

Assignment 2 REQ3: Enemies

Overview:

Due to the design changes for achieving Assignment 3 features, there will be some classes created or modified in Assignment 2's design. (i.e., GeneralKoopas and FlyingKoopas created in the extended system, Koopa and Status will be modified due to the new design.) Besides, GeneralKoopas and FlyingKoopas is part of Assignment 3 REQ2, so detailed explanation will be state in Assignment 3 design rationale. The design rationale for each new or modified class is shown on the following pages.

1) GeneralKoopas

Why I choose to do it that way:

In Assignment 3, I created a new abstract class called GeneralKoopas to be the parent class of all Koopas(normal Koopa and Flying Koopa) in this game, and GeneralKoopas extends Enemy to obtain all the enemy features. By adding an abstract GeneralKoopas class, all the common behaviors of Koopas can be state in this class and its child class can inherit from it directly and save in a hashmap called behaviors. This is to avoid too many repeated code, this obeys the DRY design principle, which make our code a good maintenance.

Besides that, if more Koopas need to be implemented in this game, we don't have to repeat so many codes. This follows the open close principle because when more Koopas added, you do not have to modified GeneralKoopas class but allow additional class to extends it, hence it allow extension.

2) FlyingKoopas

What changed in the design rationale between Assignment 2 and Assignment 3 and Why:

In Assignment 3, I created a new class called FlyingKoopas because it is a requirement stated in Assignment 3 REQ2, so the detailed explanation will be written in Assignment 3 design rationale.

3) Enemy

What changed in the design rationale between Assignment 2 and Assignment 3 and Why:

There is no changes in this class of REQ3 between Assignment 2 and Assignment 3.

4) Goomba

What changed in the design rationale between Assignment 2 and Assignment 3 and Why:

There is no changes in this class of REQ3 between Assignment 2 and Assignment 3.

5) Koopa

What changed in the design rationale between Assignment 2 and Assignment 3 and Why:

In Assignment 3, instead of let Koopa class extend Enemy class, I make Koopa class extends GeneralKoopa class. In Assignment 2, there was only one type of Koopa so extends Enemy class is enough. But at this stage, two types of Koopas is exist, so if these two types of Koopas still extends Enemy class, there will be too many repeated code appear, which disobey the design principle DRY(don't repeat yourself).

Why I choose to do it that way:

By doing so, many default behaviors of Koopa can be override form its parent class(GeneralKoopa) directly without coding again. This obeys the design principle DRY and make the code more logic and easy to read. Besides that, Koopa class has its own responsibility which it performs the behavior of Koopa only, so it obeys SRP(single responsibility principle). It also adheres to the Liskov Substitution Principle, which ensures that the meaning of parental acts is preserved.

6) Status Enum

What changed in the design rationale between Assignment 2 and Assignment 3 and Why:

For this enumeration class, I create a new capability for FlyingKoopa which is CAN_FLY. Since it is part of Assignment 3 REQ2 requirement, I will explain this in details in Assignment 3 design rationale.

7) Floor

What changed in the design rationale between Assignment 2 and Assignment 3 and Why:

There is no changes in this class of REQ3 between Assignment 2 and Assignment 3.

8) AttackAction

What changed in the design rationale between Assignment 2 and Assignment 3 and Why:

There is no changes in this class of REQ3 between Assignment 2 and Assignment 3.

9) AttackBehavior

What changed in the design rationale between Assignment 2 and Assignment 3 and Why:

There is no changes in this class of REQ3 between Assignment 2 and Assignment 3.

10) AttackShellAction

What changed in the design rationale between Assignment 2 and Assignment 3 and Why:

There is no changes in this class of REQ3 between Assignment 2 and Assignment 3.