Game Title Screen

Python Foundation

Time: 60 mins

Introduction

In this class, students will be introduced to loops and the random module in Python, using which they will create multiple objects at random positions on the game screen. Students will also add text with different font styles. By the end of this class, students will build a game title screen using the concepts learned in the class.

Python Commands Introduced

● random.randint(lower_limit, upper_limit)	Generates a random number between the specified lower and upper limits.
● turtle.color('color')	Specifies the color to be used by the turtle.
● turtle.write("Message", font=("font_name", font_size, "font_style"))	Writes a message with the font name, font size and font style specified.

Vocabulary

- **Random** is a module in Python which allows us to generate random values within a set limit.
- **Variables** are used to store a value that can be changed by updating the variable.
- **Loops** help in running a code multiple times without writing it repetitively.

  Syntax:

  for i in range(n): Repeats the code for the count 'n' times mentioned in range().
  #code

Learning Objectives

Student(s) should be able to:

- ***Utilize*** variables to store values and add them as parameters to functions.
- ***Implement*** loops for code optimization.
- ***Implement*** random values to add variability to the expected output.
- ***Create*** a game title screen with space objects like a moon, multiple stars, a satellite and a game title.

Activities

1. **Class Narrative:** *(2 mins)*
   - Allow students to think about what objects will complete the title screen.
   - Lead them to think of multiple stars to be created for the title screen with the game name as the title.

2. **Concept Introduction Activity:** *(2 mins)*
    - Discuss with them how multiple stars can be created at random positions and a title text can be added to the screen.

3. **Activity 1: Add stars and a satellite at random locations:** *(10 mins)*

    Teacher Activity:
    - Introduce students to the random functionality and use **random.randint(-200, 200)** to obtain random values for the star's **x** coordinate.
    - Explain the use of the **variables** to store values and relate variables to real-life scenarios.

    Student Activity:
    - Guide the student to use the random function to change the y position for the 4 stars created.
    - Guide the student to obtain and store random values for the x and y position of the satellite and call the **draw_satellite(x, y)** function to position it.

4. **Activity 2: Add multiple stars:** *(10 mins)*

    Teacher Activity:
    - Introduce students to the concept of a loop to run code a specific number of times without repeating the code.
    - Use the concept of loops and demonstrate how to draw 4 stars and avoid code repetition
    - Explain the **for** loop syntax and **range**. Use **for** loop to draw 4 stars randomly.

    Student Activity:
    - Guide the students to draw 30 stars using **for** loop.
    - Probing Question: What would happen if we change the value passed to the range() function?
      Answer: The number of times the loop runs will also change accordingly
      Note: Students might miss "**:**" or code indentation for loop. Guide the student to correct it.
      Use turtle.speed(0) to fasten the speed while drawing stars.

5. **Activity 3: Add the Game Title:** *(15 mins)*

    Teacher Activity:
    - Use **turtle.write("Text",(font="font_name", font_size,"font_style"))** to add the game name as title and assign its font.
    - Explain how to move the turtle to write text at a specified location and use **turtle.color('color')** to change the color of the turtle.

    Student Activity:
    - Guide students to change the game title name, its color, font style, and font size.

6. **Post-class project:** *(2 min)*
    - Create a Celebration screen of a game with multiple fireworks and a congratulatory message.

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

8. **Additional activities:**

- Encourage them to modify the code to draw a star using the **for** loop.
- Encourage them to modify the code to generate stars with **random** sizes.

9. **State the Next Class Objective:** *(1 min)*
    - You will learn about game mechanics by adding game objects and controlling them using key events.

U.S. Standards:

CSTA: 2-AP-11, 2-AP-12, 2-AP-13, 2-AP-14

Links Table		
Activity	**Activity Name**	**Link**
Class Presentation	Game Title Screen	https://s3-whjr-curriculum-uploads.whjr.online/6298cc68-3476-4f3d-ae8c-112ec528395c.html
Teacher Activity 1	Draw Stars at Random Location	https://tynker.com/code/project/62aa27bddad307219115b1b3
Teacher Activity 1 Solution	Solution of TA1	https://tynker.com/code/project/62aa27bb8f3ca448231c7582
Student Activity 1.1	Draw Stars at Random Location	https://tynker.com/code/project/62aa277daee4200bb433bdd2
Teacher Reference: Student Activity 1.1 Solution	Solution of SA1.1	https://tynker.com/code/project/62aa06167e126375450aa8b2
Student Activity 1.2	Draw Satellite at Random Location	https://tynker.com/code/project/62b301779f26a337e7690f0b
Teacher Reference: Student Activity 1.2 Solution	Solution of SA1.2	https://tynker.com/code/project/62b2f6559df98b641141e4a2
Teacher Activity 2	Draw Multiple Stars	https://tynker.com/code/project/62aa2db0a715cb530a639892
Teacher Reference: Teacher Activity 2 Solution	Solution of TA2	https://tynker.com/code/project/62aa2db25e447c1536743902
Student Activity 2	Draw Multiple Stars	https://tynker.com/code/project/62aa2d2d65a03111096a0532
Teacher Reference: Student Activity 2 Solution	Solution of SA2	https://tynker.com/code/project/62aa19160c382f3801230162
Teacher Activity 3	Write Title	https://tynker.com/code/project/62a

		a30cfa7f60e19424697d2
Teacher Reference: Teacher Activity 3 Solution	Solution of TA3	https://tynker.com/code/project/62aa30ccd7d7d5139c76cf94
Student Activity 3	Write Title	https://tynker.com/code/project/62aa30cad7d7d5139c76cf92
Teacher Reference: Student Activity 3 Solution	Solution of SA3	https://tynker.com/code/project/62aa1aa6267b2f7dfe6d9d42
Student Additional Activity 1	Draw Star using for loop	https://tynker.com/code/project/62a03a49adc9101a6e5d4972
Teacher Reference: Student Additional Activity 1 Solution	Solution of SAA1	https://tynker.com/code/project/62a039420d3cb25bbd535432
Student Additional Activity 2	Create Multiple Stars of Random Size	https://tynker.com/code/project/62a0404c53696721442a9db2
Teacher Reference: Student Additional Activity 2 Solution	Solution of SAA2	https://tynker.com/code/project/62a03c7dc31ce568d841d8a2
Post Class Project	Fireworks	https://tynker.com/code/project/62b01cbd96f74f2db43b0c92
Teacher Reference: Post Class Project Solution	Solution of Post Class Project	https://tynker.com/code/project/62272e7fcf99b300425f3712