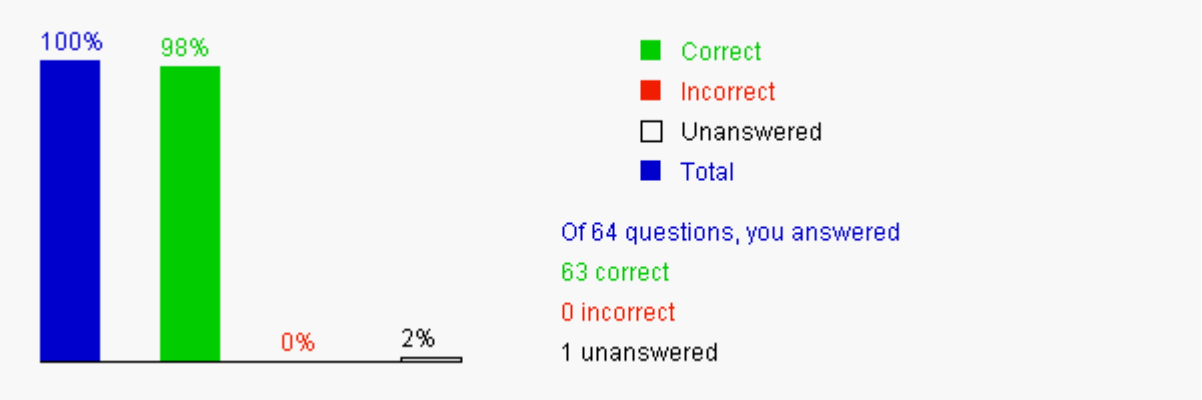
This quiz is for students to practice. A large number of additional quiz is available for instructors using Quiz Generator from the Instructor's Resource Website.
Videos for Java, Python, and C++ can be found at https://yongdanielliang.github.io/revelvideos.html.

Chapter 2 Elementary Programming



Please send suggestions and errata to Dr. Liang at y.daniel.liang@gmail.com. Indicate which book and edition you are using. Thanks!

Section 2.2 Writing a Simple Program

2.1 _____ is the code with natural language mixed with Java code.

- A. Java program
- B. A Java statement
- (•) C. Pseudocode
- D. A flowchart diagram

Your answer is correct

2.2 What is the exact output of the following code?

```
double area = 3.5;
System.out.print("area");
System.out.print(area);
```

- A. 3.53.5
- B. 3.5 3.5
- (•) C. area3.5
- D. area 3.5

Your answer is correct
Explanation: The first print statement prints a string followed by the second print statement that prints a number.

Section 2.3 Reading Input from the Console

2.3 Suppose a Scanner object is created as follows, what method do you use to read a real number?

```
Scanner input = new Scanner(System.in);
```

- (•) A. input.nextDouble();
- B. input.nextdouble();
- C. input.double();
- D. input.Double();

Your answer is correct
Explanation: The correct method to read a real number is nextDouble().

2.4 The following code fragment reads in two numbers:

```
Scanner input = new Scanner(System.in);
int i = input.nextInt();
double d = input.nextDouble();

What is the incorrect way to enter these two numbers?
```

- A. Enter an integer, a space, a double value, and then the Enter key.
- B. Enter an integer, two spaces, a double value, and then the Enter key.
- C. Enter an integer, an Enter key, a double value, and then the Enter key.
- (•) D. Enter a numeric value with a decimal point, a space, an integer, and then the Enter key.

Your answer is correct

2.5 If you enter 1 2 3, when you run this program, what will be the output?

```
import java.util.Scanner;

public class Test1 {
  public static void main(String[] args) {
    Scanner input = new Scanner(System.in);
    System.out.print("Enter three numbers: ");
    double number1 = input.nextDouble();
    double number2 = input.nextDouble();
    double number3 = input.nextDouble();

    // Compute average
    double average = (number1 + number2 + number3) / 3;

    // Display result
    System.out.println(average);
  }
}
```

- ○ A. 1.0
- ◉ B. 2.0
- ○ C. 3.0
- ○ D. 4.0

Your answer is correct
Explanation: (1.0 + 2.0 + 3.0) / 3 is 2.0

Section 2.4 Identifiers

2.6 Every letter in a Java keyword is in lowercase?

- ◉ A. true
- ○ B. false

Your answer is correct
Explanation: It is true that the keywords in Java are in lowercase. For example, public, static, int, double, and void are the keywords.

