

Chapter 2 Elementary Programming

Section 2.3 Reading Input from the Console

1. Suppose a Scanner object is created as follows:

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

What method do you use to read an int value?

- a. `input.nextInt();`
- b. `input.nextInteger();`
- c. `input.int();`
- d. `input.integer();`

Key:a

#

2. The following code fragment reads in two numbers:

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

What are the correct ways 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.

Key:abc

#

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

- a. Java program
- b. A Java statement
- c. Pseudocode
- d. A flowchart diagram

key:c

#

3. 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: ");
    }
}
```

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```
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

Key:b

#

4. 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

Key:c

#

Section 2.4 Identifiers

4. Every letter in a Java keyword is in lowercase?

- a. true
- b. false

Key:a

#

5. Which of the following is a valid identifier?

- a. \$343
- b. class
- c. 9X
- d. 8+9
- e. radius

Key:ae

#

Section 2.5 Variables

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

- a. radius
- b. Radius
- c. RADIUS
- d. findArea
- e. FindArea

Key:ad

#

7. 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;

Key:ab

#

Section 2.6 Assignment Statements and Assignment Expressions

8. _____ is the Java assignment operator.

- a. ==
- b. :=
- c. =
- d. =:

Key:c

#

9. 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;

Key:b

#

10. 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;

Key:cd

#

Section 2.7 Named Constants

11. 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;

Key:d

#

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

- a. MAX_VALUE
- b. Test
- c. read
- d. ReadInt
- e. COUNT

Key:ae

#

13. 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

Key:c

#

Section 2.8 Naming Conventions

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

- a. FindArea
- b. findArea
- c. totalLength
- d. TOTAL_LENGTH
- e. class

Key:bc

#

Section 2.9 Numeric Data Types and Operations

14. Which of these data types requires the most amount of memory?

- a. long
- b. int
- c. short
- d. byte

Key:a

#

34. If a number is too large to be stored in a variable of the float type, it _____.

- a. causes overflow
- b. causes underflow

- c. causes no error
- d. cannot happen in Java

Key:a

#

15. 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.

Key:c

#

16. What is the result of 45 / 4?

- a. 10
- b. 11
- c. 11.25
- d. 12

Key:b 45 / 4 is an integer division, which results in 11

#

18. Which of the following expression results in a value 1?

- a. 2 % 1
- b. 15 % 4
- c. 25 % 5
- d. 37 % 6

Key:d 2 % 1 is 0, 15 % 4 is 3, 25 % 5 is 0, and 37 % 6 is 1

#

19. 25 % 1 is ____

- a. 1
- b. 2
- c. 3
- d. 4

e. 0
Key:e

20. -25 % 5 is ____
a. 1
b. 2
c. 3
d. 4
e. 0
Key:e

21. 24 % 5 is ____
a. 1
b. 2
c. 3
d. 4
e. 0
Key:d

22. -24 % 5 is ____
a. -1
b. -2
c. -3
d. -4
e. 0
Key:d

23. -24 % -5 is ____
a. 3
b. -3
c. 4
d. -4
e. 0
Key:d

30. Math.pow(2, 3) returns _____.
a. 9
b. 8
c. 9.0
d. 8.0
Key:d It returns a double value 8.0.

#

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

- a. 2
- b. 2.0
- c. 0
- d. 1.0
- e. 1

Key:d Note that `1 / 2` is 0.

#

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

- a. 2
- b. 2.0
- c. 0
- d. 1.0
- e. 1

Key:b Note that the `pow` method returns a double value, not an integer.

#

31. 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)`

Key:c

#

Section 2.10 Numeric Literals

15. 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;`

Key:c

#

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.

Key:d 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.

#

15. Which of the following are the same as 1545.534?

- a. 1.545534e+3
- b. 0.1545534e+4
- c. 1545534.0e-3
- d. 154553.4e-2

Key:abcd

#

Section 2.11 Evaluating Expressions and Operator Precedence

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

- a. 4
- b. 20
- c. 24
- d. 9
- e. 25

Key:c

#

Section 2.12 Case Study: Displaying the Current Time

58. 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).

Key:e

#

24. 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`

Key:c

#

24. 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`

Key:d

#

24. 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`

Key:e

#

Section 2.13 Augmented Assignment Operators

24. 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;`

Key:bde

#

25. 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;`

Key:de

#

26. Suppose x is 1. What is x after `x += 2`?
a. 0
b. 1
c. 2
d. 3
e. 4

Key:d

#

27. Suppose x is 1. What is x after `x -= 1`?
a. 0
b. 1
c. 2
d. -1
e. -2

Key:a

#

28. 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.

