The Final Restoration

Python Game Design

Time: 60 mins

Introduction

In this class, the student/s will create a monster zombie. Student/s will also learn to move and restore the monster zombie to human form and display an animation after Dr. Cleo reaches the lab.

Recall Commands

- class childClass(parentClass)   This defines the child class of the parent class using inheritance.

- self   self represents the instance of the class. By using self, we can access the properties and methods of the current object.

- ==   Compares the two operands for equality and returns a boolean result.

- isTouching(object1, object2)   User-defined function that checks if object1 and object2 collide with each other.

Vocabulary

- **Polymorphism** allows modifying method/s in the child class that is/are inherited and has/have the same name as the method/s in the parent class.
- **Method Overriding** uses the same method from the parent class and adds the functionality as needed in the child class.

Learning Objectives

Student/s should be able to:
- ***Recall*** how to create a child class from a parent class using inheritance.
- ***Demonstrate*** how to override the parent class methods in the child class.
- ***Illustrate*** how to add and update game states and display an image.
- ***Create*** and display a monster zombie moving vertically and help Dr. Cleo to collect the lab key after restoring the monster zombie to the guard of the lab. and stop the gas leakage.

Activities

1. **Class Narrative:** *(2 mins)*
   - Brief the student/s that heavy exposure to the gas has turned the guard of the lab into a monster zombie and the monster zombie is blocking Dr. Cleo's path to the lab.

2. **Concept Introduction Activity:** *(5 mins)*
    - Let the student/s play the explore-activity and observe how Dr. Cleo reaches the lab.
    - Brief the student/s that Dr. Cleo can reach the lab by restoring the guard and collecting the key to the lab.
    - Using the slides, explain how:
        - to create a monster zombie
        - to move and destroy the monster zombie
        - to display the animation and image when game gets over

3. **Activity 1: Create the Monster Zombie :** *(7 mins)*

    Student Activity: *(7 mins)*
    - Guide the student/s to create the MonsterZombie() class as a child class with Zombie() as it's parent class and display it.
    Note: The object type for the monster zombie is 9.

4. **Activity 2: Move and Restore the Monster Zombie :** *(15 mins)*

    Teacher Activity: *(5 mins)*
    - Highlight to the student/s that the heavily exposed monster zombie needs 3 serum bubbles to restore to human form.
    - Explain to the student/s to define a method reduceEffect() to reduce the gas effect and size of a monster zombie when hit by a serum bubble. Also, explain to the student/s to call the method when the objectType is 9.

    Student Activity: *(10 mins)*
    - Guide the student/s that the move() method in the MonsterZombie() class overrides the move() method in the Zombie() class to make it move vertically instead of horizontally.
    - Explain using slides about polymorphism and method overriding.
    - Ask students to try changing the values for self.distance and self.velY.
    - Highlight to the student/s that the monster zombie moves out of the screen when hit by 3 serum bubbles.
    - Guide the student/s to modify the move() method to make the monster zombie stand on the platform. Also restore the monster zombie to human form and display the key when the monster zombie stands on the platform.
    Probing question: Can we use the same method name in the child class as in the parent class when it is overridden?
    Expected answer: Yes.

5. **Activity 3: Display the End Screen Animation :** *(10 mins)*

    Student Activity: *(10 mins)*
    - Guide the student/s to add and change the game state to 'win' when Dr. Cleo collides with the key, and display the animation and image when game ends.

6. **Introduce the Post class project:** *(2 min)*
    - In the Tank Wreck game, destroy the enemy tanks by shooting fireballs toward them.

7. **Test and Summarize the class learnings:** *(5 mins)*
    - Check for understanding through quizzes and summarize learning after respective missions.

- Summarize the overall class learning towards the end of the class.

8. **Additional activities:**
    - Encourage the student/s to make the monster zombie move diagonally instead of vertically.
    - Encourage the student/s to stop the monster zombie on the platform when restored to human.

9. **State the Next Class Objective:** *(1 min)*
    - We will learn to develop web applications.

U.S. Standards:

CSTA: 2-AP-11, 2-AP-12, 2-AP-14

Links Table		
Activity	**Activity Name**	**Link**
Class Presentation	The Monster Zombie	https://s3-whjr-curriculum-uploads.whjr.online/3b9b07b9-e670-46b1-9d31-0331b9e1ed1d.html
Explore Activity	The Monster Zombie : Explore Activity	https://tynker.me/code/view/63367331a0862204c8237a82/
Student Activity 1	Create a Monster Zombie	https://tynker.com/code/project/63367f8f949ea07f806982a2
Teacher Reference: Student Activity 1 Solution	Create a Monster Zombie : Solution	https://tynker.com/code/project/63367f72eca122013f7c8dc2
Student Activity 2.1	Move the Monster Zombie Vertically	https://tynker.com/code/project/63367f3069e0ce122c057e22
Teacher Reference: Student Activity 2.1 Solution	Move the Monster Zombie Vertically: Solution	https://tynker.com/code/project/63367e889fe52b4e3415ea82
Teacher Activity 2	Reduce size of the monster zombie	https://tynker.me/code/project/637249adcf420a3b06062d22
Teacher Reference: Teacher Activity 2 Solution	Reduce size of the monster zombie: Solution	https://tynker.com/code/project/637243eef946e96139768862
Student Activity 2.2	Display the Lab Key and Restore the Guard	https://tynker.com/code/project/63367de13af99835a83e98e2
Teacher Reference: Student Activity 2.2 Solution	Display the Lab Key and Restore the Guard: Solution	https://tynker.com/code/project/63367dac31cd247d97539662
Student Activity 3	Collect the Key and Stop the Gas	https://tynker.com/code/project/63367d3c0a4bee429730a5a2

Teacher Reference: Student Activity 3 Solution	Collect the Key and Stop the Gas: Solution	https://tynker.com/code/project/63367331a0862204c8237a82
Student's Additional Activity 1	Move the Monster Zombie Diagonally	https://tynker.com/code/project/63356960f9f44517a038f0d2
Teacher Reference: Student's Additional Activity 1 Solution	Move the Monster Zombie Diagonally: Solution	https://tynker.com/code/project/6335692b119ed760ff35e3d2
Student's Additional Activity 2	Stop the Monster Zombie on the Platform	https://tynker.com/code/project/6335689e4d67e9324f3c8f52
Teacher Reference: Student's Additional Activity 2 Solution	Stop the Monster Zombie on the Platform: Solution	https://tynker.com/code/project/63355058a81c611ae67b42a2
Post Class Project	Tank Wreck - IV	https://tynker.com/code/project/634fa6eae888f855f9235f19
Teacher Reference: Post Class Project Solution	Tank Wreck - IV : Solution	https://tynker.com/code/project/634d33eba02b5005a3144f32