2.7 Which of the following is a valid identifier?

- ☑ A. $343
- ☐ B. class
- ☐ C. 9X
- ☐ D. 8+9
- ☑ E. radius

Your answer is correct
Explanation: class is a keyword, which cannot be used as an identifier. Identifiers cannot start with a number.

Section 2.5 Variables

2.8 Which of the following are correct names for variables according to Java naming conventions?

- ☑ A. radius
- ☐ B. Radius
- ☐ C. RADIUS
- ☑ D. findArea
- ☐ E. FindArea

Your answer is correct
Explanation: A single-word variable is in lowercase. In a multiple-word variable, the words are concatenated with the first word in lowercase and the first letter of each subsequent word in uppercase.

2.9 Which of the following are correct ways to declare variables?

- ☑ A. int length; int width;
- ☑ B. int length, width;
- ☐ C. int length; width;
- ☐ D. int length, int width;

Your answer is correct
Explanation: Note that a semicolon ends a statement. In B, length and width are both declared as int.

Section 2.6 Assignment Statements and Assignment Expressions

2.10 _____ is the Java assignment operator.

- ○ A. ==
- ○ B. :=
- ◉ C. =
- ○ D. =:

Your answer is correct

2.11 To assign a value 1 to variable x, you write

- ○ A. 1 = x;
- ◉ B. x = 1;
- ○ C. x := 1;
- ○ D. 1 := x;
- ○ E. x == 1;

Your answer is correct

2.12 Which of the following assignment statements is incorrect?

- ☐ A. i = j = k = 1;
- ☐ B. i = 1; j = 1; k = 1;
- ☑ C. i = 1 = j = 1 = k = 1;
- ☑ D. i == j == k == 1;

Your answer is correct

Section 2.7 Named Constants

2.13 To declare a constant MAX_LENGTH inside a method with value 99.98, you write

- ○ A. final MAX_LENGTH = 99.98;
- ○ B. final float MAX_LENGTH = 99.98;
- ○ C. double MAX_LENGTH = 99.98;
- ◉ D. final double MAX_LENGTH = 99.98;

Your answer is correct

2.14 Which of the following is a constant, according to Java naming conventions?

- ☑ A. MAX_VALUE
- ☐ B. Test
- ☐ C. read
- ☐ D. ReadInt
- ☑ E. COUNT

Your answer is correct
Explanation: All letters in a constant are in uppercase. In a multiple-word constant, the words are connected using underscores.

2.15 To improve readability and maintainability, you should declare _____ instead of using literal values such as 3.14159.

- ○ A. variables
- ○ B. methods
- ◉ C. constants
- ○ D. classes

Your answer is correct
Explanation: A constant gives a literal a descriptive name and makes the code more readable.

Section 2.8 Naming Conventions

2.16 According to Java naming convention, which of the following names can be variables?

- ☐ A. FindArea
- ☑ B. findArea

- [x] C. totalLength
- [ ] D. TOTAL_LENGTH
- [ ] E. class

Your answer is correct 
Explanation: The first word in a variable is in lowercase. So B and C are correct.

Section 2.9 Numeric Data Types and Operations Section 2.9.1 Numeric Types

2.17 Which of these data types requires the most amount of memory?

- (•) A. long
- ( ) B. int
- ( ) C. short
- ( ) D. byte

Your answer is correct 
Explanation: long takes 8 bytes. int 4 bytes. short 2 bytes. byte 1 byte.

2.18 When assigning a literal to a variable of the byte type, if the literal is too large to be stored as a byte value, it _____.

- ( ) A. causes overflow
- ( ) B. causes underflow
- ( ) C. causes no error
- ( ) D. cannot happen in Java
- (•) E. receives a compile error

Your answer is correct 
Explanation: For example, byte b = 23232 will cause a compile error.

Section 2.9.3 Numeric Operators

2.19 What is the result of 45 / 4?

- ( ) A. 10
- (•) B. 11
- ( ) C. 11.25
- ( ) D. 12

Your answer is correct 
Explanation: 45 / 4 is an integer division, which results in 11

2.20 Which of the following expression results in a value 1?

- ( ) A. 2 % 1
- ( ) B. 15 % 4
- ( ) C. 25 % 5
- (•) D. 37 % 6

Your answer is correct 
Explanation: 2 % 1 is 0, 15 % 4 is 3, 25 % 5 is 0, and 37 % 6 is 1

