Zombies' Day Out

Python Game Design

Time: 60 mins

Introduction

In this class, student/s will learn to add zombies to the game and display their walking animation. Student/s will also learn to move the zombies back and forth.

Python Commands Introduced

- super().__init__()

  Call the super().__init__() method to initialize the parent class properties in the child class. It also allows the addition of child-specific information to the child object as well.

- if statement:
  #commands
  elif statement:
  #commands
  elif statement:
  #commands

  If only one condition out of a set of conditions can be true at a time, we use elif instead of if"

Vocabulary

- **Animation:** An animation of any action sequence is a collection of multiple images of different poses of the action played in quick succession.
- **super()** keyword is used to access the methods and properties of a parent class.

Learning Objectives

Student/s(s) should be able to:

- ***Recall*** how to inherit a child class from the parent class to create a new class for zombies.
- ***Describe*** how to add and change animations for Dr. Cleo using key events.
- ***Explain*** how to add and change animations for zombies and automate their back-and-forth movement.
- ***Demonstrate*** how to use super() to access the properties of the parent class from the child class.
- ***Create*** and display zombies along with the animations when they move on the platforms.

Activities

1. **Class Narrative:** *(2 mins)*
   - Brief the student/s that Dr. Cleo comes across a challenge on the newly created path.

2. **Concept Introduction Activity:** *(5 mins)*

- Let the student/s play the explore-activity and observe that Zombies have taken over the new path and are moving back and forth on the platform.
- Brief the student/s that they will add zombies and animate the game characters.
- Using the slides, explain:
    - how to add zombies on the platform
    - how to add walking animation for Dr. Cleo and zombies
    - how to move the zombies

3. **Activity 1: Add Zombies to the Platform:** *(7 mins)*

    Student Activity: *(7 mins)*
- Recall for the student/s the concept of inheritance to create a new class to add movement to the zombies.
- Guide the student/s to create a new class Zombie() using the concept of inheritance to add movements for the zombies. Also, let the student/s experiment with placing the zombies by updating the values in the file grid.py.
  Note: The object type used for a zombie is 3.

4. **Activity 2: Add Walk Animation:** *(15 mins)*

    Student Activity: *(5 mins)*
- Highlight to the student/s that an idle animation is moved instead of a walking animation on keypress for Dr. Cleo.
- Guide the student/s to define the method changeAnimation() in the class Sprite() to animate Dr. Cleo's walk and call it in the functions keyPressed() and keyReleased().

    Teacher Activity: *(5 mins)*
- Highlight the difference between Dr. Cleo's and zombies' movements that zombies move automatically and Dr. Cleo is controlled by the player.
- Explain to the student/s the need to add more properties to store the zombie's animations to the child class using the existing properties of the parent class by calling the super() method.
- Explain to the student/s to create an initializer method for the class Zombie() to initiate two properties for animations and access the parent class properties using super(). Also, explain to the student/s to pass the additional parameter for showing the zombie's animation toward the right.
- Explain to the student/s to replace 'if' with 'elif' to check multiple conditions in an optimized way.

    Student Activity: *(5 mins)*
- Guide the student/s to create an initializer method for the class Zombie() to initiate two properties for animations and access the parent class properties using super().
- Guide the student/s to pass the correct animations for the zombies created within main.py and replace 'if' with 'elif'.
  Note: The objectType 3, 4, 5, and 6 are for different zombies.

5. **Activity 3: Move the Zombies:** *(8 mins)*

    Teacher Activity: *(5 mins)*
- Explain to the student/s that to measure the distance covered by a zombie, they will use a variable named 'distance' and increase it by 1 continuously in the move() method. Also, the direction can be changed along with the change in walk animation when the distance covered is 200/400/0.

Distance variable value	Zombie movement details
1	Zombie animation changes to the left and starts to move toward the left.
200	Zombie animation changes to the right and starts to move toward the right.
400	Zombie distance resets to 0.

Also, call the method move() within the function draw() to display the updated position of the zombie.

