Review Questions

The answers to the chapter review questions can be found in the Appendix.

1. Which of the following data types can be used in a `switch` expression? (Choose all that apply.)

   A. `enum`
   B. `int`
   C. `Byte`
   D. `long`
   E. `String`
   F. `char`
   G. `var`
   H. `double`

2. What is the output of the following code snippet? (Choose all that apply.)

```
3: int temperature = 4;
4: long humidity = -temperature + temperature * 3;
5: if (temperature>=4)
6: if (humidity < 6) System.out.println("Too Low");
7: else System.out.println("Just Right");
8: else System.out.println("Too High");
```

   A. `Too Low`
   B. `Just Right`
   C. `Too High`
   D. A `NullPointerException` is thrown at runtime.
   E. The code will not compile because of line 7.
   F. The code will not compile because of line 8.

3. Which of the following data types are permitted on the right side of a for-each expression? (Choose all that apply.)

   A. `Double[][]`
   B. `Object`
   C. `Map`
   D. `List`
   E. `String`
   F. `char[]`
   G. `Exception`
   H. `Set`

4. What is the output of calling `printReptile(6)`?

```
void printReptile(int category) {
  var type = switch(category) {
      case 1,2 -> "Snake";
      case 3,4 -> "Lizard";
      case 5,6 -> "Turtle";
      case 7,8 -> "Alligator";
   };
   System.out.print(type);
}
```

   A. `Snake`
   B. `Lizard`
   C. `Turtle`
   D. `Alligator`
   E. `TurtleAlligator`
   F. None of the above

5. What is the output of the following code snippet?

```
List<Integer> myFavoriteNumbers = new ArrayList<>();
myFavoriteNumbers.add(10);
myFavoriteNumbers.add(14);
for (var a : myFavoriteNumbers) {
   System.out.print(a + ", ");
   break;
}

for (int b : myFavoriteNumbers) {
   continue;
   System.out.print(b + ", ");
}

for (Object c : myFavoriteNumbers)
   System.out.print(c + ", ");
```

   A. It compiles and runs without issue but does not produce any output.
   B. `10, 14,`
   C. `10, 10, 14,`
   D. `10, 10, 14, 10, 14,`
   E. Exactly one line of code does not compile.
   F. Exactly two lines of code do not compile.
   G. Three or more lines of code do not compile.
   H. The code contains an infinite loop and does not terminate.

6. Which statements about decision structures are true? (Choose all that apply.)

A. A for-each loop can be executed on any Collections Framework object.

B. The body of a `while` loop is guaranteed to be executed at least once.

C. The conditional expression of a `for` loop is evaluated before the first execution of the loop body.

D. A `switch` expression that takes a `String` and assigns the result to a variable requires a `default` branch.

E. The body of a `do/while` loop is guaranteed to be executed at least once.

F. An `if` statement can have multiple corresponding `else` statements.

7. Assuming `weather` is a well-formed nonempty array, which code snippet, when inserted independently into the blank in the following code, prints all of the elements of `weather`? (Choose all that apply.)

```
private void print(int[] weather) {
   for(____________________) {
      System.out.println(weather[i]);
   }
}
```

A. `int i=weather.length; i>0; i--`

B. `int i=0; i<=weather.length-1; ++i`

C. `var w : weather`

D. `int i=weather.length-1; i>=0; i--`

E. `int i=0, int j=3; i<weather.length; ++i`

F. `int i=0; ++i<10 && i<weather.length;`

G. None of the above

8. What is the output of calling `printType(11)`?

```
31: void printType(Object o) {
32:    if(o instanceof Integer bat) {
33:       System.out.print("int");
34:    } else if(o instanceof Integer bat && bat < 10) {
35:       System.out.print("small int");
36:    } else if(o instanceof Long bat || bat <= 20) {
37:       System.out.print("long");
38:    } default {
39:       System.out.print("unknown");
40:    }
41: }
```

