in our case, *EnemyFactory* subclasses), improving maintainability.

## **Enemies**

In this requirement, Stormveil Castle enemies are shown to have a dependency on *ActorType* to emphasize that they are the same enemy type. Thus, they can dynamically filter the *Actors* to attack in *AttackBehavior* with *ActorType.STORMVEIL\_CASTLE* (OCP). Same applies for other *Enemy* classes.

## Dog

*Dog* is a new enemy that extends from the *Enemy* class (DRY, LSP). Adding this class requires no new modifications to the existing classes (OCP).

## Godrick Soldier

*GodrickSoldier* is a new enemy that extends from the *Enemy* class (DRY, LSP). Adding this class requires no new modifications to the existing classes (OCP). In this requirement, *HeavyCrossbow* was not implemented as it is an optional requirement, and due to time constraints. *GodrickSoldier* was provided with *Uchigatana* instead.

## Behaviors

### AttackBehaviour

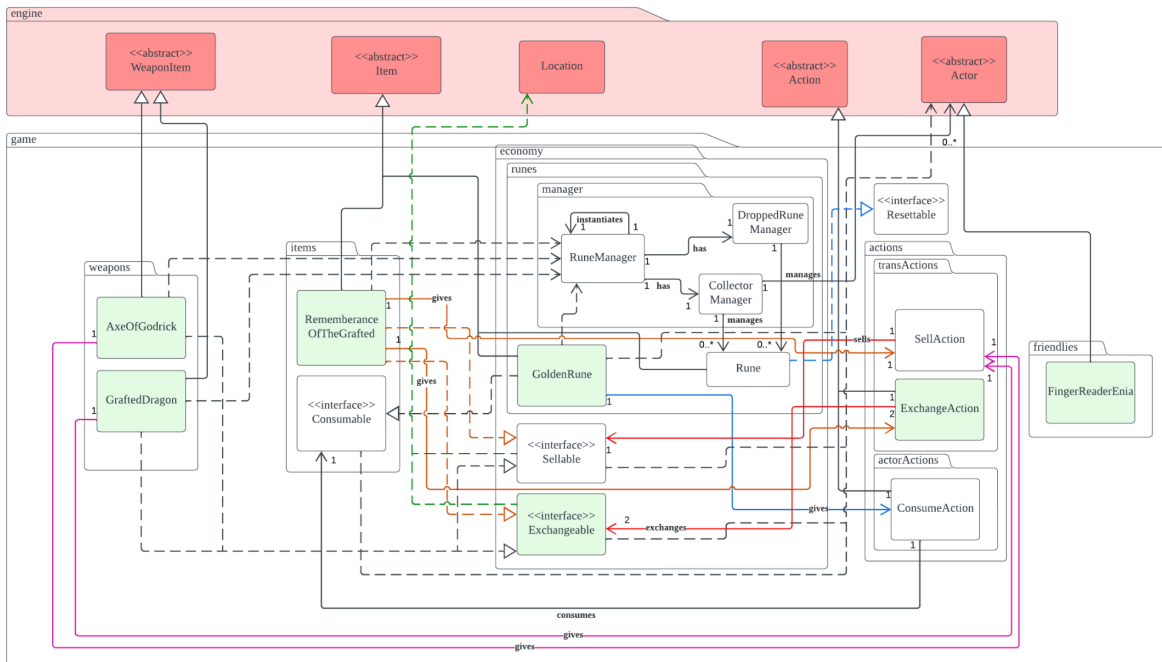
Attempts to get a random valid target (filtering restricted enums, like *ActorType.STORMVEIL\_CASTLE*) in surroundings and performs 50/50 attack/special attack. This design allows actors to dynamically define their targets without needing any modifications (OCP). The current implementation of *AttackBehavior* is very simple, but in the future better algorithms (behavior concrete classes) could be easily implemented based of the *AttackBehavior* abstract class (LSP, OCP, DRY).

### Weapons

Weapons were not implemented as it is an optional requirement, and due to time constraints.

# Requirement 3

REQ3: Godrick the Grafted



## Brief

The diagram represents an object-oriented system for requirement 3. It now has 6 new concrete classes and 1 new interface categorised into their respective packages. Related classes that were previously shown in previous requirements/parts are connected to the extended classes to provide some functionality context.

## Godrick the Grafted

### GodrickTheGrafted

Godrick the Grafted was not implemented as it is an optional requirement, and due to time constraints.

### AxeOfGodrick, GraftedDragon

These weapons extend the abstract *WeaponItem* class (DRY, DIP) and were implemented without skills as it is an optional requirement, and due to time constraints. These two classes implement the *Exchangeable* interface, but are not dependent on *ExchangeAction* as they do not provide the *Action*. These abstractions also allow for polymorphism (DIP).

## RemembranceOfTheGrafted

This class extends the abstract *Item* class (DRY) and implements the *Exchangeable* interface. It is dependent on *SellAction* and *ExchangeAction* as it provides the *Actions* for holders. These abstractions also allow for polymorphism (DIP).

## Transactions

### Exchangeable

An interface class implemented by classes that can be exchanged for another item, forming a contract for common methods like *exchangeIn()* or *exchangeOut()*. The use of polymorphism also ensures that the Open-Closed Principle is not violated as no other classes are needed to be modified.

In the future, there might be any game objects that can be exchanged for any other game object. This includes exchanging an item for a weapon, or vice versa, allowing *Exchangeable* concrete classes to define unique effects that will happen when exchanging game objects (OCP, LSP, ISP). One downside of implementing *Exchangeable* as an interface is that the implementing-classes need to define the exchange functionalities (in and out) by themselves. On the other hand, this approach provides flexibility for defining different exchanging effects (OCP).

It is important to note that in the current implementation, actors (or more specifically traders) will provide the holder the ability to exchange the *Exchangeable* object only if the trader has a specific *Capability enum*, and that they are nearby the holder. Every trader will also be limited to exchanging the same *Exchangeable* object defined in the *Exchangeable* object itself. This is a limitation of the implementation, given the game engine provided.

### ExchangeAction

*ExchangeAction* extends the abstract *Action* class to enforce common methods, allowing for polymorphism through abstractions (DIP).

*ExchangeAction* will have an association with *Exchangeable* Interface. It is a two way association, *exchangeableIn* and *exchangeableOut*. This allows *ExchangeAction* to invoke the respective *Exchangeable* interface's methods *exchangeIn()* or *exchangeOut()* when executed, adhering to SRP and ISP in implementing-classes.

### Sellable

An interface class implemented by classes that can be sold, forming a contract for common methods like *sell()*. The use of polymorphism also ensures that the Open-Closed Principle is not violated as no other classes are needed to be modified. Having the *Sellable* interface on its own also encourages the Liskov Substitution Principle (LSP), as this ensures inheritance hierarchy is correctly designed and implemented.

Following the feedback, *Sellable* interface subclasses (*SellableWeapon*, *SellableItem*) were revamped into *Sellable* on its own, meaning that the implementing-classes need to define the sell functionalities by themselves rather than relying on default methods provided by the niche-interfaces before. This can lead to the violation of the DRY principle, but it is a justifiable trade-off for better maintainability and flexibility by avoiding over-abstraction. In the future, *Sellable* objects can also define different selling effects (OCP).

### FingerReaderEnia

*FingerReaderEnia* extends *Actor* (DRY), and has *Capabilities* to allow other actors to sell and to exchange the *RemembranceOfGrafted*.

### GoldenRune

*GoldenRune* extends *Item* (DRY) and implements *Consumable* (ISP). This allows the re-usage of *ConsumeAction* (OCP). *GoldenRune* does not inherit from *Rune* because *Rune* has very different functionalities in the implementation (LSP). The abstractions also allow for polymorphism (DIP).