- Show the student/s the code already added to add movement to the zombies using properties velX, velY, and method updatePosition(). Also, the method updatePosition() is called in main.py.
- Explain to the student/s how to change the zombie's animation and direction to the right when the value of the distance becomes 200.
  Note: Make sure the student doesn't get confused between the super class and super() method.

Student Activity: *(3 mins)*

- Guide the student/s to change the zombie's direction to the right along with the animation.

6. **Introduce the Post class project:** *(2 min)*
   - While playing the Tank Wreck game, it appears that the enemy tanks are moving, but the animations seem to be incorrect. Fix the animations of the enemy tanks.

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 pause the zombie and change its animation to idle after a certain distance is covered. The below table helps understand the zombie movements at a particular distance value:

Distance variable value	Zombie movement details
1	Zombie animation changes to the left and starts to move toward the left.
200	Zombie pauses and animation changes to idle animation.
400	Zombie animation changes to the right and starts to move toward the right.
600	Zombie pauses and animation changes to idle animation.
800	Zombie distance resets to 0.

- Encourage the student/s to move the platforms back and forth to make the game more challenging.

9. **State the Next Class Objective:** *(1 min)*
    - We will learn to restore zombies to their human form using a special serum.

U.S. Standards:

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

Links Table		
Activity	**Activity Name**	**Link**
Class Presentation	Zombies' Day Out	https://s3-whjr-curriculum-uploads.whjr.online/70e1a766-5610-45d5-bf92-ea2a82a34fae.html
Explore Activity	Explore activity - Zombies' Day Out	https://tynker.com/code/view/6361f42354e6d97dd71d40b2/
Student Activity 1	Add the Zombies to the Platform	https://tynker.com/code/project/632bf572b4b79821c77908a2
Teacher Reference: Student Activity 1 Solution	Add the Zombies to the Platform - Solution	https://tynker.com/code/project/632bf51b6017e750a96e1937
Student Activity 2.1	Animate Dr. Cleo	https://tynker.com/code/project/632bf4f15e4ec364ed7140b2
Teacher Reference: Student Activity 2.1 Solution	Animate Dr. Cleo - Solution	https://tynker.com/code/project/632bf42d73f12b49c914ea02
Teacher Activity 2.2	Animate the Zombies	https://tynker.com/code/project/632bf959b672ae1ac5300902
Teacher Activity 2.2 Solution	Animate the Zombies - Solution	https://tynker.com/code/project/632bf616f11df06f8f738fe2
Student Activity 2.2	Animate the Zombies	https://tynker.com/code/project/632bf340685f31404518a302
Teacher Reference: Student Activity 2.2 Solution	Animate the Zombies - Solution	https://tynker.com/code/project/632bf0453c0a6b34a0077cc2
Teacher Activity 3	Move the Zombies	https://tynker.com/code/project/632bef79f1b6bb2a21460982
Teacher Activity 3 Solution	Move the Zombies - Solution	https://tynker.com/code/project/632bef32d15e4f2de8135ce2
Student Activity 3	Automate the Zombie's Movement	https://tynker.com/code/project/63

		2bee9f52febe48ce072282
Teacher Reference: Student Activity 3 Solution	Automate the Zombie's Movement - Solution	https://tynker.com/code/project/6335825e53277d62220a8832
Student's Additional Activity 1	Pause Zombies' Movement	https://tynker.com/code/project/6335a3a2e1248452f95f42f2
Teacher Reference: Student's Additional Activity 1 Solution	Pause Zombies' Movement - Solution	https://tynker.com/code/project/6335864a7a4c030d210f7b02
Student's Additional Activity 2	Move the Platforms	https://tynker.com/code/project/6335c21ac7fac8736418d212
Teacher Reference: Student's Additional Activity 2 Solution	Move the Platforms - Solution	https://tynker.com/code/project/6335bcceb31fb27f1c057a42
Post Class Project	Tank Wreck - I	https://tynker.com/code/project/634fd797fbc12968fd1610f2
Teacher Reference: Post Class Project Solution	Tank Wreck - I - Solution	https://tynker.com/code/project/634fb42efd1815558427d272