

## Lab: Musical Instrument Strategies

In this lab, you design interfaces and classes that implement the Strategy design pattern. Be sure to read Chapter 1 in Head-First Design Patterns first. Musical instruments are classified into families, based on the way they are played. The woodwind family (clarinet, bassoon, etc) are played by buzzing a wooden reed. The brass family are played by blowing and buzzing the lips against a metal mouthpiece. The string family is played by drawing a bow across the strings. A related family, the plucked strings (guitar, harp) are played by plucking strings with the fingers. Your task is to create a class structure that allows a test program to create several instruments, with at least one of each family type. Call a display method that displays the instrument name, and call a performPlay method that prints out the way in which the instrument is played. Create an abstract Instrument class, and extend it with specific instrument classes (Tuba, Violin, etc.). Create a PlayBehavior interface, and create classes that implement this interface with specific ways of playing (bowing, plucking, buzzing, etc.). Use my test program (named MusicInstrumentSimulator.java.txt) as your program entry point. This is your expected output:

```
I am a violin.
```

```
Play me with a bow.
```

```
I am a tuba.
```

```
Play me by blowing and buzzing your lips.
```

```
I am a clarinet.
```

```
Play me by blowing and buzzing a reed.
```

```
I am a harp.
```

```
Play me by plucking my strings.
```

```
I am a double bass.
```

```
Play me with a bow.
```

```
Play me with a bow.
```

```
Play me by plucking my strings.
```