The Restoration Bubble

Python Game Design

Time: 60 mins

Introduction

In this class, the student/s will learn to create the serum bubbles and release them when the spacebar is pressed. Student/s will learn to use logical operators ‘and’ and ‘or’ to check for multiple conditions in the if statement and help Dr. Cleo turn the zombies back to human form.

Python Commands Introduced

- and — Used to combine multiple conditions into one. Returns True if all the conditions are True.
- or — Used to combine multiple conditions into one. Returns True if any of the conditions are True.

Vocabulary

- **Logical Operator** is a symbol or word used to connect two or more expressions. The outcome of the combined expression will depend on the outcome of the individual expressions. Common logical operators include AND, OR, and NOT.
- **Dynamic / Runtime Object Creation**: Objects are created at runtime when certain conditions are met. Example: When a key is pressed or an if condition is satisfied.

Learning Objectives

Student/s should be able to:

- ***Recall*** how to inherit a child class from a parent class.
- ***Explain*** how to use the logical operators ‘and’ and ‘or’ to check multiple conditions together.
- ***Describe*** how to check the value of boolean variables without using ‘==’.
- ***Create*** and display serum bubbles, release them when the spacebar is pressed, and help Dr. Cleo turn the zombies back to human form.

Activities

1. **Class Narrative:** *(2 mins)*
    - Brief the student/s that as the gas is turning the citizens into zombies, Dr. Cleo frantically looks for a cure that will help her save the city. On moving ahead, Dr. Cleo comes across a few serum tubes.

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

- Let the student/s play the explore-activity using the arrow and space keys and observe that Dr. Cleo discovers some serum-filled tubes and uses the serum to release serum bubbles. The zombies turn to humans coming in contact with the serum bubbles.
- Brief the student/s that they will restore the zombies to their human form.
- Using the slides, explain:
    - to create the serum bubbles
    - to release the serum bubbles
    - to restore the zombies to their human form

3. **Activity 1: Create the Serum Bubbles :** *(12 mins)*

    Teacher Activity: *(6 mins)*
- Recall how to inherit a child class from a parent class.
- Explain to the student/s to inherit class Serum() from class Sprite() to create the serum bubbles.

    Student Activity: *(6 mins)*
- Highlight that the serum bubbles should be displayed at the tip of the bubblegun on the keypress.
- Guide the student/s to write code in the keyPressed() function to create bubbles when the spacebar is pressed. Mention that creation of the serum bubble object on pressing the spacebar is called dynamic object creation.
- Highlight that the number of serum bubbles released could be more than the number of serum tubes collected.
- Guide the student/s to add the functionality to create serum bubbles only when serum tubes are available by writing an if condition to create the bubbles till the serum tubes are more than zero.

4. **Activity 2: Release the Serum Bubbles :** *(10 mins)*

    Student Activity: *(10 mins)*
- Lead the student/s to set the serum bubbles in motion by updating the property velX of serum bubbles when the spacebar is pressed.
- Guide the student/s to set the direction of the serum bubble to match the direction of Dr. Cleo using conditionals and the ‘or’ operator.
  Probing question: Which logical operator returns true if any of the conditions are true?
  Expected answer: ‘or’ operator

5. **Activity 3: Restore to Human Form :** *(10 mins)*

    Student Activity: *(10 mins)*
- Explain to the student/s using slides how to define a method recover() to turn zombies to human form.
- Guide the student/s to define a variable isInfected to indicate whether a zombie is infected or not in the class Zombie(). Define the method recover() in which the zombie animation is changed to human animation. Call the same when a serum bubble hits the zombie and if the zombie is infected. Explain the use of the ‘and’ operator. Also, guide the students to add the transition animations.

- Guide the students to check the objectType of a zombie and pass the corresponding parameters before calling the recover() method.

6. **Introduce the Post class project:** *(2 min)*
- In the Tank Wreck game, create and shoot fireballs at 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 remove the treasure chests when shot to collect the serum tubes.
    - Encourage the student/s to recover birds from the flying zombies.

9. **State the Next Class Objective:** *(1 min)*
    - We will learn to use game states and add images to continue and restart the game.

U.S. Standards:

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

Links Table		
Activity	**Activity Name**	**Link**
Class Presentation	The Restoration Bubble	https://s3-whjr-curriculum-uploads.whjr.online/efb6f997-ec35-43f9-afbf-078bd9943425.html
Explore Activity	The Restoration Bubble - Explore Activity	https://tynker.me/code/view/63624482441a1c2a567dd3a2/
Teacher Activity 1	Create the Serum Bubbles	https://tynker.com/code/project/632be5828f0050197e1691a2
Teacher Activity 1 Solution	Create the Serum Bubbles - Solution	https://tynker.com/code/project/632be473ac9d070d26031742
Student Activity 1.1	Display the Serum Bubbles on Keypress	https://tynker.com/code/project/632be4137d5d8541696f7ff2
Teacher Reference: Student Activity 1.1 Solution	Display the Serum Bubbles on Keypress - Solution	https://tynker.com/code/project/6333e0efee5bd20e424e1e72
Student Activity 1.2	Limit the Creation of the Serum Bubbles	https://tynker.com/code/project/6333e0b0b3f43f18cb0f38a2
Teacher Reference: Student Activity 1.2 Solution	Limit the Creation of the Serum Bubbles - Solution	https://tynker.com/code/project/632be2756fd217312c677eb2
Student Activity 2	Release the Serum Bubbles	https://tynker.com/code/project/632be22a43b4bc422e7ec102
Teacher Reference: Student Activity 2 Solution	Release the Serum Bubbles - Solution	https://tynker.com/code/project/632be1659cf38a601f5e0e71

Student Activity 3.1	Recover the Humans	https://tynker.com/code/project/632bdffca4e61e53830ebca2
Teacher Reference: Student Activity 3.1 Solution	Recover the Humans- Solution	https://tynker.com/code/project/632bdbe13ddcf269ff491cf2
Student Activity 3.2	Restore the original Human Form	https://tynker.com/code/project/636243341d0b224e550b2ce2
Teacher Reference: Student Activity 3.2 Solution	Restore the original Human Form- Solution	https://tynker.com/code/project/63624482441a1c2a567dd3a2
Student's Additional Activity 1	The Treasure Chest	https://tynker.com/code/project/635b4b00bc144c440b470802
Teacher Reference: Student's Additional Activity 1 Solution	The Treasure Chest - Solution	https://tynker.com/code/project/635b4a36028f96268609d052
Student's Additional Activity 2	Flying Zombies	https://tynker.com/code/project/635b4a36028f96268609d052
Teacher Reference: Student's Additional Activity 2 Solution	Flying Zombies - Solution	https://tynker.com/code/project/635b48f8b0a25037912eec02
Post Class Project	Tank Wreck - II	https://tynker.com/code/project/634fddf4e6439f24a76fc2f2
Teacher Reference: Post Class Project Solution	Tank Wreck - II - Solution	https://tynker.com/code/project/634fb311d23e97041c0b09c2