Java Fundamentals
2-10: Variables
Practice Activities

Lesson Objectives:

- Understand variables and how they are used in programming

Vocabulary:

Identify the vocabulary word for each definition below.

	Symbols used to express a relationship between two expressions.
	To give a variable a name and to define the type of data the variable will contain.
	A place in memory where data of a specific type can be stored for later retrieval and use by your program.
	To assign a variable a value.
	Variables that store information about the object, such as color, width, height, and depth.

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. Declare a variable.
    a. View the declared "bipedHop" procedure under the Biped class.
    b. Declare a variable in the bipedHop procedure named "hopHeight".
    c. Give hopHeight a value type of DecimalNumber and initialize the variable to .25.
    d. Save the project.

2. Add a variable to a procedure.
    a. Add the variable hopHeight to the bipedHop procedure code so that the bunny and White Rabbit hop up and down .25 meters when the bipedHop procedure is called.
    b. Save the project.

3. Change an initialized value.
    a. Change the initialized value for the hopHeight variable to .5 meters.
    b. Test the animation. The bunny and White Rabbit hop .5 meters up in the air instead of .25 meters.
    c. Save the project.

4. Randomize the value of a variable.
    a. In the bipedHop procedure, change the value of hopHeight to a random number between .25 and .75 meters.
    b. Test the animation. The rabbit and bunny should hop random heights between .25 and .75 meters.
    c. Save the project.

5. View the Java Code on the side
    a. With the BipedHop procedure on screen click on the Window menu option, then preferences and Java Code to enable the Java code on the side window.
    b. Identify the code that shows the boundaries of the random values in the java code window (.25 and .75).
    c. In the Alice code change the first value from .25 to .45.
    d. Identify the code that shows this change in the java code window.
    e. Change the value back to .25.
    f. Close the Java window on the side window.
    g. Save the Project.

Optional Activities:

Complete the following optional practice activities below to continue practicing the concepts you learned in this lesson.

1. Create a new project using the grass template. Set up an initial scene with five bunnies, each different colors. Each bunny should be positioned about one meter apart.
    a. Declare three different procedures to have the bunnies do three exercises together. Examples of procedures could be jumping jacks, hopping up and down, running in place, or doing back flips.
    b. Within each declared procedure, declare a variable that holds the value for the distance arguments. This could be a whole number or decimal number value type.
    c. Assign the variable to one or more distance arguments within a declared procedure and run the animation.
    d. Change the value of the variable, and run the animation again to observe how it changes the bunnies' movements.
    e. Save the project.