A. `int`

B. `small int`

C. `long`

D. `unknown`

E. Nothing is printed.

F. The code contains one line that does not compile.

G. The code contains two lines that do not compile.

H. None of the above

9. Which statements, when inserted independently into the following blank, will cause the code to print 2 at runtime? (Choose all that apply.)

```
int count = 0;
BUNNY: for(int row = 1; row <=3; row++)
   RABBIT: for(int col = 0; col <3 ; col++) {
      if((col + row) % 2 == 0)
         ____________________;
      count++;
   }
System.out.println(count);
```

A. `break BUNNY`

B. `break RABBIT`

C. `continue BUNNY`

D. `continue RABBIT`

E. `break`

F. `continue`

G. None of the above, as the code contains a compiler error.

10. Given the following method, how many lines contain compilation errors? (Choose all that apply.)

```
10: private DayOfWeek getWeekDay(int day, final int thursday) {
11:    int otherDay = day;
12:    int Sunday = 0;
13:    switch(otherDay) {
14:       default:
15:       case 1: continue;
16:       case thursday: return DayOfWeek.THURSDAY;
17:       case 2,10: break;
```

```
18:        case Sunday: return DayOfWeek.SUNDAY;
19:        case DayOfWeek.MONDAY: return DayOfWeek.MONDAY;
20:     }
21:     return DayOfWeek.FRIDAY;
22: }
```

A. None, the code compiles without issue.

B. 1

C. 2

D. 3

E. 4

F. 5

G. 6

H. The code compiles but may produce an error at runtime.

11. What is the output of calling `printLocation(Animal.MAMMAL)`?

```
10: class Zoo {
11:     enum Animal {BIRD, FISH, MAMMAL}
12:     void printLocation(Animal a) {
13:        long type = switch(a) {
14:           case BIRD -> 1;
15:           case FISH -> 2;
16:           case MAMMAL -> 3;
17:           default -> 4;
18:        };
19:        System.out.print(type);
20:     } }
```

A. `3`

B. `4`

C. `34`

D. The code does not compile because of line 13.

E. The code does not compile because of line 17.

F. None of the above

12. What is the result of the following code snippet?

```
3: int sing = 8, squawk = 2, notes = 0;
4: while(sing > squawk) {
5:    sing--;
6:    squawk += 2;
```

```
7:    notes += sing + squawk;
8: }
9: System.out.println(notes);
```

A. 11
B. 13
C. 23
D. 33
E. 50
F. The code will not compile because of line 7.

13. What is the output of the following code snippet?

```
2: boolean keepGoing = true;
3: int result = 15, meters = 10;
4: do {
5:    meters--;
6:    if(meters==8) keepGoing = false;
7:    result -= 2;
8: } while keepGoing;
9: System.out.println(result);
```

A. 7
B. 9
C. 10
D. 11
E. 15
F. The code will not compile because of line 6.
G. The code does not compile for a different reason.

14. Which statements about the following code snippet are correct? (Choose all that apply.)

```
for(var penguin : new int[2])
   System.out.println(penguin);
var ostrich = new Character[3];
for(var emu : ostrich)
   System.out.println(emu);
List<Integer> parrots = new ArrayList<Integer>();
for(var macaw  : parrots)
   System.out.println(macaw);
```

A. The data type of `penguin` is `Integer`.

B. The data type of `penguin` is `int`.

C. The data type of `emu` is undefined.

D. The data type of `emu` is `Character`.

E. The data type of `macaw` is `List`.

F. The data type of `macaw` is `Integer`.

G. None of the above, as the code does not compile.

15. What is the result of the following code snippet?

```
final char a = 'A', e = 'E';
char grade = 'B';
switch (grade) {
   default:
   case a:
   case 'B': 'C': System.out.print("great ");
   case 'D': System.out.print("good "); break;
   case e:
   case 'F': System.out.print("not good ");
}
```

A. `great`

B. `great good`

C. `good`

D. `not good`

E. The code does not compile because the data type of one or more `case` statements does not match the data type of the `switch` variable.

