Chapter 4 - 4.11 Exercises

Exercise 1

1. **What is the output of the following program? Be precise about where there are spaces and where there are newlines.**

   Hint: **Start by describing in words what `ping` and `baffle` do when they are invoked.**

```
pre03/test.java ×
1    import java.io.*;
2    import java.util.*;
3
4 ▼ public class test {
5
6 ▼   public static void zoop() {
7          baffle();
8          System.out.print("You wugga ");
9          baffle();
10   }
11
12 ▼ public static void main(String[] args) {
13         System.out.print("No, I ");
14         zoop();
15         System.out.print("I ");
16         baffle();
17   }
18
19 ▼ public static void baffle() {
20         System.out.print("wug");
21         ping();
22   }
23
24 ▼ public static void ping() {
25         System.out.println(".");
26   }
27   }
```

```
~/cohort-3-prework-theawilliams19/pre03$ java test
No, I wug.
You wugga wug.
I wug.
~/cohort-3-prework-theawilliams19/pre03$
```

Main method prints "No, I " (line 13) then it invokes zoop (line 14). Space is created because it is included within the quotes of the String.

The program then goes to line 6.

Zoop (line 7) invokes baffle (line 19).

Baffle (line 20) prints "wug", then it invokes the ping method (line 21).

Ping prints period (line 25). A new line is created because ping uses a println rather than a print variable.

Control returns to the baffle method (line 21) because this method was the method that invoked it just prior.

Control returns to the zoop method (line 7) because this method was the method that invoked it just prior.

The zoop method prints "You wugga " (line 8). Space is created because it is included within the quotes of the String.

The zoop method invokes the baffle method again (line 9).

The baffle method prints "wug" (line 20).

The baffle method then invokes the ping method (line 21).

The ping method prints a period (line 25). A new line is created because ping uses a println rather than a print variable.

Control returns to the baffle method (line 21) because this method was the method that invoked it just prior.

Control returns to the zoop method (line 9) because this method was the method that invoked it just prior.

There is no more code to run in zoop, so control returns to the main method (line 15) because this method was the method that invoked it just prior.

The main method prints "I " (line 15). Space is created because it is included within the quotes of the String.

The main method invokes the baffle method (line 16).

The baffle method prints "wug" (line 20).

The baffle method invokes the ping method (21).

The ping method prints the period (line 25). A new line is created because ping uses a println rather than a print variable.

