

## Java Fundamentals

### 2-5: Declare Procedures

### Practice Activities

#### Lesson Objectives:

- Compare and define an animation and a scenario
- Write a storyboard
- Flowchart a storyboard
- Describe inheritance and how traits are passed from superclasses to subclasses
- Describe when to implement procedural abstraction
- Demonstrate how to declare a procedure
- Identify and use procedural abstraction techniques to simplify animation development

#### Vocabulary:

Identify the vocabulary word for each definition below.

	A story that gives the animation a purpose.
	Procedures that are created by the programmer.
	A list of actions to perform a task or solve a problem.
	When each subclass object receives the methods and properties of its superclass.
	Identifies the design specifications for the animation scenario. Two types are visual and textual.
	The process of looking at programming code, identifying repetitive programming statements, and extracting them into their own methods in order to make the code easier to understand and reuse.

#### Try It/Solve It:

Open the "WhiteRabbitProject" project you saved in the previous lesson. You will use this project for all of the practice activities listed below.

1. Define a scenario.
  - a. Write a brief scenario for a White Rabbit turning, hopping forward three times, and a baby bunny following the White Rabbit.
2. Plan an animation with a storyboard.
  - a. Write a textual storyboard for a scenario where a White Rabbit turns, hops three times, and then a baby bunny follows him with two hops.

3. View inherited characteristics.
  - a. Using the class hierarchy drop-down menu, view the inherited characteristics for the White Rabbit.
  - b. Discover the superclass for the White Rabbit.
4. Declare a procedure.
  - a. Declare a "bipedHop" procedure for all bipeds. Have the procedure make the biped hop .25 meters in the air and .5 meters forward and return to the ground. Add the new procedure to myFirstMethod before coding.
  - b. Save the project.
5. Add a declared procedure.
  - a. Have the White Rabbit turn and take three hops using a declared procedure. If the rabbit collides with any of the scenery objects rearrange them to avoid collisions.
  - b. Save the project.
6. Access and edit a declared procedure.
  - a. Revise the bipedHop procedure so that the hop begins and ends gently and so the duration for each hop is a total of .5 seconds.
  - b. Save the project.
7. Use inherited procedures.
  - a. Add a bunny to the scene next to the white rabbit. Have the bunny follow the white rabbit with 2 hops.
  - b. Save the project.

## Optional Activities:

Complete the following optional practice activities below to continue practicing the concepts you learned in this lesson. Add background scenery to improve the look of your animation.

1. Create a flowchart for the following textual storyboard:
  - A cat sits on the ground, underneath a tree.
  - A dog barks and runs towards the cat.
  - The cat becomes frightened and runs up the tree.
  - The cat is stuck in the tree.
  - A person climbs the tree to save the cat.
2. Create visual and textual storyboards for the following scenario:
  - A helicopter flies through the sky but should not hit clouds, birds, or other aircraft in its path.
3. Browse the gallery tab “Gallery by Theme”. Set up an initial scene using the grass template and objects from the amazon theme. Be sure to include a tree and a bird (go to the Flyer class to select a bird). Program the animation as follows:
  - a. Position the bird on the ground, facing the tree, but 10 meters away from the tree.
  - b. Create an animation where the bird flies into the air and lands in the tree. Declare a procedure for the flying motion.
  - c. Save the project.
4. Set up an initial scene with the grass template, three bunnies, and a soccer ball.
  - a. Position the soccer ball to the right of the scene, and the bunnies away from the soccer ball to the left of the scene.
  - b. Have each bunny stand next to each other, facing the soccer ball.
  - c. Declare a procedure for the bunnies' hopping motion. Program the three bunnies to simultaneously move and hop forward until they reach the soccer ball.
  - d. Then, program one of the bunnies to kick the soccer ball.
  - e. Save the project.