F. None of the above

16. Given the following array, which code snippets print the elements in reverse order from how they are declared? (Choose all that apply.)

```
char[] wolf = {'W', 'e', 'b', 'b', 'y'};
```

A.

```
int q = wolf.length;
for( ; ; ) {
   System.out.print(wolf[--q]);
   if(q==0) break;
}
```

B.

```
for(int m=wolf.length-1; m>=0; --m)
   System.out.print(wolf[m]);
```

C.

```
for(int z=0; z<wolf.length; z++)
   System.out.print(wolf[wolf.length-z]);
```

D.

```
int x = wolf.length-1;
for(int j=0; x>=0 && j==0; x--)
   System.out.print(wolf[x]);
```

E.

```
final int r = wolf.length;
for(int w = r-1; r>-1; w = r-1)
   System.out.print(wolf[w]);
```

F.

```
for(int i=wolf.length; i>0; --i)
   System.out.print(wolf[i]);
```

G. None of the above

17. What distinct numbers are printed when the following method is executed? (Choose all that apply.)

```
private void countAttendees() {
   int participants = 4, animals = 2, performers = -1;
   while((participants = participants+1) < 10) {}
   do {} while (animals++ <= 1);
   for( ; performers<2; performers+=2) {}

   System.out.println(participants);
   System.out.println(animals);
   System.out.println(performers);
}
```

A. 6

B. 3

C. 4

D. 5

E. 10

F. 9

G. The code does not compile.

H. None of the above

18. Which statements about pattern matching and flow scoping are correct? (Choose all that apply.)

A. Pattern matching with an `if` statement is implemented using the `instance` operator.

B. Pattern matching with an `if` statement is implemented using the `instanceon` operator.

C. Pattern matching with an `if` statement is implemented using the `instanceof` operator.

D. The pattern variable cannot be accessed after the `if` statement in which it is declared.

E. Flow scoping means a pattern variable is only accessible if the compiler can discern its type.

F. Pattern matching can be used to declare a variable with an `else` statement.

19. What is the output of the following code snippet?

```
2: double iguana = 0;
3: do {
4:    int snake = 1;
5:    System.out.print(snake++ + " ");
6:    iguana--;
7: } while (snake <= 5);
8: System.out.println(iguana);
```

A. `1 2 3 4 -4.0`

B. `1 2 3 4 -5.0`

C. `1 2 3 4 5 -4.0`

D. `0 1 2 3 4 5 -5.0`

E. The code does not compile.

F. The code compiles but produces an infinite loop at runtime.

G. None of the above

20. Which statements, when inserted into the following blanks, allow the code to compile and run without entering an infinite loop? (Choose all that apply.)

```
4:  int height = 1;
5:  L1: while(height++ <10) {
6:     long humidity = 12;
7:     L2: do {
8:        if(humidity-- % 12 == 0) _____ ;
9:        int temperature = 30;
10:       L3: for( ; ; ) {
11:          temperature++;
12:          if(temperature>50) _____;
13:       }
14:    } while (humidity > 4);
15: }
```

A. `break L2` on line 8; `continue L2` on line 12

B. `continue` on line 8; `continue` on line 12

C. `break L3` on line 8; `break L1` on line 12

D. `continue L2` on line 8; `continue L3` on line 12

E. `continue L2` on line 8; `continue L2` on line 12

F. None of the above, as the code contains a compiler error

21. A minimum of how many lines need to be corrected before the following method will compile?

```
21: void findZookeeper(Long id) {
22:    System.out.print(switch(id) {
23:       case 10 -> {"Jane"}
24:       case 20 -> {yield "Lisa";};
25:       case 30 -> "Kelly";
26:       case 30 -> "Sarah";
27:       default -> "Unassigned";
28:    });
29: }
```