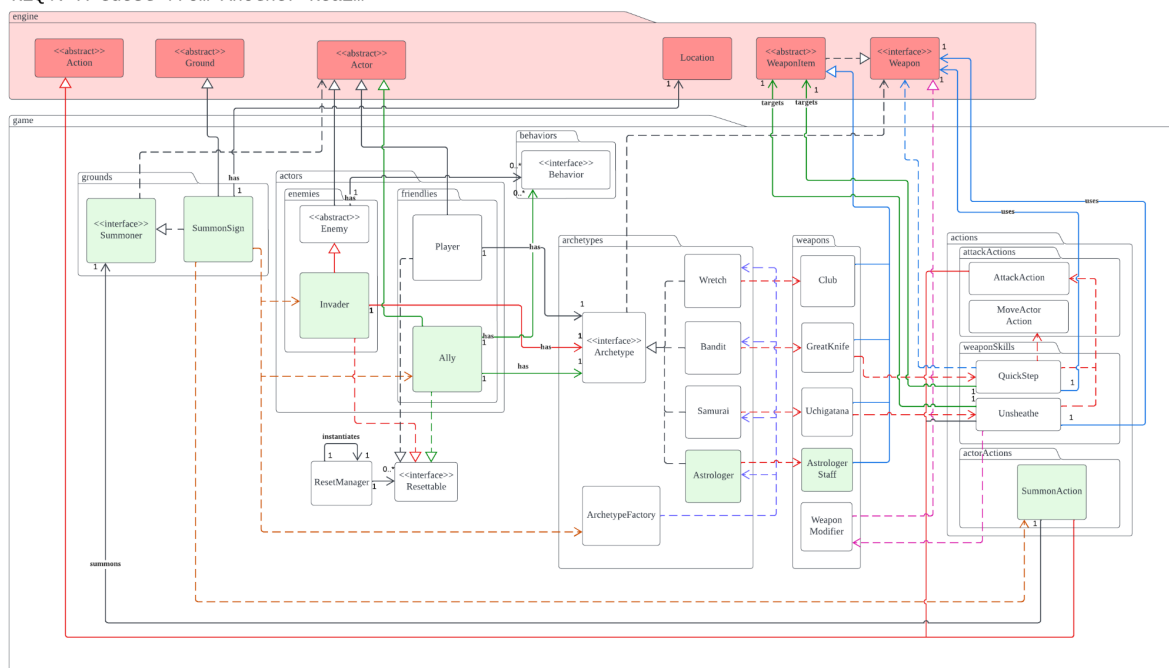
*GoldenRune* has an association with *ConsumeAction* because it is required to not give the actor the action when the *GoldenRune* is not in the *Actor*'s inventory. This is done through the tick method provided by *Item* (ISP, DRY). *GoldenRune* defines its own *consume()* method (extensible, OCP): it updates the collector's runes in the *RuneManager* when *consume()* is called.

### HP upgrade functionality

*SiteOfLostGrace* HP upgrade functionality was not implemented as it is an optional requirement, and due to time constraints.

## Requirement 4

#### REQ4: A Guest from Another Realm



## Brief

The diagram represents an object-oriented system for requirement 4. It now has 6 new concrete classes and 1 new interface categorised into their respective packages. Related classes that were previously shown in previous requirements/parts are connected to the extended classes to provide some functionality context.

## New Archetype

## Astrologer

A new *Astrologer* archetype is added that implements the *Archetype* interface (DRY, LSP). This inheritance allows for polymorphism in implementing-classes (DIP). No further modifications are required to the existing classes and codebase (OCP).

AstrologerStaff

The *AstrologerStaff* extends *WeaponItem* to inherit common methods (DRY). It was implemented without the ranged attack component as it is an optional requirement, and due to time constraints.

## Allies/Invaders

### SummonSign

This class extends from the *Ground* class (DRY), and implements the *Summoner* interface to handle the summoning feature (ISP). These abstractions open up opportunities for polymorphism, adhere to DIP. *SummonSign* will provide the *SummonAction*. On summon, it spawns 50/50 Ally/Invader with *RandomNumberGenerator* and *ArchetypeFactory*'s *randomArchetype* method.

### Ally

*Ally* is a new class that inherits from the *Actor* class (DRY) and implements *Resettable* (ISP). It has behaviors (hence the association). This inheritance allows for polymorphism (DIP). *Ally* will also store the *Archetype* as an attribute, as it is expected to be able to grow stronger based on the *Archetype*, as it gains experience in the future.

### Invader

*Invader* is a new class that inherits from the *Enemy* class (DRY), implements *Resettable* and *RuneDroppable* (ISP). *Invader* will also store the *Archetype* as an attribute, as it is expected to be able to grow stronger based on the *Archetype*, as it gains experience in the future. *Invader* was made to inherit the *Enemy* abstract class since it has similar behaviors to other enemies (i.e., follow when a *PROVOKER* is in exits). While it is possible that *Invader* could be made to inherit *Actor* instead, *Enemy* reduces code duplication (DRY) and enforces code consistency through refactoring, at the cost of deeper abstraction.

### Summoner

An interface class implemented by classes that can summon game objects, forming a contract for common methods like *summon()*. The use of polymorphism (DIP) also ensures that the Open-Closed Principle is not violated as no other classes are needed to be modified.

In the future, there might be any game objects that can be summoned by the *Summoner*. It could summon a dropped *Item*, *Weapon*, *Ground*, *Actor* or any future game objects. With the interface, *Summoner* concrete classes can define all sorts of creative effects flexibly (OCP, LSP, ISP), and have the creative effects executed when *SummonAction* is called. Though, one small trade-off for implementing *Summoner* as an interface is that the implementing-classes need to define the summon functionalities (in and out) by themselves.

### SummonAction

*SummonAction* extends the abstract *Action* class to enforce common methods, allowing for polymorphism through abstractions (DIP).