Key:d

#

29. 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.

Key:b

#

29. 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

Key:a

#

Section 2.14 Increment and Decrement Operators

21. Are the following four statements equivalent?

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

- a. Yes
- b. No

Key:a

#

34. 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

Key:d 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 returns 1. Then j*5 is evaluated, returns 5.

#

35. 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

Key:c Same as before, except that j++ evaluates to 0.

#

36. 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.

Key:c 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 $1 + 2$.

#

37. 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.

Key:b 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

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

a. $x = (\text{long})d$

b. $x = (\text{int})d$;

c. $x = d$;

d. $x = (\text{float})d$;

Key:d

#

17. Which of the following expressions will yield 0.5?

a. $1 / 2$

b. $1.0 / 2$

c. $(\text{double}) (1 / 2)$

d. $(\text{double}) 1 / 2$

e. $1 / 2.0$

Key:bde $1 / 2$ is an integer division, which results in 0.

#

39. What is the printout 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

Key:d The value of x is not changed after the casting.

#

40. Which of the following assignment statements is illegal?

- a. float f = -34;
- b. int t = 23;
- c. short s = 10;
- d. int t = (int>false;
- e. int t = 4.5;

Key:de

#

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

- a. 2
- b. 2.5
- c. 3
- d. 2.0
- e. 3.0

Key:b

#

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

- a. 2
- b. 2.5
- c. 3
- d. 2.0
- e. 3.0

Key:d

#

43. 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

Key:b

#

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

- a. 76.02
- b. 76
- c. 76.0252175
- d. 76.03

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

#

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

- a. byte
- b. int
- c. long
- d. double

Key:d

#

Section 2.16 Software Life Cycle

1. _____ 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

Key:a

#

1. _____ System analysis 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

Key:b

#

0. Any assignment statement can be used as an assignment expression.

- a. true
- b. false

Key:a

#

1. You can define a constant twice in a block.

- a. true
- b. false

Key:b

#

44. _____ are valid Java identifiers.

- a. \$Java
- b. _RE4

c. 3ere
d. 4+4
e. int
Key:ab

2. You can define a variable twice in a block.
a. true
b. false
Key:b

3. The value of a variable can be changed.
a. true
b. false
Key:a

4. The result of an integer division is the integer part of the division; the fraction part is truncated.
a. true
b. false
Key:a

5. You can always assign a value of int type to a variable of long type without loss of information.
a. true
b. false
Key:a

6. You can always assign a value of long type to a variable of int type without loss of precision.
a. true
b. false
Key:b

13. A variable may be assigned a value only once in the program.
a. true
b. false
Key:b

14. You can change the value of a constant.
a. true
b. false

Key:b

#

2. To declare a constant PI, you write

- a. `final static PI = 3.14159;`
- b. `final float PI = 3.14159;`
- c. `static double PI = 3.14159;`
- d. `final double PI = 3.14159;`

Key:d

#

3. To declare an int variable x with initial value 200, you write

- a. `int x = 200L;`
- b. `int x = 200l;`
- c. `int x = 200;`
- d. `int x = 200.0;`

Key:c

#

4. To assign a double variable d to an int variable x, you write

- a. `x = (long)d`
- b. `x = (int)d;`
- c. `x = d;`
- d. `x = (float)d;`

Key:b

#

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

- a. `MAX_VALUE`
- b. `Test`
- c. `read`
- d. `ReadInt`

Key:a

#

9. Which of the following assignment statements is illegal?

- a. `float f = -34;`
- b. `int t = 23;`
- c. `short s = 10;`
- d. `float f = 34.0;`

Key:d

#

10. A Java statement ends with a _____.

- a. comma (,)
- b. semicolon (;)
- c. period (.)
- d. closing brace

Key:b

#

11. The assignment operator in Java is _____.

- a. :=
- b. =
- c. = =
- d. <-

Key:b

#

12. Which of these data types requires the least amount of memory?

- a. float
- b. double
- c. short
- d. byte

Key:d

#

13. Which of the following operators has the highest precedence?

- a. casting
- b. +
- c. *
- d. /

Key:a

#

17. If you attempt to add an int, a byte, a long, and a float, the result will be a _____ value.

- a. float
- b. int
- c. long
- d. double

Key:a

#

18. If a program compiles fine, but it terminates abnormally at runtime, then the program suffers _____.

- a. a syntax error
- b. a runtime error
- c. a logic error

Key:b

#

24. What is 1 % 2?

- a. 0
- b. 1
- c. 2

Key:b

#

26. What is the printout of the following code:

```
double x = 10.1;
int y = (int)x;
System.out.println("x is " + x + " and y is " + y);
```

- a. x is 10 and y is 10
- b. x is 10.0 and y is 10.0
- c. x is 11 and y is 11
- d. x is 10.1 and y is 10
- e. x is 10.1 and y is 10.0

Key:d

#

32. The compiler checks _____.

- a. syntax errors
- b. logical errors
- c. runtime errors

Key:a

#

33. You can cast a double value to _____.

- a. byte
- b. short
- c. int
- d. long
- e. float

Key:abcde

#

34. The keyword _____ must be used to declare a constant.

- a. const
- b. final
- c. static
- d. double
- e. int

Key:b

#

37. pow is a method in the _____ class.

- a. Integer
- b. Double
- c. Math
- d. System

Key:c

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#

38. currentTimeMills is a method in the _____ class.

- a. Integer
- b. Double
- c. Math
- d. System

Key:d

#

39. $5 \% 1$ is _____

- a. 1
- b. 2
- c. 3
- d. 4
- e. 0

Key:e

#

40. $5 \% 2$ is _____

- a. 1
- b. 2
- c. 3
- d. 4
- e. 0

Key:a

#

41. $5 \% 3$ is _____

- a. 1
- b. 2
- c. 3
- d. 4
- e. 0

Key:b

#

42. $5 \% 4$ is _____

- a. 1
- b. 2
- c. 3
- d. 4
- e. 0

Key:a

#

43. $5 \% 5$ is _____

- a. 1

- b. 2
- c. 3
- d. 4
- e. 0

Key:e

#

43. -5 % 5 is _____

- a. -1
- b. -2
- c. -3
- d. -4
- e. 0

Key:e

#

43. -15 % 4 is _____

- a. -1
- b. -2
- c. -3
- d. -4
- e. 0

Key:c

#

43. -15 % -4 is _____

- a. -1
- b. -2
- c. -3
- d. -4
- e. 0

Key:c

#

43. A variable must be declared before it can be used.

- a. True
- b. False

Key:a

#

43. A constant can be defined using using the final keyword.

- a. True
- b. False

Key:a

#

43. Which of the following are not valid assignment statements?

- a. x = 55;

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b. $x = 56 + y$;

c. $55 = x$;

d. $x += 3$;

Key:c

Sample Final Exam for CSCI 1302

FINAL EXAM AND COURSE OUTCOMES MATCHING

COURSE OUTCOMES

Upon successful completion of this course, students should be able to

1. understand OO concepts: encapsulation, inheritance, polymorphism, interfaces, abstract classes
2. use Unified Modeling Language for design, analysis, and documentation
3. develop graphical user interfaces
4. develop event-driven programs
5. use file I/O and handle exceptions
6. design and implement OO programs

Here is a mapping of the final comprehensive exam against the course outcomes:

Question	Matches outcomes
1	1
2	2
3	3, 4, 5
4	6, 7
5	1, 2, 3, 4, 5, 6, 7

Name: _____ Covers chs8-19 Final Exam	CSCI 1302 Introduction to Programming Armstrong Atlantic State University Instructor: Dr. Y. Daniel Liang
---	---

Please note that the university policy prohibits giving the exam score by email. If you need to know your final exam score, come to see me during my office hours next semester.

I pledge by honor that I will not discuss the contents of this exam with anyone.

Signed by _____ Date _____

1. Design and implement classes. (10 pts)

Design a class named Person and its two subclasses named Student and Employee. Make Faculty and Staff subclasses of Employee. A person has a name, address, phone number, and email address. A student has a class status (freshman, sophomore, junior, or senior). Define the status as a constant. An employee has an office, salary, and date hired. Define a class named MyDate that contains the fields year, month, and day. A faculty member has office hours and a rank. A staff member has a title. Override the toString method in each class to display the class name and the person's name.

Draw the UML diagram for the classes. Write the code for the Student class only.

2. Design and use interfaces (10 pts)

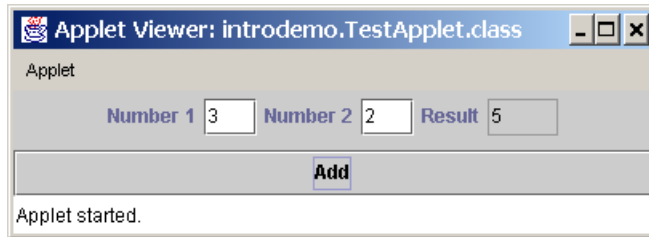
Write a class named Octagon that extends GeometricObject and implements the Comparable and Cloneable interfaces. Assume that all eight sides of the octagon are of equal size. The area can be computed using the following formula:

$$area = (2 + 4/\sqrt{2}) * side * side$$

Draw the UML diagram that involves Octagon, GeometricObject, Comparable, and Cloneable.

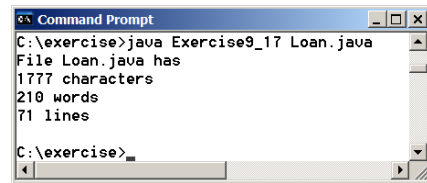
3. Design and create GUI applications (10 pts)

Write a Java applet to add two numbers from text fields, and displays the result in a non-editable text field. Enable your applet to run standalone with a main method. A sample run of the applet is shown in the following figure.



4. Text I/O (10 pts)

Write a program that will count the number of characters (excluding control characters `'\r'` and `'\n'`), words, and lines, in a file. Words are separated by spaces, tabs, carriage return, or line-feed characters. The file name should be passed as a command-line argument, as shown in the following sample run.



