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CMIS 141
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Homework 2:
Java Class named Guitar

INPUT	EXPECTED OUTPUT	ACTUAL OUTPUT	PASS ?
Constructor: numStrings=6 guitarLength=28.2 guitarManufacturer=Gibson guitarColor=red	**Output** toString(): (Number of Strings = 6, Guitar Length = 28.2, Guitar Manufacturer = Gibson, Guitar Color = red) getStrings(): 6 getLength(): 28.2 getManufacturer(): Gibson getColor(): red playGuitar(): [G(2.0),G(4.0),C(4.0),A(0.5),F(1.0),G(0.25),G(1.0),F(0.25),E(2.0),F(0.5),G(4.0),F(0.25),E(1.0),C(0.5),E(1.0),C(1.0)]	**Output** toString(): (Number of Strings = 6, Guitar Length = 28.2, Guitar Manufacturer = Gibson, Guitar Color = red) getStrings(): 6 getLength(): 28.2 getManufacturer(): Gibson getColor(): red playGuitar(): [G(2.0),G(4.0),C(4.0),A(0.5),F(1.0),G(0.25),G(1.0),F(0.25),E(2.0),F(0.5),G(4.0),F(0.25),E(1.0),C(0.5),E(1.0),C(1.0)]	YES
Constructor: numStrings=10 guitarLength=24 guitarManufacturer=Les Paul guitarColor=blue	**Output** toString(): (Number of Strings = 10, Guitar Length = 24.0, Guitar Manufacturer = Les Paul, Guitar Color = blue) getStrings(): 10 getLength(): 24.0 getManufacturer(): Les Paul getColor(): blue playGuitar(): [F(0.25),E(2.0),A(1.0),D(0.25),C(1.0),F(1.0),C(0.25),B(0.25),E(0.25),C(0.5),C(1.0),F(0.25),B(2.0),D(2.0),D(0.25),C(1.0)]	**Output** toString(): (Number of Strings = 10, Guitar Length = 24.0, Guitar Manufacturer = Les Paul, Guitar Color = blue) getStrings(): 10 getLength(): 24.0 getManufacturer(): Les Paul getColor(): blue playGuitar(): [F(0.25),E(2.0),A(1.0),D(0.25),C(1.0),F(1.0),C(0.25),B(0.25),E(0.25),C(0.5),C(1.0),F(0.25),B(2.0),D(2.0),D(0.25),C(1.0)]	YES
Constructor: numStrings=8 guitarLength=30 guitarManufacturer=Stratocaster guitarColor=yellow	**Output** toString(): (Number of Strings = 8, Guitar Length = 30.0, Guitar Manufacturer = Stratocaster, Guitar Color = yellow) getStrings(): 8 getLength(): 30.0 getManufacturer(): Stratocaster getColor(): yellow playGuitar(): [E(1.0),C(0.5),C(1.0),D(1.0),B(0.5),B(0.25),F(0.5),G(0.5),G(1.0),G(0.25),A(0.5),B(1.0),G(2.0),D(4.0),C(4.0),B(0.25)]	**Output** toString(): (Number of Strings = 8, Guitar Length = 30.0, Guitar Manufacturer = Stratocaster, Guitar Color = yellow) getStrings(): 8 getLength(): 30.0 getManufacturer(): Stratocaster getColor(): yellow playGuitar(): [E(1.0),C(0.5),C(1.0),D(1.0),B(0.5),B(0.25),F(0.5),G(0.5),G(1.0),G(0.25),A(0.5),B(1.0),G(2.0),D(4.0),C(4.0),B(0.25)]	YES

Guitar 1 Test Output Example

```
Guitar1 information is listed below:  
toString(): (Number of Strings = 6, Guitar Length = 28.2, Guitar Manufacturer = Gibson, Guitar Color = red)  
getStrings(): 6  
getLength(): 28.2  
getManufacturer(): Gibson  
getColor(): red  
playGuitar(): [G(2.0),G(4.0),C(4.0),A(0.5),F(1.0),G(0.25),G(1.0),F(0.25),E(2.0),F(0.5),G(4.0),F(0.25),E(1.0),C(0.5),E(1.0),C(1.0)]
```

Guitar 2 Test Output Example

```
Guitar2 information is listed below:  
toString(): (Number of Strings = 10, Guitar Length = 24.0, Guitar Manufacturer = Les Paul, Guitar Color = blue)  
getStrings(): 10  
getLength(): 24.0  
getManufacturer(): Les Paul  
getColor(): blue  
playGuitar(): [F(0.25),E(2.0),A(1.0),D(0.25),C(1.0),F(1.0),C(0.25),B(0.25),E(0.25),C(0.5),C(1.0),F(0.25),B(2.0),D(2.0),D(0.25),C(1.0)]
```

Guitar 3 Test Output Example

```
Guitar3 information is listed below:  
toString(): (Number of Strings = 8, Guitar Length = 30.0, Guitar Manufacturer = Stratocaster, Guitar Color = yellow)  
getStrings(): 8  
getLength(): 30.0  
getManufacturer(): Stratocaster  
getColor(): yellow  
playGuitar(): [E(1.0),C(0.5),C(1.0),D(1.0),B(0.5),B(0.25),F(0.5),G(0.5),G(1.0),G(0.25),A(0.5),B(1.0),G(2.0),D(4.0),C(4.0),B(0.25)]
```