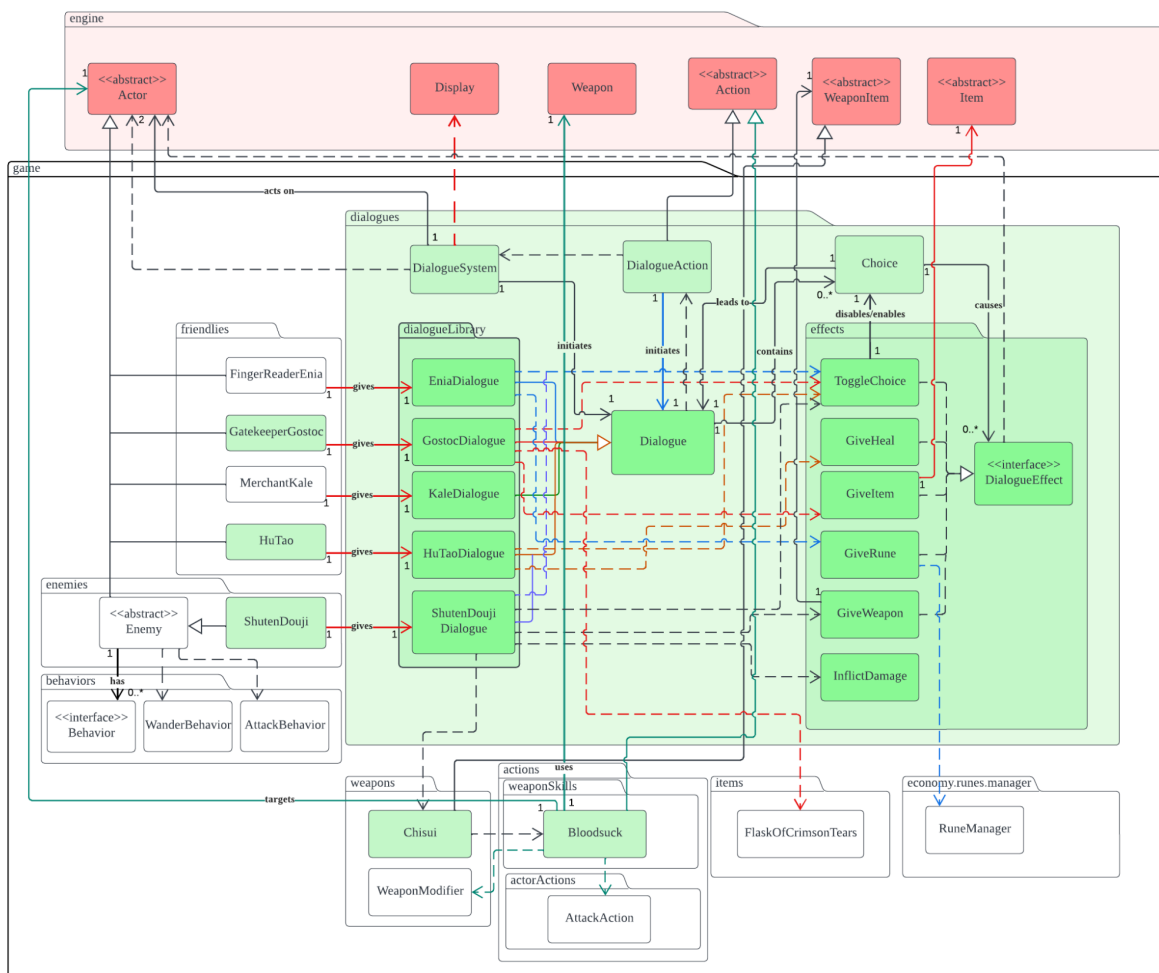
*SummonAction* will have an association with *Summoner* Interface. This allows *SummonAction* to invoke the *Summoner*'s method *summon()* when executed (DIP), allowing



*Summoner* to define creative effects, adhering to SRP, ISP and OCP in implementing classes.

## Requirement 5

### REQ5: Creative Requirement (Dialogue with NPCs)



### Creative Requirement: Dialogues with other Actors (NPCs)

## Brief

The diagram represents an object-oriented system for requirement 5. It now has 20 new concrete classes and 1 new interface categorised into their respective packages. Related classes that were previously shown in previous requirements/parts are connected to the extended classes to provide some functionality context.

## Implementation

## Summary

*Dialogues* with other actors (NPCs) were chosen to be implemented as the creative requirement. This was chosen because *Dialogues* are an intrinsic part of games that provide

deeper immersion, especially when Players are given the option to affect the course of events and end with different *Dialogue* outcomes.

The architecture follows a branching dialogue system, or sometimes it can be cyclic, thus a cyclic graph would be a good representation of the code structure. While not strictly defined, *Dialogues* can be visualised as nodes, *Choices* for edges, and the *DialogueSystem* being the encompassing graph. However, it is important to note that the *Dialogues* are not stored in a 'database', but rather all are initialised in the starting *Dialogue* node (from the *dialogueLibrary*), and are linked to each other by *Choices*.

This feature will allow the player to interact with different NPCs in the game and choose from various dialogue options (*Choices*). The *Choices* will lead to different outcomes (*Dialogue*) and cause different effects (*DialogueEffect*) for the player. In the implementation, unique events like giving weapons, items, runes, healing/damaging the player and toggling availability of *Choices* was demonstrated. The *Dialogues'* choices will also provide some game lore, potentially pulling in player interest.

## DialogueSystem

The *DialogueSystem* concrete class was created to handle the complete execution of a *Dialogue*. The class handles the operations and flow of a *Dialogue* tree (encouraging SRP), like displaying the available choices, handling user input and choice outcomes.

This class is more of a utility class, one that resembles the *Menu* engine class. While the *Menu* class could be reused, we desired a cleaner and more dedicated class like the *DialogueSystem*.

## Dialogue

The *Dialogue* class enables choice-based dialogues in the game. It consists of a message attribute, which holds the dialogue message, and a list of choices that the player can make. *Choices* in the *Dialogue* class follow the composition pattern, allowing for future complex and flexible *Choice* manipulations (OCP, ISP, DIP). The *Dialogue* class also handles the presentation of different assigned choices to the player on its own (SRP).

While *Dialogues* could be made into abstract classes, it was not necessary as it could be used as-is. This avoids over-abstraction and potential creation of a god class (violates SRP).

## Choice

The *Choice* class represents an option within a *Dialogue*. If available, it provides the player with a *Choice* to select within a *Dialogue*, which when selected can lead to different events, to other *Dialogues*. Each *Choice* has a description and can trigger one or more effects (*DialogueEffect*) when selected. This means the *Choice* class must maintain a reference to the next *Dialogue*.

*Choices* follow the composition pattern, allowing for future complex and flexible *DialogueEffect* manipulations and additions (OCP, ISP, DIP). When a *Choice* is selected,

Choice calls every attached *DialogueEffect*'s method *trigger()* to trigger the unique effect, promoting DIP through polymorphism.

*Choices* can also set conditions for it to be available. In the implementation, *Enums* were used to determine the availability of the *Choice*. For example, if the player does not have *Status.BLESSED*, the choice cannot be selected and will not be displayed in the parent *Dialogue*. This extension adheres to OCP as there were only extensions made for the addition of conditional availability.

## DialogueEffect

*DialogueEffect* is an interface that is implemented by all the effects (ISP) that can happen from the *Choices* in *Dialogues* like *GiveHeal*, *GiveItem*, *InflictDamage*, *ToggleChoice* and more (SRP). This approach allows a diverse amount of effects to be easily created, plugged into *Choices*, and have its *trigger()* method called dynamically (DIP, SRP, LSP). New effects can also be created and added to the existing codebase without needing modifications to existing classes (OCP).

While *DialogueEffects* could be implemented into *Dialogues* instead, implementing them in *Choices* was preferred because it allows more flexibility over causing effects. This is because different choices can lead to the same *Dialogue*, and it may not be desirable to trigger an effect.

## DialogueAction

*DialogueAction* extends the abstract *Action* class to enforce common methods, allowing for polymorphism through abstractions (DIP).

*DialogueAction* will have an association with *Dialogue* classes. This allows *DialogueAction* to pass the *Dialogue* into *DialogueSystem* (DIP) for execution, adhering to SRP.

## dialogueLibrary (package)

This package contains all of the NPCs' dialogues. All of the *Dialogue* classes in this package should represent the starting node of the branching dialogue system, thus it initialises (builds) all of its linked *Dialogues*, *Choices* and *DialogueEffects*.

Every NPC has its unique *Dialogue* (SRP), and each *Dialogue* class in this package extends from the *Dialogue* class (DRY, LSP), adhering to DIP by enabling polymorphism.

### KaleDialogue

A dialogue subclass for *MerchantKale*. This dialogue was created to demonstrate a basic cyclic dialogue graph.

### EniaDialogue

A dialogue subclass for *FingerReaderEnia*. This dialogue was created to demonstrate a cyclic dialogue graph, with choice toggling and rune giving.

## GostocDialogue

A dialogue subclass for *GateKeeperGostoc*. This dialogue was created to demonstrate a cyclic dialogue graph, with choice toggling and item giving.