A. Zero

B. One

C. Two

D. Three

E. Four

F. Five

22. What is the output of the following code snippet? (Choose all that apply.)

```
2: var tailFeathers = 3;
3: final var one = 1;
4: switch (tailFeathers) {
5:    case one: System.out.print(3 + " ");
6:    default: case 3: System.out.print(5 + " ");
7: }
8: while (tailFeathers > 1) {
9:    System.out.print(--tailFeathers + " "); }
```

A. `3`

B. `5 1`

C. `5 2`

D. `3 5 1`

E. `5 2 1`

F. The code will not compile because of lines 3–5.

G. The code will not compile because of line 6.

23. What is the output of the following code snippet?

```
15: int penguin = 50, turtle = 75;
16: boolean older = penguin >= turtle;
17: if (older = true) System.out.println("Success");
18: else System.out.println("Failure");
19: else if(penguin != 50) System.out.println("Other");
```

A. `Success`

B. `Failure`

C. `Other`

D. The code will not compile because of line 17.

E. The code compiles but throws an exception at runtime.

F. None of the above

24. Which of the following are possible data types for `friends` that would allow the code to compile? (Choose all that apply.)

```
for(var friend in friends) {
   System.out.println(friend);
}
```

A. `Set`

B. `Map`

C. `String`

D. `int[]`

E. `Collection`

F. `StringBuilder`

G. None of the above

25. What is the output of the following code snippet?

```
6:  String instrument = "violin";
7:  final String CELLO = "cello";
8:  String viola = "viola";
9:  int p = -1;
10: switch(instrument) {
11:    case "bass" : break;
12:    case CELLO : p++;
13:    default: p++;
14:    case "VIOLIN": p++;
15:    case "viola" : ++p; break;
16: }
17: System.out.print(p);
```

A. `-1`

B. `0`

C. `1`

D. `2`

E. `3`

F. The code does not compile.

26. What is the output of the following code snippet? (Choose all that apply.)

```
9:  int w = 0, r = 1;
10: String name = "";
11: while(w < 2) {
12:    name += "A";
13:    do {
14:       name += "B";
15:       if(name.length()>0) name += "C";
16:       else break;
17:    } while (r <=1);
18:    r++; w++; }
19: System.out.println(name);
```

A. `ABC`

B. `ABCABC`

C. `ABCABCABC`

D. Line 15 contains a compilation error.

E. Line 18 contains a compilation error.

F. The code compiles but never terminates at runtime.

G. The code compiles but throws a `NullPointerException` at runtime.

27. What is printed by the following code snippet?

```
23: byte amphibian = 1;
24: String name = "Frog";
25: String color = switch(amphibian) {
26:    case 1 -> { yield "Red"; }
27:    case 2 -> { if(name.equals("Frog")) yield "Green"; }
28:    case 3 -> { yield "Purple"; }
29:    default -> throw new RuntimeException();
30: };
31: System.out.print(color);
```

A. `Red`
B. `Green`
C. `Purple`
D. `RedPurple`
E. An exception is thrown at runtime.
F. The code does not compile.

28. What is the output of calling `getFish("goldie")`?

```
40: void getFish(Object fish) {
41:    if (!(fish instanceof String guppy))
42:       System.out.print("Eat!");
43:    else if (!(fish instanceof String guppy)) {
44:       throw new RuntimeException();
45:    }
46:    System.out.print("Swim!");
47: }
```

A. `Eat!`
B. `Swim!`
C. `Eat!` followed by an exception.
D. `Eat!Swim!`
E. An exception is printed.
F. None of the above

29. What is the result of the following code?

```
1: public class PrintIntegers {
2:    public static void main(String[] args) {
3:       int y = -2;
4:       do System.out.print(++y + " ");
5:       while(y <= 5);
6: } }
```

A. `-2 -1 0 1 2 3 4 5`
B. `-2 -1 0 1 2 3 4`
C. `-1 0 1 2 3 4 5 6`
D. `-1 0 1 2 3 4 5`
E. The code will not compile because of line 5.
F. The code contains an infinite loop and does not terminate.