The Enchanted Bridge

Python Game Design

Time: 60 mins

Introduction

In this class, the student/s will learn to implement the key controls using processing.py to help Zonan move across the enchanted bridge on keypress and stop Zonan when the key is released.

Python Commands Introduced

- keyboard.keyCode — Returns the unique code of the key pressed or released.
- def keyPressed():
#commands — Executes the commands written inside it when a key is pressed.
- def keyReleased():
#commands — Executes the commands written inside it when a key is released.

Vocabulary

- **Key Pressed:** The keyPressed() function is called when a key is pressed.
- **Key Released:** Every time when a key is released, the keyReleased() function is called.

Learning Objectives

Student(s) should be able to:

- ***Recall*** how to use a dictionary.
- ***Describe*** how to perform arithmetic operations and update the dictionary values.
- ***Program*** Zonan's movement using keyPressed() and keyReleased() functions to move Zonan on key press and pause its movement when the key is released.

Activities

1. **Class Narrative:** *(1 min)*
    - Brief the student/s that Zonan has to cross the enchanted bridge to reach the Magical Jungle which is guarded by the spirits.

2. **Concept Introduction Activity:** *(5 mins)*
    - Let the student/s play the explore activity and observe Zonan's movement using arrow keys.
    - See how Zonan crosses the bridge.
    - Brief the student/s that we will learn to move Zonan in activity 1. In activity 2, the student/s will learn to move Zonan when an arrow key is pressed. In activity 3, the student/s will learn to cease Zonan's continuous movement when the arrow key is released.

3. **Activity 1: Move Zonan:** *(12 mins)*

Teacher Activity:

- Explain to the student/s about the grid system in processing.py, the (0,0) coordinate is at the top left corner, and how the x-position is updated as we move forward.
- Introduce and showcase the steps to move Zonan to the left and right by assigning positive and negative values to velX.

Student Activity:

- Guide the student/s to move Zonan vertically by adding a "velY" in the dictionary and calculating Zonan's new y-position in the function draw().
- Encourage the student/s to experiment with different values of "velY" to check how fast and slow Zonan moves.

4. **Activity 2: Move Zonan on Keypress:** *(10 mins)*

Teacher Activity:

- Explain that using arrow keys makes it easier and more engaging to move the player and introduce the function in processing.py to handle the keypress.
  Syntax:
  def keyPressed():
  #commands
- Demonstrate moving Zonan to the right by increasing the velocity if the key code of the key pressed is RIGHT.
  Note: Summarize that each key has a unique name known as a key code.

Student Activity:

- Guide the student/s to write code for moving Zonan when left, up, and down arrow keys are pressed using conditions.

5. **Activity 3: Cease Zonan's Movement on Key Release:** *(10 mins)*

Student Activity:

- Ask the student/s to give ideas to stop Zonan's movement.
- Guide the student/s to define a function keyReleased() and update the values of dictionary keys **velX** and **velY** to 0 when the respective arrow key is released.

6. **Introduce the Post class project:** *(1 min)*
   - Move the player using the arrow keys in the game.

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 scale Zonan's width and height on a keypress.
   - Encourage the student/s to limit Zonan's scale.
     Note: The teacher can allow the student/s to use the ALT and SHIFT keys to scale up and scale down. On Mac systems, the option key is used as the alt key.

9. **State the Next Class Objective:** *(1 min)*

- We will learn to add body movements to Zonan, which will help to defend Zonan from a cave monster.

U.S. Standards:

CSTA: 2-AP-11, 2-AP-14, 1B-AP-10

Links Table		
Activity	**Activity Name**	**Link**
Class Presentation	The Enchanted Bridge	https://s3-whjr-curriculum-uploads.whjr.online/0ce62527-89b9-4173-8cd8-4f2bfe22f041.html
Explore Activity	Explore Activity: The Enchanted Bridge	https://tynker.com/code/view/62f24d96f953604f78307792/
Teacher Activity 1	Move Zonan	https://tynker.com/code/project/62f248463bfd46327a18e432
Teacher Activity 1 Solution	Move Zonan : Solution	https://tynker.com/code/project/62f24756bbe8e102f42767e2
Student Activity 1	Move Zonan Vertically	https://tynker.com/code/project/62f24bdc4789072c16374c92
Teacher Reference: Student Activity 1 Solution	Move Zonan Vertically : Solution	https://tynker.com/code/project/62f24b729f16036ec0228522
Teacher Activity 2	Move Zonan Right on Keypress	https://tynker.com/code/project/62f24a0a77ffea506e4adb42
Teacher Reference: Teacher Activity 2 Solution	Move Zonan Right on Keypress : Solution	https://tynker.com/code/project/62f24933c54ea46e7b3f1eb2
Student Activity 2	Move Zonan on Keypress	https://tynker.com/code/project/62f24cea792c7a07876da432
Teacher Reference: Student Activity 2 Solution	Move Zonan on Keypress : Solution	https://tynker.com/code/project/62f24c5ddcfaa232566744a2
Student Activity 3	Cease Zonan's Movement on Key Release	https://tynker.com/code/project/62f24e2405ca8258bf4bf002
Teacher Reference: Student Activity 3 Solution	Cease Zonan's Movement on Key Release : Solution	https://tynker.com/code/project/62f24d96f953604f78307792
Student Additional Activity 1	Scale the Character	https://tynker.com/code/project/62f250789523ad60374b1852
Teacher Reference: Student Additional Activity 1 Solution	Scale the Character : Solution	https://tynker.com/code/project/62f24ed21bc2835b291a1892

Student Additional Activity 2	Limit Character Resizing	https://tynker.com/code/project/62f2518b2bbd656ddc48e2c2
Teacher Reference: Student Additional Activity 2 Solution	Limit Character Resizing : Solution	https://tynker.com/code/project/62f0abda289e8118bf2a6cc2
Post Class Project	Control the Player	https://tynker.com/code/project/62f208e573a0e54f5a064982
Teacher Reference: Post Class Project Solution	Control the Player : Solution	https://tynker.com/code/project/630771a684e05e2cf404c4f2