```
Command Prompt
C:\exercise>java Exercise9_17 Loan.java
File Loan.java has
1777 characters
210 words
71 lines
C:\exercise>
```

5. Multiple Choice Questions: (1 pts each)

(1. Mark your answers on the sheet. 2. Login and click Take Instructor Assigned Quiz for **QFinal**. 3. Submit it online within **5 mins**. 4. Close the Internet browser.)

1. _____ describes the state of an object.
- a. data fields
 - b. methods
 - c. constructors
 - d. none of the above

- #
2. An attribute that is shared by all objects of the class is coded using _____.
- a. an instance variable
 - b. a static variable
 - c. an instance method
 - d. a static method

- #
3. If a class named Student has no constructors defined explicitly, the following constructor is implicitly provided.
- a. `public Student()`
 - b. `protected Student()`
 - c. `private Student()`
 - d. `Student()`

- #
4. If a class named Student has a constructor `Student(String name)` defined explicitly, the following constructor is implicitly provided.
- a. `public Student()`
 - b. `protected Student()`
 - c. `private Student()`
 - d. `Student()`
 - e. None

- #
5. Suppose the `xMethod()` is invoked in the following constructor in a class, `xMethod()` is _____ in the class.

```
public MyClass() {  
    xMethod();  
}
```

- a. a static method
- b. an instance method
- c. a static method or an instance method

- #
6. Suppose the `xMethod()` is invoked from a main method in a class as follows, `xMethod()` is _____ in the class.

```
public static void main(String[] args) {
```

```
        xMethod();  
    }
```

- a. a static method
- b. an instance method
- c. a static or an instance method

#

7. What would be the result of attempting to compile and run the following code?

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

- a. The output "Value is 0" is printed.
- b. An "illegal array declaration syntax" compiler error occurs.
- c. A "possible reference before assignment" compiler error occurs.
- d. A runtime error occurs, because x is not initialized.

#

8. Analyze the following code:

```
public class Test {  
    private int t;  
  
    public static void main(String[] args) {  
        Test test = new Test();  
        System.out.println(test.t);  
    }  
}
```

- a. The variable t is not initialized and therefore causes errors.
- b. The variable t is private and therefore cannot be accessed in the main method.
- c. Since t is an instance variable, it cannot appear in the static main method.
- d. The program compiles and runs fine.

#

9. Suppose s is a string with the value "java". What will be assigned to x if you execute the following code?