Guitar Class Code Example

```
/*
 * File: Guitar.java
 * Author: Ben Brandhorst
 * Date: November 15, 2018
 * Purpose: Homework 2
 */

import java.util.Random;

public class Guitar {
    private int numStrings;
    private double guitarLength;
    private String guitarManufacturer;
    public Color guitarColor;

    enum Color {
        red, green, blue, yellow, black, white, orange, violet
    }

    // Default constructor for standard 6 string, 28.2 inch, red, Gibson guitar
    public Guitar() {
        numStrings = 6;
        guitarLength = 28.2;
        guitarManufacturer = ("Gibson");
        guitarColor = Color.red; // Identifies the default color as red
    }

    // Constructor which allows a specified number of strings, guitar length, manufacturer, and guitar
    // color
    public Guitar(int numStrings, double guitarLength, String guitarManufacturer, Color guitarColor) {
        this.numStrings = numStrings;
        this.guitarLength = guitarLength;
        this.guitarManufacturer = guitarManufacturer;
        this.guitarColor = guitarColor;
    }

    // Define Getter methods
    // Get number of guitar strings
    public int getStrings() {
        return this.numStrings;
    }

    // Get length of guitar
    public double getLength() {
        return this.guitarLength;
    }

    // Get guitar manufacturer
    public String getManufacturer() {
        return this.guitarManufacturer;
    }

    // Get guitar color
    public Color getColor() {
        return this.guitarColor;
    }
}
```

Guitar Class Code Example Continued

```
// This plays 16 random notes and note lengths
public String playGuitar() {
    // This line is used with the one below to help select a random letter A-G
    Random a = new Random();
    // This pulls a random ASCII character A-G (1=A,2=B,3=C, etc) the capital 'A' at the end
    // capitalizes the returned letters
    char note = (char) (a.nextInt(7) + 'A');
    // This is used to randomly select one of the five strings the in the line below it
    int b = (int) (Math.random() * 5);
    // String input of the note lengths used
    String length = new String[] {".25", ".5", "1", "2", "4"}[b];
    // I put all of the brackets and commas into Strings so I could easily call them later on
    String open = "[";
    String close = "]";
    String comma = ",";
    String left = "(";
    String right = ")";
    String printOut = " "; // Empty String to hold values later
    // This line runs a single time and allows me to insert an opening bracket along with a note and
    // note length before starting the loop
    printOut = open + note + left + length + right + comma;
    /// The for loop that runs 15 times to generate random notes and note lengths
    for (int i = 1; i < 16; i++) {
        // This isn't the cleanest code but I couldn't figure out how to pull random notes and lengths
        // without creating a second set of variables within the loop.
        Random c = new Random();
        char otherNote = (char) (c.nextInt(7) + 'A');
        int d = (int) (Math.random() * 5);
        String otherLength = new String[] {".25", ".5", "1", "2", "4"}[d];
        // Prints out notes and note lengths
        printOut = printOut + otherNote + left + otherLength + right;
        // if statement that puts a comma between notes
        if (i != 15)
            printOut = printOut + comma;
    }
    // After the loop finishes this inserts the closing bracket
    printOut = printOut + close;
    return printOut;
}

// Lists all the Getter information for the guitar in a string format
public String toString() {
    String guitarInfo = "(Number of Strings = " + this.numStrings + ", Guitar Length = "
        + this.guitarLength + ", Guitar Manufacturer = " + this.guitarManufacturer
        + ", Guitar Color = " + this.guitarColor + ")";
    return guitarInfo;
}
```

Test Guitar Program Code Example

```
/*
 * File: TestGuitar.java
 * Author: Ben Brandhorst
 * Date: November 14, 2018
 * Purpose: This program tests my creation of the Java class named Guitar. It creates three objects with different method outputs
 * and then displays requested information about those three objects
 */
public class TestGuitar {
    public static void main(String[] args) {

        // Creates 3 unique Guitars
        Guitar guitar1 = new Guitar();
        Guitar guitar2 = new Guitar(10, 24, "Les Paul", Guitar.Color.blue);
        Guitar guitar3 = new Guitar(8, 30, "Stratocaster", Guitar.Color.yellow);
        // Calls all getter methods along with the toString and playGuitar() methods for guitar1
        System.out.println("Guitar1 information is listed below: ");
        System.out.print("toString(): ");
        System.out.println(guitar1.toString());
        System.out.print("getStrings(): ");
        System.out.println(guitar1.getStrings());
        System.out.print("getLength(): ");
        System.out.println(guitar1.getLength());
        System.out.print("getManufacturer(): ");
        System.out.println(guitar1.getManufacturer());
        System.out.print("getColor(): ");
        System.out.println(guitar1.getColor());
        System.out.print("playGuitar(): ");
        System.out.println(guitar1.playGuitar());
        System.out.println("");
        // Same as above but this time for guitar2
        System.out.println("Guitar2 information is listed below: ");
        System.out.print("toString(): ");
        System.out.println(guitar2.toString());
        System.out.print("getStrings(): ");
        System.out.println(guitar2.getStrings());
        System.out.print("getLength(): ");
        System.out.println(guitar2.getLength());
        System.out.print("getManufacturer(): ");
        System.out.println(guitar2.getManufacturer());
        System.out.print("getColor(): ");
        System.out.println(guitar2.getColor());
        System.out.print("playGuitar(): ");
        System.out.println(guitar2.playGuitar());
        System.out.println("");
        // Same as above but this time for guitar3
        System.out.println("Guitar3 information is listed below: ");
        System.out.print("toString(): ");
        System.out.println(guitar3.toString());
        System.out.print("getStrings(): ");
        System.out.println(guitar3.getStrings());
        System.out.print("getLength(): ");
        System.out.println(guitar3.getLength());
        System.out.print("getManufacturer(): ");
        System.out.println(guitar3.getManufacturer());
        System.out.print("getColor(): ");
        System.out.println(guitar3.getColor());
        System.out.print("playGuitar(): ");
        System.out.println(guitar3.playGuitar());
    }
}
```