2.21 25 % 1 is _____

- ( ) A. 1
- ( ) B. 2
- ( ) C. 3
- ( ) D. 4
- (•) E. 0

Your answer is correct 

2.22 -25 % 5 is _____

- ( ) A. 1
- ( ) B. 2
- ( ) C. 3
- ( ) D. 4
- (•) E. 0

Your answer is correct

2.23 24 % 5 is _____

- A. 1
- B. 2
- C. 3
- (•) D. 4
- E. 0

Your answer is correct

2.25 -24 % -5 is _____

- A. 3
- B. -3
- C. 4
- (•) D. -4
- E. 0

Your answer is correct

Section 2.9.4 Exponent Operations

2.26 How do you write 2.5 ^ 3.1 in Java?

- A. 2.5 * 3.1
- (•) B. Math.pow(2.5, 3.1)
- C. Math.pow(3.1, 2.5)
- D. 2.5 ** 3.1
- E. 3.1 ** 2.5

Your answer is correct

2.27 Math.pow(2, 3) returns _____.

- A. 9
- B. 8
- C. 9.0
- (•) D. 8.0

Your answer is correct
Explanation: It returns a double value 8.0.

2.28 Math.pow(4, 1 / 2) returns _____.

- A. 2
- B. 2.0
- C. 0
- (•) D. 1.0
- E. 1

Your answer is correct
Explanation: Note that 1 / 2 is 0.

2.29 Math.pow(4, 1.0 / 2) returns _____.

- A. 2
- (•) B. 2.0
- C. 0
- D. 1.0
- E. 1

Your answer is correct
Explanation: Note that the pow method returns a double value, not an integer.

2.30 The _____ method returns a raised to the power of b.

- A. Math.power(a, b)
- B. Math.exponent(a, b)

- (●) C. Math.pow(a, b)
- ( ) D. Math.pow(b, a)

Your answer is correct

Section 2.10 Numeric Literals

2.31 To declare an int variable number with initial value 2, you write

- ( ) A. int number = 2L;
- ( ) B. int number = 2l;
- (●) C. int number = 2;
- ( ) D. int number = 2.0;

Your answer is correct

2.32 Analyze the following code.

```
public class Test {
  public static void main(String[] args) {
    int month = 09;
    System.out.println("month is " + month);
  }
}
```

- ( ) A. The program displays month is 09.
- ( ) B. The program displays month is 9.
- ( ) C. The program displays month is 9.0.
- (●) D. The program has a syntax error, because 09 is an incorrect literal value.

Your answer is correct
Explanation: Any numeric literal with the prefix 0 is an octal value. But 9 is not an octal digit. An octal digit is 0, 1, 2, 3, 4, 5, 6, or 7.

2.33 Which of the following is incorrect?

- ( ) A. 1_2
- ( ) B. 0.4_56
- ( ) C. 1_200_229
- (●) D. _4544

Your answer is correct
Explanation: You can use the digit separator _ for integers or floating point numbers. The separator must be placed between the digits.

2.34 Which of the following are the same as 1545.534?

- [x] A. 1.545534e+3
- [x] B. 0.1545534e+4
- [x] C. 1545534.0e-3
- [x] D. 154553.4e-2

Your answer is correct

2.35 Which of the following is incorrect?

- ( ) A. int x = 9;
- ( ) B. long x = 9;
- (●) C. float x = 1.0;
- ( ) D. double x = 1.0;

Your answer is correct

Section 2.11 Evaluating Expressions and Operator Precedence

2.36 The expression 4 + 20 / (3 - 1) * 2 is evaluated to

- ( ) A. 4
- ( ) B. 20
- (●) C. 24
- ( ) D. 9
- ( ) E. 25

Your answer is correct

Section 2.12 Case Study: Displaying the Current Time

2.37 The System.currentTimeMillis() returns _____ .

- ○ A. the current time.
- ○ B. the current time in milliseconds.
- ○ C. the current time in milliseconds since midnight.
- ○ D. the current time in milliseconds since midnight, January 1, 1970.
- ◉ E. the current time in milliseconds since midnight, January 1, 1970 GMT (the Unix time).