The ping ends.
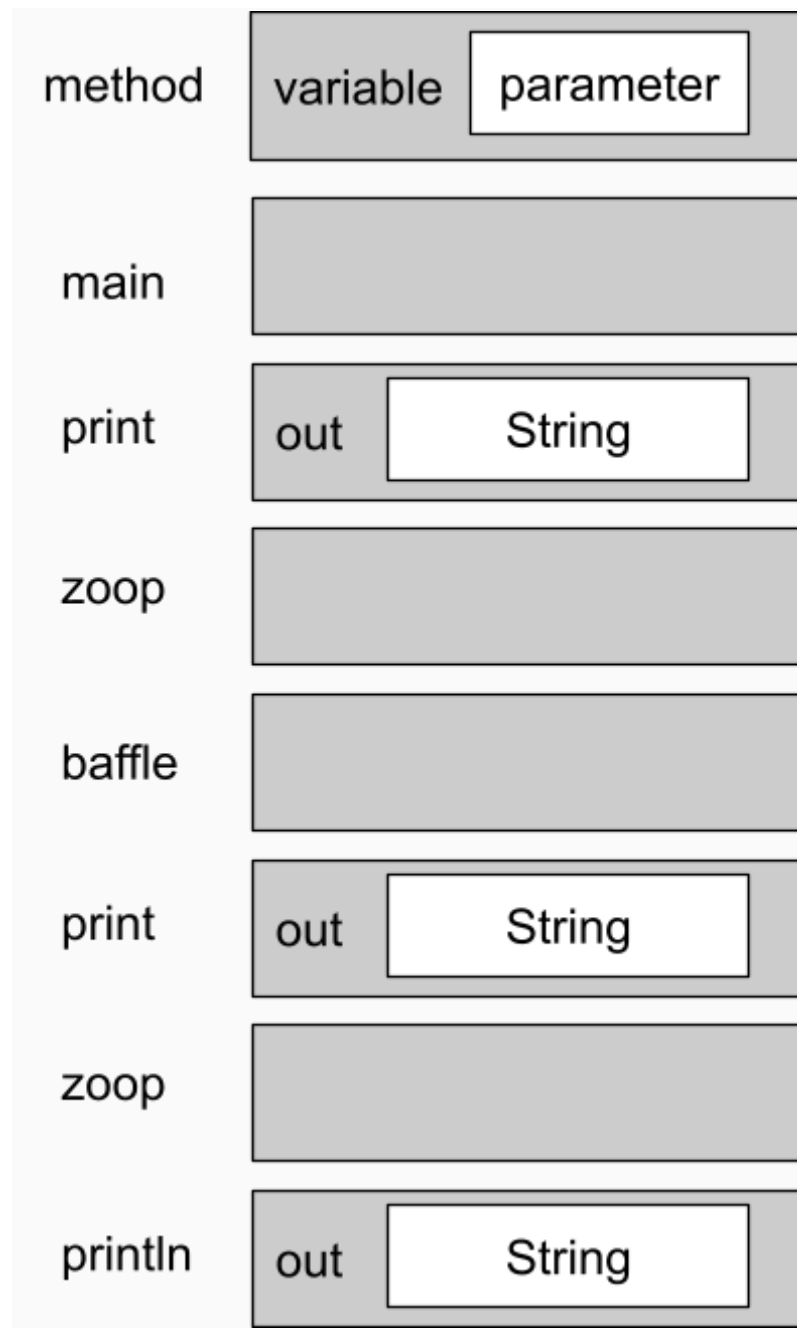
Control returns to the baffle method (line 21).

Baffles ends, so it returns to zoop (line 9) because that is the method that previously invoked it.

Zoop ends and returns to main.

The main method ends and therefore the program ends.

Exercise 1

2. Draw a stack diagram that shows the state of the program the first time `ping` is invoked.

method	variable	parameter

main	

print	out	String

zoop	

baffle	

print	out	String

zoop	

println	out	String

Exercise 1

3. What happens if you invoke `baffle();` at the end of the `ping` method?
(We will see why in the next chapter.)

```
 7    baffle();
 8        System.out.print("You wugga ");
 9        baffle();
10    }
11
12 ▾ public static void main(String[] args) {
13        System.out.print("No, I ");
14        zoop();
15        System.out.print("I ");
16        baffle();
17    }
18
19 ▾ public static void baffle() {
20        System.out.print("wug");
21        ping();
22    }
23
24 ▾ public static void ping() {
25        System.out.println(".");
26        baffle();
27    }
28    }
```

```
        at java.base/sun.nio.cs.StreamEncoder.writeBytes(S
Encoder.java:233)
        at java.base/sun.nio.cs.StreamEncoder.implFlushBuffer(S
treamEncoder.java:312)
        at java.base/sun.nio.cs.StreamEncoder.flushBuffer(Strea
mEncoder.java:104)
        at java.base/java.io.OutputStreamWriter.flushBuffer(Out
putStreamWriter.java:181)
        at java.base/java.io.PrintStream.write(PrintStream.java
:606)
        at java.base/java.io.PrintStream.print(PrintStream.java
:745)
        at test.baffle(test.java:20)
        at test.ping(test.java:26)
        at test.baffle(test.java:21)
        at test.ping(test.java:26)
        at test.baffle(test.java:21)
        at test.ping(test.java:26)
        at test.baffle(test.java:21)
        at test.ping(test.java:26)
        at test.baffle(test.java:21)
        at test.ping(test.java:26)
        at test.baffle(test.java:21)
        at test.ping(test.java:26)
        at test.baffle(test.java:21)
        at test.ping(test.java:26)
        at test.baffle(test.java:21)
```

If `baffle();` is invoked at the end of the `ping` method, the program compiles, but when the program is run, it jumps back and forth between both methods on line 21 and line 26 and then eventually fails.