SR 2.1 What is a string literal?

A string literal is a sequence of characters delimited by double quotes.

SR 2.9 What is a variable declaration?

A variable declaration establishes the name of a variable and the type of data that it can contain. A declaration may also have an optional initialization, which gives the variable an initial value.

SR 2.14 What is primitive data? How are primitive data types different from objects?

Primitive data are basic values such as numbers or characters. Objects are more complex entities that usually contain primitive data that help define them.

SR 2.19 What is a character set?

A character set is a list of characters in a particular order. A character set defines the valid characters that a particular type of computer or programming language will support. Java uses the Unicode character set.

SR 2.31 Why are widening conversions safer than narrowing conversions?

A widening conversion tends to go from a small data value, in terms of the amount of space used to store it, to a larger one. A narrowing conversion does the opposite. Information is more likely to be lost in a narrowing conversion, which is why narrowing conversions are considered to be less safe than widening ones.

SR 3.1 What is a null reference?

A null reference is a reference that does not refer to any object. The reserved word null can be used to check for null references before following them.

SR 3.2 What does the new operator accomplish?

The new operator creates a new instance (an object) of the specified class. The constructor of the class is then invoked to help set up the newly created object.

SR 3.5 What is an alias? How does it relate to garbage collection?

Two references are aliases of each other if they refer to the same object. Changing the state of the object through one reference changes it for the other because there is actually only one object. An object is marked for garbage collection only when there are no valid references to it.

SR 3.10 What is a Java package?

A Java package is a collection of related classes. The Java standard class library is a group of packages that support common programming tasks.

SR 3.14 What does an import statement accomplish?

An import statement establishes the fact that a program uses a particular class, specifying what package that class is a part of. This allows the programmer to use the class name (such as Random) without having to fully qualify the reference (such as java.util.Random) every time.

SR 3.20 What is a class method (also called a static method)?

A class or static method can be invoked through the name of the class that contains it, such as Math.abs. If a method is not static, it can be executed only through an instance (an object) of the class.

SR 3.31 Why use an enumerated type such as CardSuit defined in the previous question? Why not just use String variables and assign them values such as "hearts"?

By using an enumerated type, you guarantee that variables of that type will only take on the enumerated values.

SR 3.32 How can we represent a primitive value as an object?

A wrapper class is defined in the Java standard class library for each primitive type. In situations where objects are called for, an object created from a wrapper class may suffice.

SR 3.36 In what situation might you omit the main method in a JavaFX application?

If the IDE you’re using will automatically launch a JavaFX application, no main method is needed. Otherwise, a one-line main method calling the launch method is required.

SR 3.37 What is a stage in the JavaFX theatre metaphor?

A JavaFX stage is a window in which a scene is displayed. The primary stage of a JavaFX application is automatically created and passed into the start method.

SR 3.38 What does the root node of a scene contain?

The root node of a scene contains all nodes displayed in the scene.

SR 3.45 What is an RGB value?

An RGB value is a set of three integer values that represent a color by specifying the relative contributions of the colors red, green, and blue.

SR 4.1 What is an attribute?

An attribute is a data value stored in an object and defines a particular characteristic of that object. For example, one attribute of a Student object might be that student’s current grade point average. Collectively, the values of an object’s attributes determine that object’s current state.

SR 4.2 What is an operation?

An operation is a function that can be done to or done by an object. For example, one operation of a Student object might be to compute that student’s current grade point average. Collectively, an object’s operations are referred to as the object’s behaviors.

SR 4.5 What is the difference between an object and a class?

A class is the blueprint of an object. It defines the variables and methods that will be a part of every object that is instantiated from it. But a class reserves no memory space for variables. Each object has its own data space and, therefore, its own state.

SR 4.6 Describe the instance data of the Die class.

The instance data of the Die class are MAX, an integer constant equal to 6 that represents the number of faces on the die and therefore the maximum value of the die, and faceValue, an integer variable that represents the current “up” or face value of the die.

SR 4.8 What happens when you pass an object to a print or println method?

When you pass an object to a print or println method, the toString method of the object is called automatically to obtain a string description of the object. If no toString method is defined for the object, then a default string is used. Therefore, it is usually a good idea to define a toString method when defining classes.

SR 4.9 What is the scope of a variable?

The scope of a variable is the area within a program in which the variable can be referenced. An instance variable, declared at the class level, can be referenced in any method of the class. Local variables, including the formal parameters, declared within a particular method, can be referenced only in that method.

SR 4.10 What are UML diagrams designed to do?

A UML diagram helps us visualize the entities (classes and objects) in a program as well as the relationships among them. UML diagrams are tools that help us capture the design of a program prior to writing it.

SR 4.11 Objects should be self-governing. Explain.

A self-governing object is one that controls the values of its own data. Encapsulated objects, which don’t allow an external client to reach in and change its data, are self-governing.

SR 4.12 What is the interface to an object?

An object’s interface is the set of public operations (methods) defined on it. That is, the interface establishes the set of services the object will perform for the rest of the system.

SR 4.13 What is a modifier?

A modifier is a Java reserved word that can be used in the definition of a variable or method and that specifically defines certain characteristics of its use. For example, by declaring a variable with private visibility, the variable cannot be directly accessed outside of the object in which it is defined.

SR 4.20 Explain the difference between an actual parameter and a formal parameter.

An actual parameter is a value sent to a method when it is invoked. A formal parameter is the corresponding variable in the header of the method declaration; it takes on the value of the actual parameter so that it can be used inside the method.

SR 4.24 What are constructors used for?

Constructors are special methods in an object that are used to initialize the object when it is instantiated.

SR 4.25 How are constructors defined?

A constructor has the same name as its class, and it does not return a value.

SR 4.32 What is the relationship among GUI controls, events, and event handlers?

A GUI control generates an event, typically when the user interacts with the control. A programmer sets up an event handler to execute certain code when an event occurs.

SR 4.34 Summarize the three techniques for defining a JavaFX event handler.

A JavaFX event handler can be defined using (1) a method reference, which specifies which method will be invoked when the event occurs, (2) a full class that implements the appropriate event handler interface, or (3) a lambda expression that defines the code to be executed right in the call to set the event handler. These are all notational variations of the same approach.