Your answer is correct 

2.38 To obtain the current second, use _____.

- ○ A. System.currentTimeMillis() % 3600
- ○ B. System.currentTimeMillis() % 60
- ◉ C. System.currentTimeMillis() / 1000 % 60
- ○ D. System.currentTimeMillis() / 1000 / 60 % 60
- ○ E. System.currentTimeMillis() / 1000 / 60 / 60 % 24

Your answer is correct 

2.39 To obtain the current minute, use _____.

- ○ A. System.currentTimeMillis() % 3600
- ○ B. System.currentTimeMillis() % 60
- ○ C. System.currentTimeMillis() / 1000 % 60
- ◉ D. System.currentTimeMillis() / 1000 / 60 % 60
- ○ E. System.currentTimeMillis() / 1000 / 60 / 60 % 24

Your answer is correct 

2.40 To obtain the current hour in UTC, use _____.

- ○ A. System.currentTimeMillis() % 3600
- ○ B. System.currentTimeMillis() % 60
- ○ C. System.currentTimeMillis() / 1000 % 60
- ○ D. System.currentTimeMillis() / 1000 / 60 % 60
- ◉ E. System.currentTimeMillis() / 1000 / 60 / 60 % 24

Your answer is correct 

Section 2.13 Augmented Assignment Operators

2.41 To add a value 1 to variable x, you write

- ☐ A. 1 + x = x;
- ☑ B. x += 1;
- ☐ C. x := 1;
- ☑ D. x = x + 1;
- ☑ E. x = 1 + x;

Your answer is correct 

2.42 To add number to sum, you write (Note: Java is case-sensitive)

- ☐ A. number += sum;
- ☐ B. number = sum + number;
- ☐ C. sum = Number + sum;
- ☑ D. sum += number;
- ☑ E. sum = sum + number;

Your answer is correct 

2.43 Suppose x is 1. What is x after x += 2?

- ○ A. 0
- ○ B. 1
- ○ C. 2
- ◉ D. 3
- ○ E. 4

Your answer is correct

2.44 Suppose x is 1. What is x after x -= 1?

- (●) A. 0
- ( ) B. 1
- ( ) C. 2
- ( ) D. -1
- ( ) E. -2

Your answer is correct

2.45 What is x after the following statements?

```
int x = 2;
int y = 1;
x *= y + 1;
```

- ( ) A. x is 1.
- ( ) B. x is 2.
- ( ) C. x is 3.
- (●) D. x is 4.

Your answer is correct
Explanation: (y + 1) is executed first and its result is multiplied with x and assigned to x.

2.46 What is x after the following statements?

```
int x = 1;
x *= x + 1;
```

- ( ) A. x is 1.
- (●) B. x is 2.
- ( ) C. x is 3.
- ( ) D. x is 4.

Your answer is correct

2.47 Which of the following statements are the same?

```
(A) x -= x + 4
(B) x = x + 4 - x
(C) x = x - (x + 4)
```

- ( ) A. (A) and (B) are the same
- (●) B. (A) and (C) are the same
- ( ) C. (B) and (C) are the same
- ( ) D. (A), (B), and (C) are the same

Your answer is correct

Section 2.14 Increment and Decrement Operators

2.48 Are the following four statements equivalent?

```
number += 1;
number = number + 1;
number++;
++number;
```

- (●) A. Yes
- ( ) B. No

Your answer is correct

2.49 What is i printed?

```
public class Test {
  public static void main(String[] args) {
    int j = 0;
    int i = ++j + j * 5;

    System.out.println("What is i? " + i);
  }
}
```

A. 0
B. 1
C. 5
D. 6

Your answer is correct 
Explanation: Operands are evaluated from left to right in Java. The left-hand operand of a binary operator is evaluated before any part of the right-hand operand is evaluated. This rule takes precedence over any other rules that govern expressions. Therefore, ++j is evaluated first, and j is now 1. Then j * 5 is evaluated, returns 5. So, i is 6.

2.50 What is i printed in the following code?

```
public class Test {
  public static void main(String[] args) {
    int j = 0;
    int i = j++ + j * 5;

    System.out.println("What is i? " + i);
  }
}
```

A. 0
B. 1
C. 5
D. 6

Your answer is correct 
Explanation: Operands are evaluated from left to right in Java. The left-hand operand of a binary operator is evaluated before any part of the right-hand operand is evaluated. This rule takes precedence over any other rules that govern expressions. Therefore, j++ is evaluated first. j is now 1. Since j++ is postincrement, the old value of j is returned for j++. So j++ + j * 5 equals 0 + 1 * 5. So, the result is 5.

2.51 What is y displayed in the following code?

```
public class Test {
  public static void main(String[] args) {
    int x = 1;
    int y = x++ + x;
    System.out.println("y is " + y);
  }
}
```

A. y is 1.
B. y is 2.
C. y is 3.
D. y is 4.

Your answer is correct 
Explanation: When evaluating x++ + x, x++ is evaluated first, which does two things: 1. returns 1 since it is post-increment. x becomes 2. Therefore y is 1 + 2.

