

# 3 Introduction to Classes, Objects, Methods and Strings

## Objectives

In this chapter you'll:

- Declare a class and use it to create an object.
- Implement a class's behaviors as methods.
- Implement a class's attributes as instance variables.
- Call an object's methods to make them perform their tasks.
- Learn what local variables of a method are and how they differ from instance variables.
- Learn what primitive types and reference types are.
- Use a constructor to initialize an object's data.
- Represent and use numbers containing decimal points.
- Learn why classes are a natural way to model real-world things and abstract entities.

## Outline

1. 3.1 Introduction

2. 3.2 Instance Variables, *set* Methods and *get* Methods
  1. 3.2.1 Account Class with an Instance Variable, and *set* and *get* Methods
  2. 3.2.2 AccountTest Class That Creates and Uses an Object of Class Account
  3. 3.2.3 Compiling and Executing an App with Multiple Classes
  4. 3.2.4 Account UML Class Diagram
  5. 3.2.5 Additional Notes on Class AccountTest
  6. 3.2.6 Software Engineering with **private** Instance Variables and **public** *set* and *get* Methods
3. 3.3 Account Class: Initializing Objects with Constructors
  1. 3.3.1 Declaring an Account Constructor for Custom Object Initialization
  2. 3.3.2 Class AccountTest: Initializing Account Objects When They're Created
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  1. 3.4.1 Account Class with a **balance** Instance Variable of Type **double**
  2. 3.4.2 AccountTest Class to Use Class Account
5. 3.5 Primitive Types vs. Reference Types
6. 3.6 (Optional) GUI and Graphics Case Study: A Simple GUI
  1. 3.6.1 What is a Graphical User Interface?
  2. 3.6.2 JavaFX Scene Builder and FXML
  3. 3.6.3 **Welcome** App—Displaying Text and an Image
  4. 3.6.4 Opening Scene Builder and Creating the File **welcome.fxml**

5. 3.6.5 Adding an Image to the Folder Containing `Welcome.fxml`
6. 3.6.6 Creating a VBox Layout Container
7. 3.6.7 Configuring the VBox
8. 3.6.8 Adding and Configuring a Label
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10. 3.6.10 Previewing the **Welcome** GUI

7. 3.7 Wrap-Up

1. Summary
2. Self-Review Exercises
3. Answers to Self-Review Exercises
4. Exercises
5. Making a Difference