Introduction to Java Programming, Includes Data Structures, Eleventh Edition, Y. Daniel Liang

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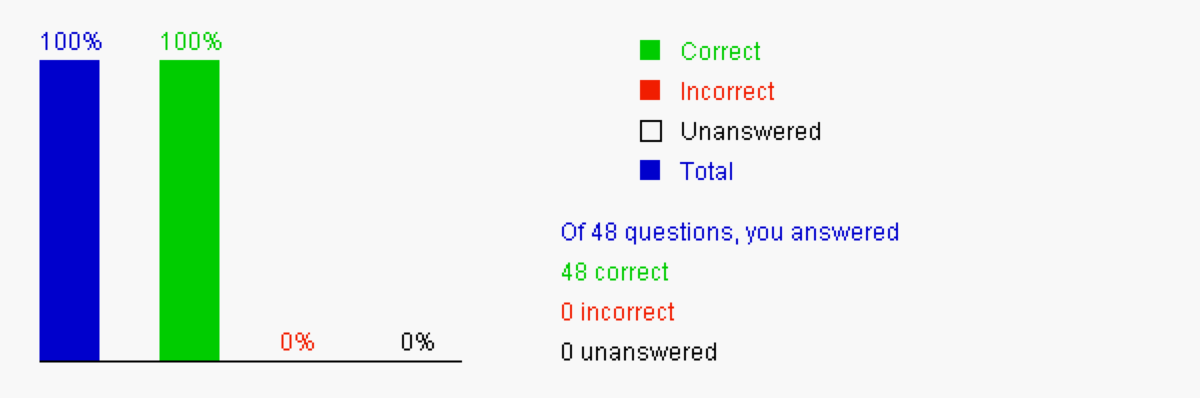
Chapter 12 Exception Handling and Text I/O



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Section 12.3 Exception Types

12.1 A Java exception is an instance of __________.

○ A. RuntimeException
○ B. Exception
○ C. Error
● D. Throwable
○ E. NumberFormatException

Your answer is correct ✓

12.2 An instance of _________ describes system errors. If this type of error occurs, there is little you can do beyond notifying the user and trying to terminate the program gracefully.

○ A. RuntimeException
○ B. Exception
● C. Error
○ D. Throwable
○ E. NumberFormatException

Your answer is correct ✓

12.3 An instance of _________ describes the errors caused by your program and external circumstances. These errors can be caught and handled by your program.

○ A. RuntimeException
● B. Exception
○ C. Error
○ D. Throwable
○ E. NumberFormatException

Your answer is correct ✓

12.4 An instance of _________ describes programming errors, such as bad casting, accessing an out-of-bounds array, and numeric errors.

● A. RuntimeException
○ B. Exception
○ C. Error
○ D. Throwable
○ E. NumberFormatException

Your answer is correct ✓

12.5 The following code causes Java to throw _________.

```java
int number = Integer.MAX_VALUE + 1;
```

○ A. RuntimeException
○ B. Exception
○ C. Error

○ D. Throwable

● E. no exceptions

Your answer is correct ✓

Explanation: At present, Java does not throw integer overflow exceptions. The future version of Java may fix this problem to throw an over flow exception.

12.6 Instances of _________ are unchecked exceptions.

☑ A. RuntimeException

☐ B. Exception

☑ C. Error

☐ D. Throwable

☑ E. NumberFormatException

Your answer is correct ✓

Explanation: NumberFormatException is a subclass of RuntimeException

12.7 What exception type does the following program throw?

```
public class Test {
  public static void main(String[] args) {
    System.out.println(1 / 0);
  }
}
```

● A. ArithmeticException

○ B. ArrayIndexOutOfBoundsException

○ C. StringIndexOutOfBoundsException

○ D. ClassCastException

○ E. No exception

Your answer is correct ✓

12.8 What exception type does the following program throw?

```
public class Test {
  public static void main(String[] args) {
    int[] list = new int[5];
    System.out.println(list[5]);
  }
}
```

○ A. ArithmeticException

● B. ArrayIndexOutOfBoundsException

○ C. StringIndexOutOfBoundsException

○ D. ClassCastException

○ E. No exception

Your answer is correct ✓

12.9 What exception type does the following program throw?

```
public class Test {
  public static void main(String[] args) {
    String s = "abc";
    System.out.println(s.charAt(3));
  }
}
```