2.52 What is y displayed?

```
public class Test {
  public static void main(String[] args) {
    int x = 1;
    int y = x + x++;
    System.out.println("y is " + y);
  }
}
```

A. y is 1.
B. y is 2.
C. y is 3.
D. y is 4.

Your answer is correct 
Explanation: When evaluating x + x++, x is evaluated first, which is 1. X++ returns 1 since it is post-increment and 2. Therefore y is 1 + 1.

Section 2.15 Numeric Type Conversions

2.53 To assign a double variable d to a float variable x, you write

A. x = (long)d
B. x = (int)d;
C. x = d;
D. x = (float)d;

Your answer is correct

2.54 Which of the following expressions will yield 0.5?

- [ ] A. 1 / 2
- [x] B. 1.0 / 2
- [ ] C. (double) (1 / 2)
- [x] D. (double) 1 / 2
- [x] E. 1 / 2.0

Your answer is correct
Explanation: 1 / 2 is an integer division, which results in 0.

2.55 What is the output of the following code:

```
double x = 5.5;
int y = (int)x;
System.out.println("x is " + x + " and y is " + y);
```

- ( ) A. x is 5 and y is 6
- ( ) B. x is 6.0 and y is 6.0
- ( ) C. x is 6 and y is 6
- (•) D. x is 5.5 and y is 5
- ( ) E. x is 5.5 and y is 5.0

Your answer is correct
Explanation: The value is x is not changed after the casting.

2.56 Which of the following assignment statements is illegal?

- [ ] A. float f = -34;
- [ ] B. int t = 23;
- [ ] C. short s = 10;
- [x] D. int t = (int)false;
- [x] E. int t = 4.5;

Your answer is correct

2.57 What is the value of (double)5/2?

- ( ) A. 2
- (•) B. 2.5
- ( ) C. 3
- ( ) D. 2.0
- ( ) E. 3.0

Your answer is correct

2.58 What is the value of (double)(5/2)?

- ( ) A. 2
- ( ) B. 2.5
- ( ) C. 3
- (•) D. 2.0
- ( ) E. 3.0

Your answer is correct

2.59 Which of the following expression results in 45.37?

- ( ) A. (int)(45.378 * 100) / 100
- (•) B. (int)(45.378 * 100) / 100.0
- ( ) C. (int)(45.378 * 100 / 100)
- ( ) D. (int)(45.378) * 100 / 100.0

Your answer is correct

2.60 The expression (int)(76.0252175 * 100) / 100 evaluates to _____.

- ( ) A. 76.02

- (●) B. 76
- ( ) C. 76.0252175
- ( ) D. 76.03

Your answer is correct 

Explanation: In order to obtain 76.02, you have divide 100.0.

2.61 If you attempt to add an int, a byte, a long, and a double, the result will be a(n) _____ value.

- ( ) A. byte
- ( ) B. int
- ( ) C. long
- (●) D. double

Your answer is correct 

Section 2.16 Software Life Cycle

2.62 _____ is a formal process that seeks to understand the problem and document in detail what the software system needs to do.

- (●) A. Requirements specification
- ( ) B. Analysis
- ( ) C. Design
- ( ) D. Implementation
- ( ) E. Testing

Your answer is correct 

2.63 _____ seeks to analyze the data flow and to identify the system?s input and output. When you do analysis, it helps to identify what the output is first, and then figure out what input data you need in order to produce the output.

- ( ) A. Requirements specification
- (●) B. Analysis
- ( ) C. Design
- ( ) D. Implementation
- ( ) E. Testing

Your answer is correct 

Section 2.18 Common Errors and Pitfalls

2.64 Analyze the following code:

```
public class Test {
  public static void main(String[] args) {
    int n = 10000 * 10000 * 10000;
    System.out.println("n is " + n);
  }
}
```

- ( ) A. The program displays n is 1000000000000.
- ( ) B. The result of 10000 * 10000 * 10000 is too large to be stored in an int variable n. This causes an overflow and the program is aborted.
- (●) C. The result of 10000 * 10000 * 10000 is too large to be stored in an int variable n. This causes an overflow and the program continues to execute because Java does not report errors on overflow.
- ( ) D. The result of 10000 * 10000 * 10000 is too large to be stored in an int variable n. This causes an underflow and the program is aborted.
- ( ) E. The result of 10000 * 10000 * 10000 is too large to be stored in an int variable n. This causes an underflow and the program continues to execute because Java does not report errors on underflow.

Your answer is correct