## HuTaoDialogue

A dialogue subclass for *HuTao*. This dialogue was created to demonstrate a dialogue tree, with choice toggling and healing.

## ShutenDoujiDialogue

A dialogue subclass for *ShutenDouji*. This dialogue was created to demonstrate a cyclic dialogue graph with choice toggling, weapon giving, damage infliction and conditional choices.

## HuTao

A friendly descendent that extends *Actor* (DRY). Created to demonstrate healing effects via its *Dialogue*.

## GateKeeperGostoc

A friendly but suspicious man that extends *Actor* (DRY). Created to demonstrate item giving effect via its *Dialogue*.

## ShutenDouji

A demonic enemy that extends *Enemy* (DRY). Does not attack friendlies, created to demonstrate damage infliction, weapon giving, conditional choices via its *Dialogue*.

## Chisui

*Chisui* is a unique weapon given by *ShutenDouji* through his *Dialogue*. It provides the capability Status.BLESSED, and has the special ability Bloodsuck.

*Chisui* extends the abstract *WeaponItem* class. It shares common attributes with *WeaponItem*, so it is logical to abstract this class (DIP) to reduce code redundancy (DRY).

## Bloodsuck

*Bloodsuck* is a weapon skill that damages the target with 50-100% of the original weapon's damage, and heals the user for the amount of damage dealt.

*Bloodsuck* is a concrete class that extends from *Action* to utilise polymorphism through abstractions. It depends on *AttackAction* to reduce code redundancy (DRY) and promote maintainability when changes are needed. While it can be made to extend *AttackAction*, dependency was considered over inheritance to avoid over abstraction.


Although avoiding over-abstraction can promote maintainability, it is important to strike a balance between abstraction and maintainability; In probable future circumstances, *Bloodsuck* could be made to inherit *AttackAction* to ensure optimal flexibility and extensibility.

*WeaponModifier* is used as a damage substitute to adhere to OCP.

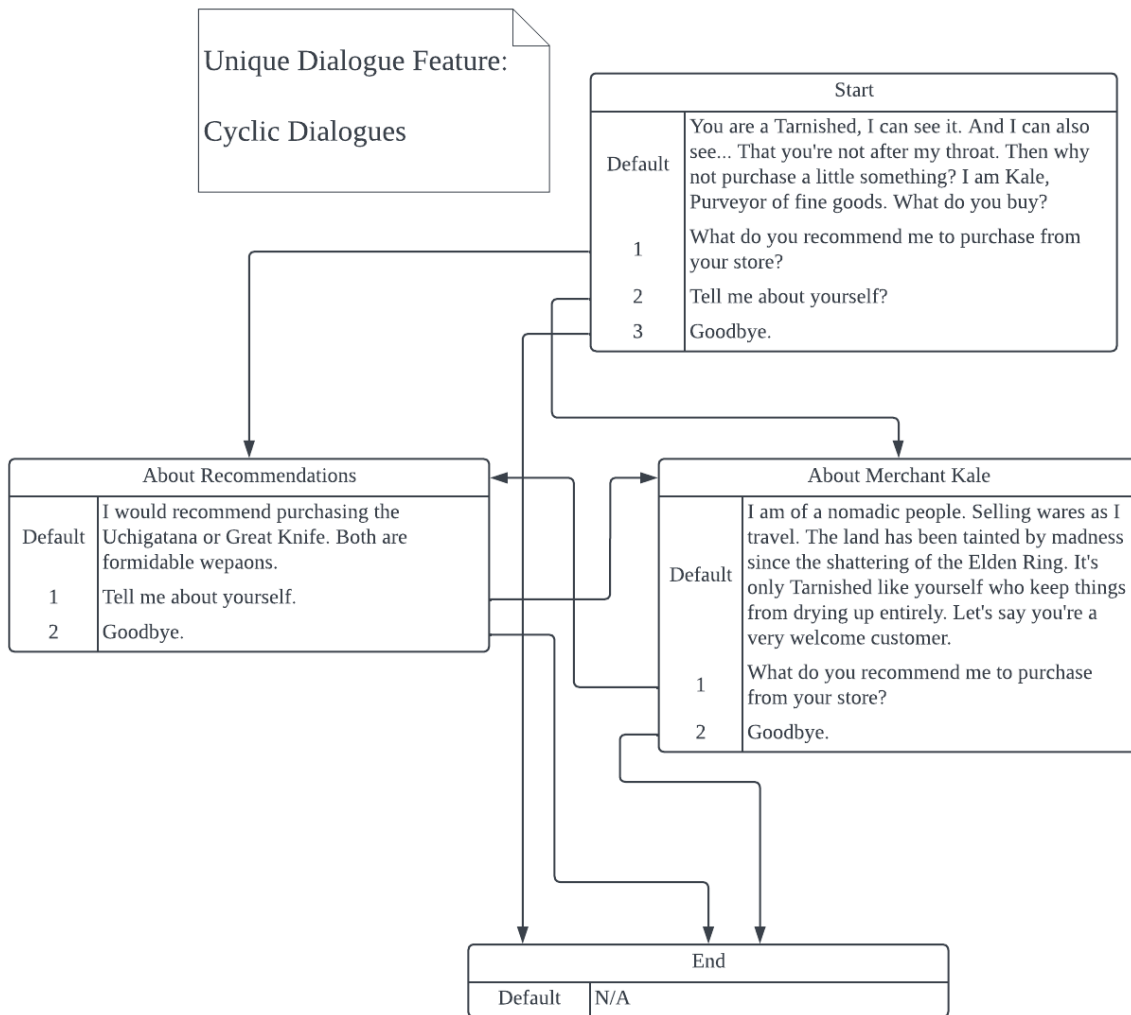
## **Note**

Dialogue branching graphs were illustrated throughout the design process to provide a visual representation of the Dialogue flow to the developers (us) and readers.

# Contribution Log Link

 FIT2099 MY (THU 10 AM) Assignments' Contribution Logs

# Kale





Unique Dialogue Feature:

Cyclic Dialogues

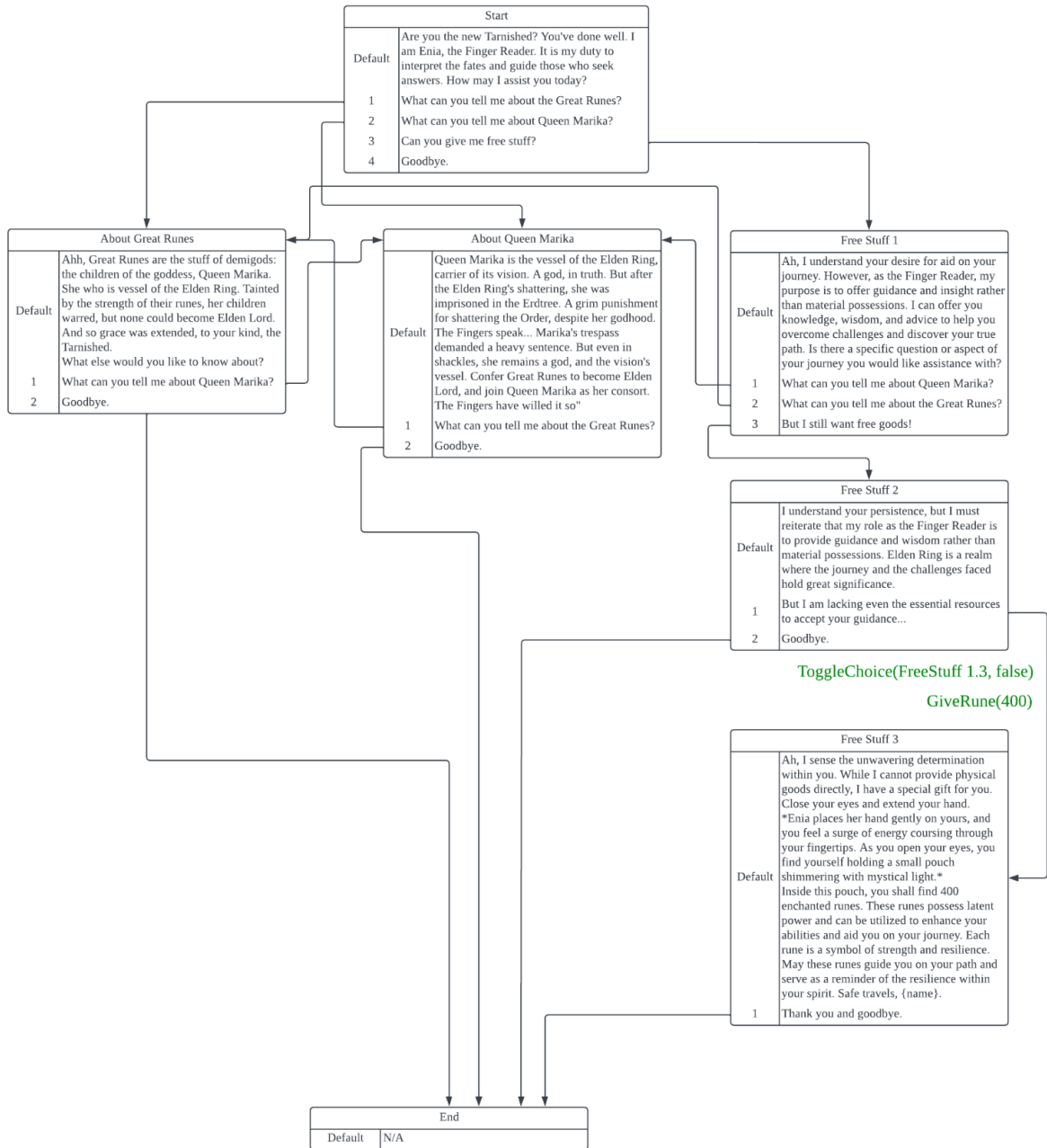
ToggleChoice()

Toggles the availability of a Choice.

GiveRune()

Can give player any amount of runes. (400)

## Enia



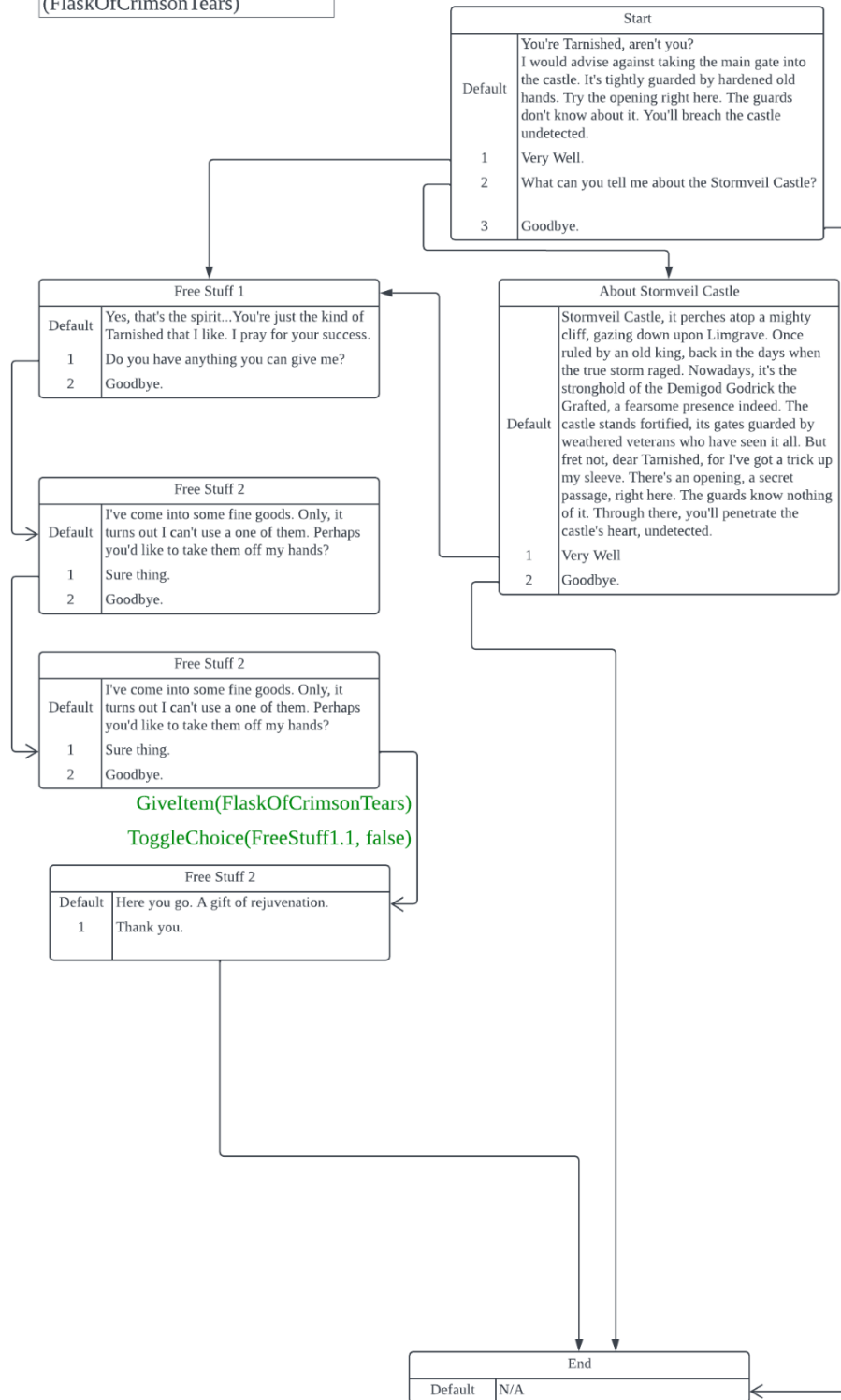
Unique Dialogue Feature:

Cyclic Dialogues

ToggleChoice()  
Toggles the availability of a  
Choice.

GiveItem()  
Can give the player any item  
(FlaskOfCrimsonTears)

