The Secret Cavern

Python Game Design

Time: 60 mins

Introduction

In this class, student/s will learn how to load animation using loadAnimation() and use helper function to display animation for the game character. Student/s will also learn to change the animation when a key is pressed and released to help Zonan knock out the monster.

Python Commands Introduced

- **loadAnimation**(list_of_images):   Loads animation from a list of images passed as parameter.

Vocabulary

- **Animation**: An animation of any action sequence is a collection of multiple images of different poses of the action played in quick succession.
- **Helper functions**: Helper functions are used to make your programs easier to read and reuse by performing part of the tasks in another function following the DRY (Don't repeat yourself) philosophy.

Learning Objectives

Student/s should be able to:
- ***Identify*** the difference between an image and an animation.
- ***Demonstrate*** how to load and display animations.
- ***Recall*** keypress and key release.
- ***Create*** a game to help Zonan fight the monster using animations and pass through a secret cave.

Activities

1. **Class Narrative:** *(2 mins)*

● Brief student/s that Zonan has entered a secret cave that is inhabited by a monster. Zonan has to knock out the monster and escape from the cave through a portal.

2. **Concept Introduction Activity:** *(2 mins)*
   ● Let the student/s play the explore activity and observe Zonan's movement to knock out the monster in the cave using arrow keys.
   ● Guide the students to use the left and right arrow keys to move and down arrow key to knock out the Monster.
   ● Let them observe the change in animation that happens when Zonan is active and when Zonan is idle.
   ● Brief the student/s that we will learn to display Zonan using image() in activity 1. In activity 2, the student/s will learn to animate different movements for Zonan when an arrow key is pressed. In activity 3, the student/s will learn to knock out the monster using the punching animation.

3. **Activity 1: Add and display Zonan:** *(10 mins)*

   Teacher Activity:
   ● The teacher shows how to replace the image() function with the display() function.
   ● The display function accepts 3 parameters, the first parameter is the dictionary of the character or object to be displayed. The dictionary should contain at least the following properties, x-position (x), y-position (y), width (w), and height (h). The second parameter is the list of images used for animation and the third parameter is the speed of animation.
   ● Open and show the different helper functions in the file helper.py and explain what helper functions are.
   ● Compare the number of parameters of the display() function and image() function. Explain that by writing helper functions, modularity and code reuse are achieved.
   ● Revisit the concept of import statements.

   Student Activity:
   ● Guide the student/s to add the image of Zonan in the game using the display() function.

4. **Activity 2: Animate Zonan:** *(15 mins)*

   Teacher Activity:
   ● Teacher shows the student/s the different image files that will be used to simulate the animation of Zonan walking to the left.
   ● Demonstrate the process of using a list of image files to load an animation and use it to display Zonan walking to the left when the left key is pressed.

- Explain to the student/s how to load and display animation for making Zonan walk to the left when the left key is pressed.

   Student Activity 2.1:
- Guide the student/s to create a list of image files to simulate the animation of Zonan walking to the right.
- Guide them to use loadAnimation() to load it into a variable and assign it to Zonan when the right arrow key is pressed.
- Probing Question: Which function is called when a key is pressed?
   Expected Answer: keyPressed()

   Student Activity 2.2:
- Guide the student/s to set the idle animation for Zonan when the key is released in the keyReleased() function.

5. **Activity 3: Knock out the monster:** *(10 mins)*

   Student Activity:
- Guide the student/s to create a list for Zonan's knock animation and set it as the animation of Zonan when the down arrow key is pressed.

6. **Introduce the Post class project:** *(2 min)*
   - In the game, add animation to the player's movement to the right side.

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 load a defend animation and assign it to Zonan when the up arrow key is pressed.
   - Encourage the student/s to load a kicking animation and assign it to Zonan when the space bar is pressed.

9. **State the Next Class Objective:** *(1 min)*
   - We will learn to help Zonan jump over the clouds to cross a valley.

U.S. Standards:

CSTA: 2-AP-11, 2-AP-12, 2-AP-14, 2-AP-16

Links Table		
Activity	**Activity Name**	**Link**

Class Presentation	The Secret Cavern	https://s3-whjr-curriculum-uploads.whjr.online/76be3f83-b283-489d-9d39-de5d6e64025b.html
Explore Activity	Explore Activity: The Secret Cavern	https://tynker.com/code/view/62fb94fb92b5ff424a2fa5f5/
Teacher Activity 1	Add and Display Zonan	https://tynker.com/code/project/630896cd895a2d7a633d21c2
Teacher Activity 1 Solution	Add and Display Zonan - Solution	https://tynker.com/code/project/6308d4f8d7439f35ff65b174
Student Activity 1	Display Zonan	https://tynker.com/code/project/62fb9275520ceb524d0eaec5
Teacher Reference: Student Activity 1 Solution	Display Zonan - Solution	https://tynker.com/code/project/62fb93651cab3b12683ced92
Teacher Activity 2	Animate Zonan	https://tynker.com/code/project/62fb94aca057ec71b9579745
Teacher Reference: Teacher Activity 2 Solution	Animate Zonan - Solution	https://tynker.com/code/project/62fb94728150ac0b48192932
Student Activity 2.1	Animate Zonan's Walk	https://tynker.com/code/project/62fb94152e0b4d5c350d6502
Teacher Reference: Student Activity 2.1 Solution	Animate Zonan's Walk - Solution	https://tynker.com/code/project/63108fefbe318d74303e13f2
Student Activity 2.2	Control Zonan's Animation	https://tynker.com/code/project/62ff07024c638552416fcc92
Teacher Reference: Student Activity 2.2 Solution	Control Zonan's Animation - Solution	https://tynker.com/code/project/62fb93b4dffb9951007b2872
Student Activity 3	Knock out the Monster	https://tynker.com/code/project/62fb959a819a3c1a6965f672
Teacher Reference: Student Activity 3 Solution	Knock out the Monster - Solution	https://tynker.com/code/project/62fb94fb92b5ff424a2fa5f5
Student Additional Activity 1	Defend Zonan	https://tynker.com/code/project/62ff224cb7aee24c546c5f02
Teacher Reference: Student Additional Activity 1 Solution	Defend Zonan - Solution	https://tynker.com/code/project/6308dbde9005bf2c72592808
Student Additional Activity 2	Kick the Monster	https://tynker.com/code/project/62ff19656aeac5220e339815

Teacher Reference: Student Additional Activity 2 Solution	Kick the Monster - Solution	https://tynker.com/code/project/6308de2ac2f0b83d0c6694b3
Post Class Project	Animate the Player	https://tynker.com/code/project/62f20d0858b4a30a4c132712
Teacher Reference: Post Class Project Solution	Animate the Player - Solution	https://tynker.com/code/project/62f209a587f6893135517272