```
char x = s.charAt(4);
```

- a. 'a'
- b. 'v'
- c. Nothing will be assigned to x, because the execution causes the runtime error `StringIndexOutOfBoundsException`.
- d. None of the above.

#

10. What is the printout for the following code?

```
class Test {
```

```

public static void main(String[] args) {
    int[] x = new int[3];
    System.out.println("x[0] is "+x[0]);
}
}

```

- a. The program has a syntax error because the size of the array wasn't specified when declaring the array.
- b. The program has a runtime error because the array elements are not initialized.
- c. The program runs fine and displays x[0] is 0.
- d. None of the above.

#

11. How can you get the word "abc" in the main method from the following call?

```
java Test "+" 3 "abc" 2
```

- a. args[0]
- b. args[1]
- c. args[2]
- d. args[3]

#

12. Which code fragment would correctly identify the number of arguments passed via the command line to a Java application, excluding the name of the class that is being invoked?
- a. `int count = args.length;`
 - b. `int count = args.length - 1;`
 - c. `int count = 0; while (args[count] != null) count ++;`
 - d. `int count=0; while (!(args[count].equals(""))) count ++;`

#

13. Show the output of running the class Test in the following code lines:

```

interface A {
    void print();
}

class C {}

class B extends C implements A {
    public void print() { }
}

class Test {
    public static void main(String[] args) {
        B b = new B();
        if (b instanceof A)
            System.out.println("b is an instance of A");
        if (b instanceof C)
            System.out.println("b is an instance of C");
    }
}

```

- a. Nothing.
- b. b is an instance of A.
- c. b is an instance of C.
- d. b is an instance of A followed by b is an instance of C.

#

14. When you implement a method that is defined in a superclass, you _____ the original method.
- a. overload
 - b. override
 - c. copy
 - d. call

#

15. What modifier should you use on a variable so that it can only be referenced inside its defining class.
- a. public
 - b. private
 - c. protected
 - d. Use the default modifier.

#

16. What is the output of running class C?

```
class A {
    public A() {
        System.out.println(
            "The default constructor of A is invoked");
    }
}

class B extends A {
    public B() {
        System.out.println(
            "The default constructor of B is invoked");
    }
}

public class C {
    public static void main(String[] args) {
        B b = new B();
    }
}
```

- a. none
- b. "The default constructor of B is invoked"
- c. "The default constructor of A is invoked" followed by "The default constructor of B is invoked"
- d. "The default constructor of A is invoked"

#

17. Analyze the following program.

```
class Test {
```

```

public static void main(String[] args) {
    try {
        String s = "5.6";
        Integer.parseInt(s); // Cause a NumberFormatException

        int i = 0;
        int y = 2 / i;
        System.out.println("Welcome to Java");
    }
    catch (Exception ex) {
        System.out.println(ex);
    }
}

```

a. An exception is raised due to Integer.parseInt(s);
b. An exception is raised due to 2 / i;
c. The program has a compilation error.
d. The program compiles and runs without exceptions.

18. What is displayed on the console when running the following program?

```

class Test {
    public static void main(String[] args) {
        try {
            System.out.println("Welcome to Java");
            int i = 0;
            int y = 2/i;
            System.out.println("Welcome to Java");
        }
        catch (RuntimeException ex) {
            System.out.println("Welcome to Java");
        }
        finally {
            System.out.println("End of the block");
        }
    }
}

```

a. The program displays Welcome to Java three times followed by End of the block.
b. The program displays Welcome to Java two times followed by End of the block.
c. The program displays Welcome to Java three times.
d. The program displays Welcome to Java two times.

19. To append data to an existing file, use _____ to construct a FileOutputStream for file out.dat.
a. new FileOutputStream("out.dat")
b. new FileOutputStream("out.dat", false)
c. new FileOutputStream("out.dat", true)
d. new FileOutputStream(true, "out.dat")

#

20. After the following program is finished, how many bytes are written to the file t.dat?

```
import java.io.*;
```

```
public class Test {  
    public static void main(String[] args) throws IOException {  
        DataOutputStream output = new DataOutputStream(  
            new FileOutputStream("t.dat"));  
        output.writeShort(1234);  
        output.writeShort(5678);  
        output.close();  
    }  
}
```

- a. 2 bytes.
- b. 4 bytes.
- c. 8 bytes.
- d. 16 bytes.

Have you submitted your answer to LiveLib? _____