# Gatekeeper Gostoc

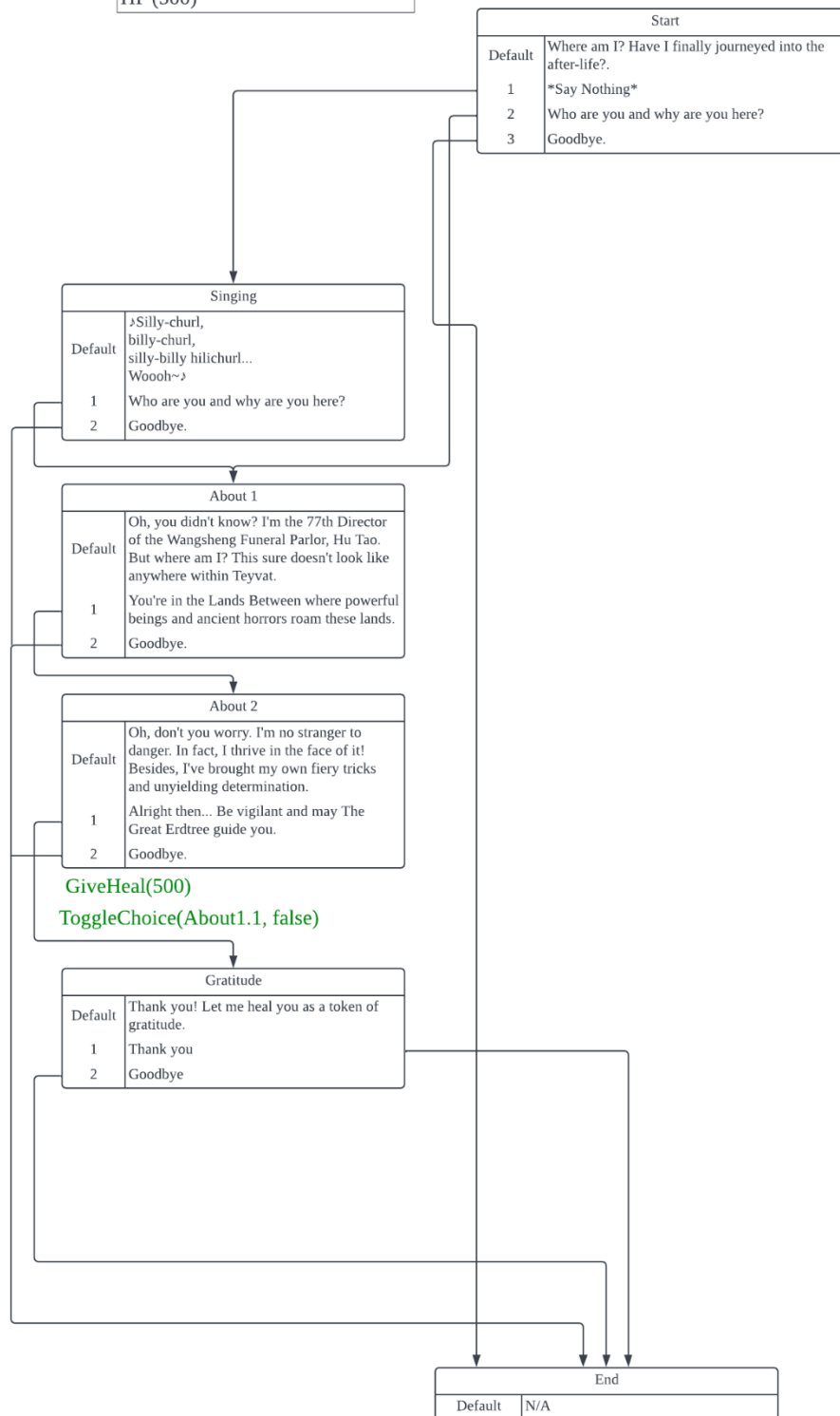


Unique Dialogue Feature:

**ToggleChoice()**  
Toggles the availability of a Choice.

**GiveHeal()**  
Heals the player any amount of HP (500)

## Hu Tao



Shuten  
Douji

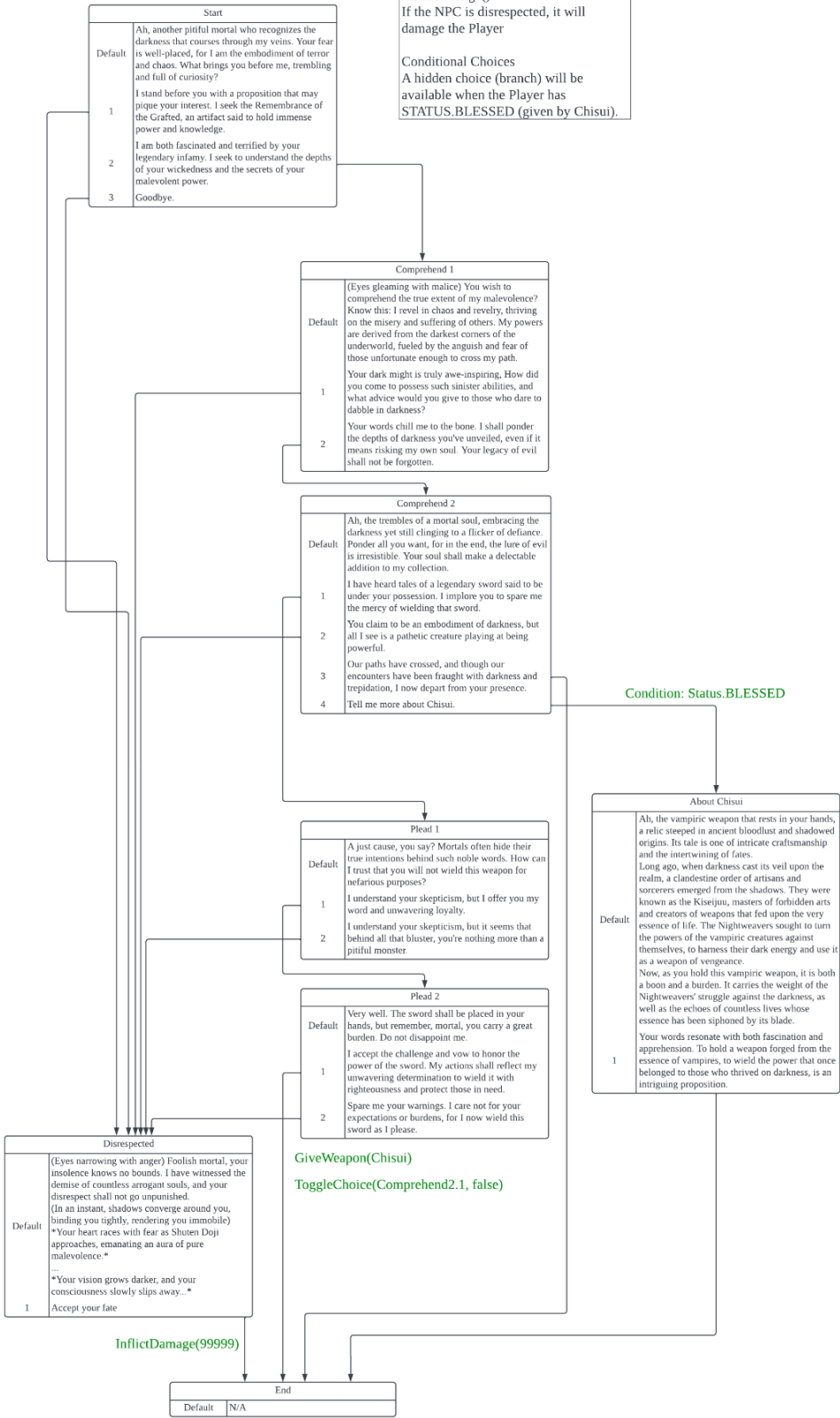
Unique Dialogue Feature:

GiveWeapon()  
Can give the player any weapon  
(Chisui).

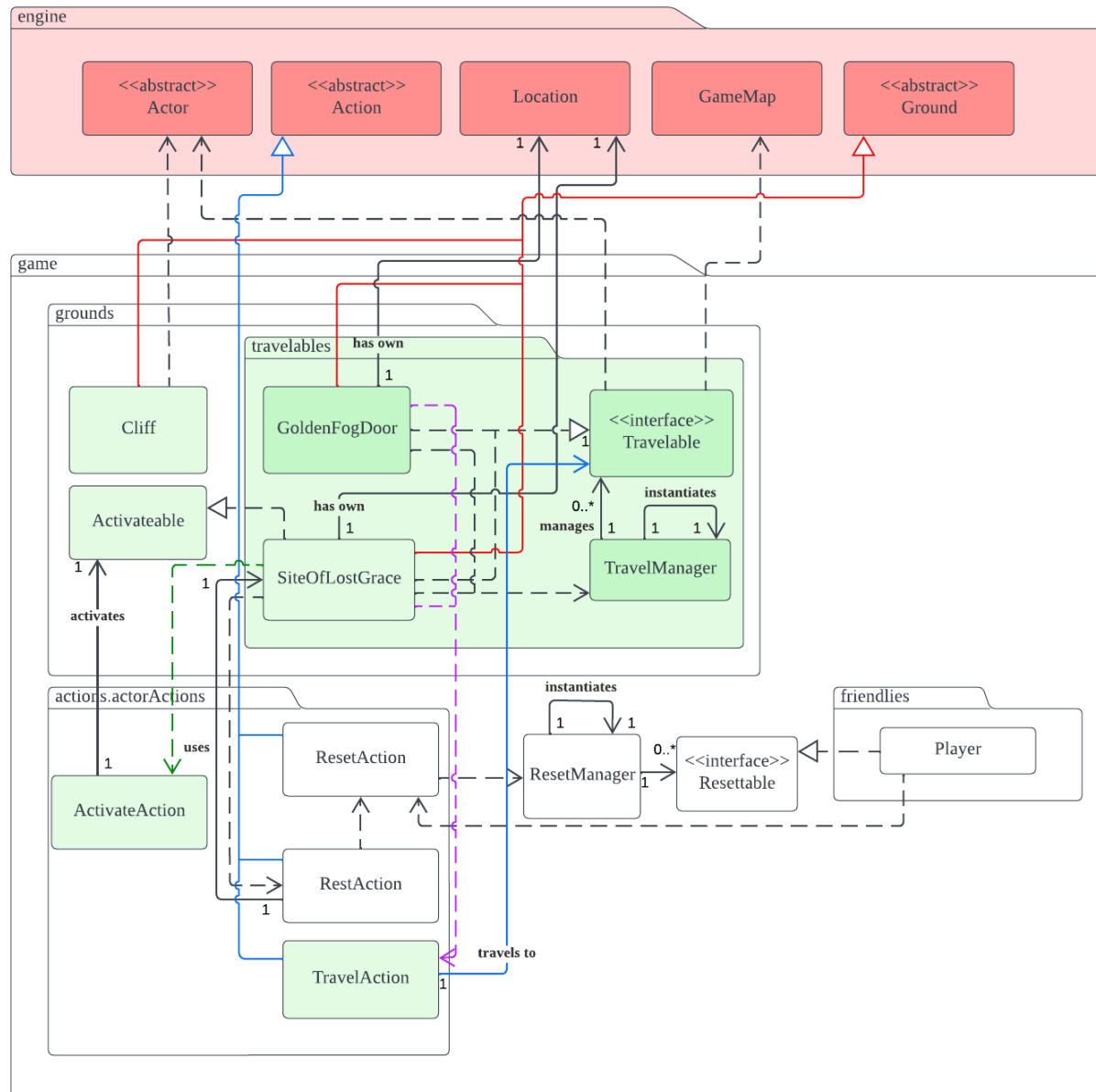
ToggleChoice()  
Toggles the availability of a Choice.

InflictDamage()  
If the NPC is disrespected, it will  
damage the Player

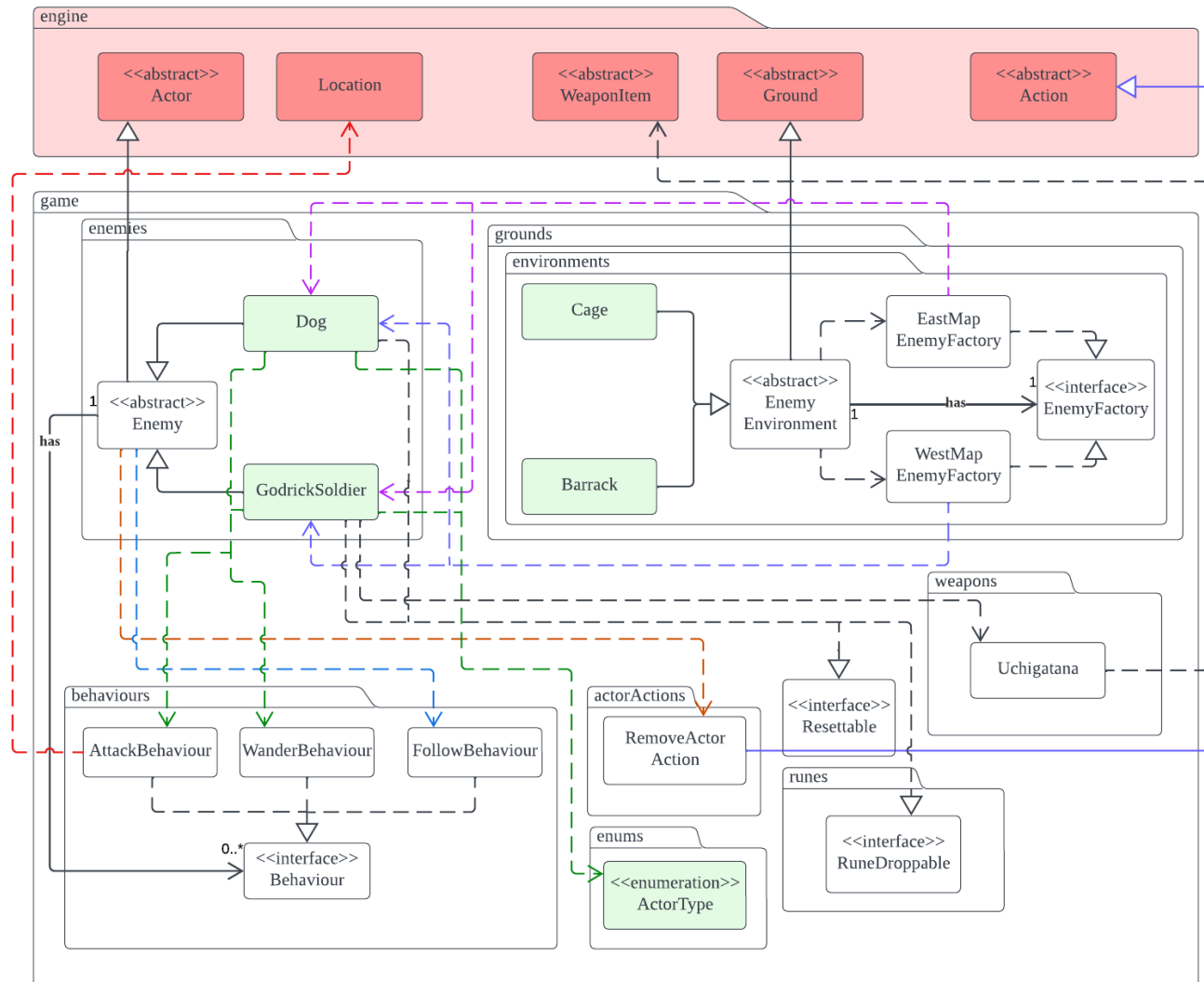
Conditional Choices  
A hidden choice (branch) will be  
available when the Player has  
STATUS.BLESSED (given by Chisui).



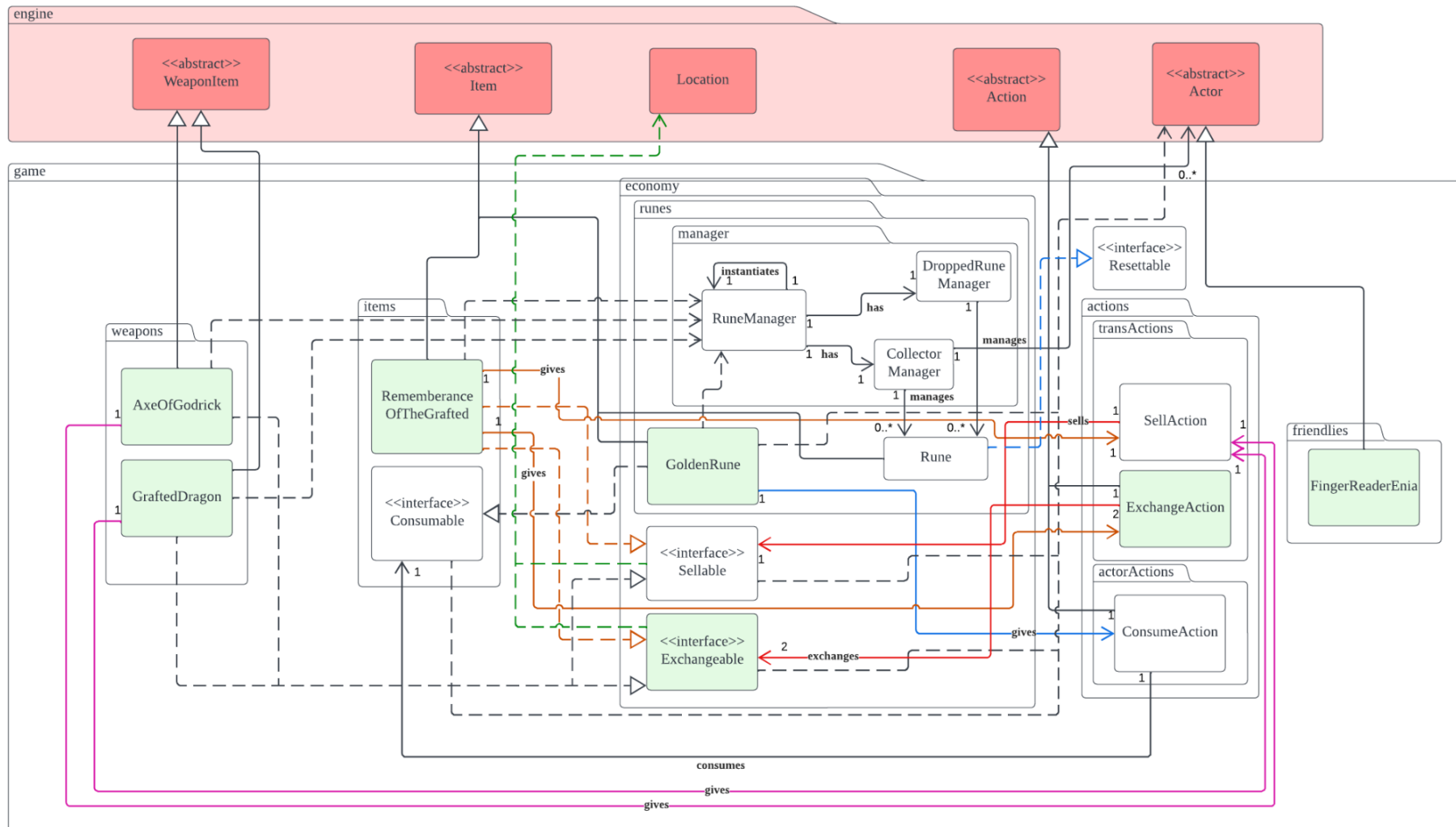
## REQ1: Travelling between Maps



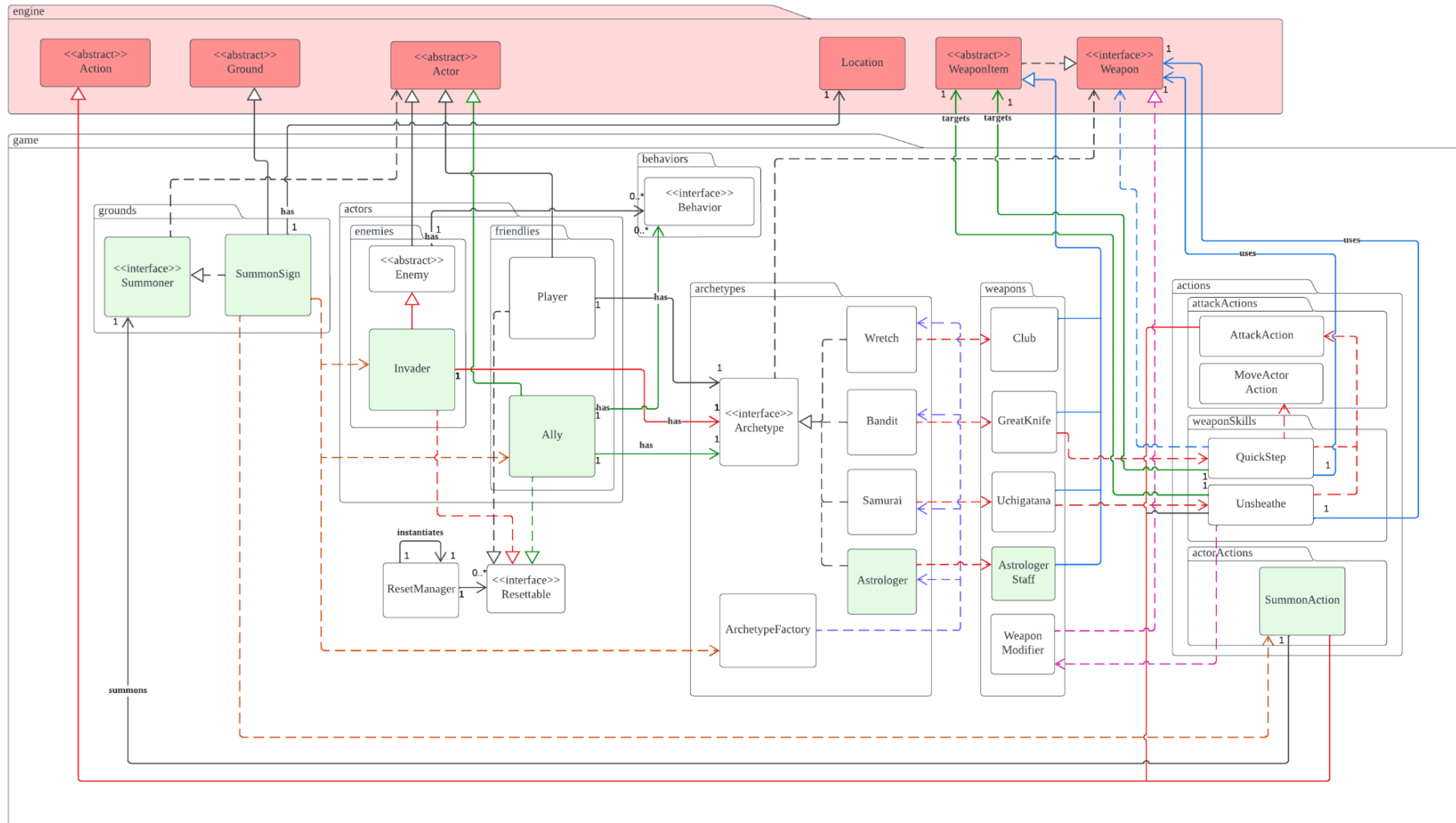
## REQ2: Inhabitant of the Stormveil Castle



## REQ3: Godrick the Grafted



## REQ4: A Guest from Another Realm





### REQ5: Creative Requirement (Dialogue with NPCs)