○ A. ArithmeticException

○ B. ArrayIndexOutOfBoundsException

● C. StringIndexOutOfBoundsException

○ D. ClassCastException

○ E. No exception

Your answer is correct ✓

12.10 What exception type does the following program throw?

```
public class Test {
  public static void main(String[] args) {
    Object o = new Object();
    String d = (String)o;
  }
}
```

○ A. ArithmeticException

○ B. ArrayIndexOutOfBoundsException

○ C. StringIndexOutOfBoundsException

● D. ClassCastException

○ E. No exception

Your answer is correct ✓

12.11 What exception type does the following program throw?

```
public class Test {
  public static void main(String[] args) {
    Object o = null;
    System.out.println(o.toString());
  }
}
```

○ A. ArithmeticException

○ B. ArrayIndexOutOfBoundsException

○ C. StringIndexOutOfBoundsException

○ D. ClassCastException

● E. NullPointerException

Your answer is correct ✓

12.12 What exception type does the following program throw?

```
public class Test {
  public static void main(String[] args) {
    Object o = null;
    System.out.println(o);
  }
}
```

○ A. ArithmeticException

○ B. ArrayIndexOutOfBoundsException

○ C. StringIndexOutOfBoundsException

● D. No exception

○ E. NullPointerException

Your answer is correct ✓

Section 12.4 More on Exception Handling

12.13 A method must declare to throw ________.

○ A. unchecked exceptions

● B. checked exceptions

○ C. Error

○ D. RuntimeException

Your answer is correct ✓

12.14 Which of the following statements are true?

☑ A. You use the keyword throws to declare exceptions in the method heading.

☑ B. A method may declare to throw multiple exceptions.

☑ C. To throw an exception, use the key word throw.

☑ D. If a checked exception occurs in a method, it must be either caught or declared to be thrown from the method.

Your answer is correct ✓

12.15 Analyze the following code:

```
public class Test {
  public static void main(String[] args) throws MyException {
    System.out.println("Welcome to Java");
  }
}

class MyException extends Error {
}
```

● A. You should not declare a class that extends Error, because Error raises a fatal error that terminates the program.

○ B. You cannot declare an exception in the main method.

○ C. You declared an exception in the main method, but you did not throw it.

○ D. The program has a compile error.

Your answer is correct ✓

Explanation: When an exception of Error type occurs, your program would terminate. Therefore, you should not declare an exception that extends Error. You declared an exception in the main method. If you did not throw anything, that is fine.

12.16 Analyze the following code:

```
public 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;
    }
    catch (Exception ex) {
      System.out.println("NumberFormatException");
    }
    catch (RuntimeException ex) {
      System.out.println("RuntimeException");
    }
  }
}
```

○ A. The program displays NumberFormatException.

○ B. The program displays RuntimeException.

○ C. The program displays NumberFormatException followed by RuntimeException.

● D. The program has a compile error.

Your answer is correct ✓

Explanation: catch (RuntimeException ex) should be specified before catch (Exception ex).

12.17 Analyze the following program.

```
public 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 compile error.

○ D. The program compiles and runs without exceptions.

Your answer is correct ✓

Explanation: Both (A) and (B) would cause exception, but (A) occurred first, so the exception is due to (A).

12.18 What is displayed on the console when running the following program?

```
public class Test {
  public static void main(String[] args) {
    try {
      p();
      System.out.println("After the method call");
    }
    catch (NumberFormatException ex) {
      System.out.println("NumberFormatException");
    }
    catch (RuntimeException ex) {
      System.out.println("RuntimeException");
    }
  }

  static void p() {
    String s = "5.6";
    Integer.parseInt(s); // Cause a NumberFormatException

    int i = 0;
    int y = 2 / i;
    System.out.println("Welcome to Java");
  }
}
```

● A. The program displays NumberFormatException.
○ B. The program displays NumberFormatException followed by After the method call.
○ C. The program displays NumberFormatException followed by RuntimeException.
○ D. The program has a compile error.
○ E. The program displays RuntimeException.

Your answer is correct ✓

Explanation: It should be A. The main method invokes the method p. In p, Integer.parseInt(s) causes a NumberFormatException. The method p is now terminated. The NumberFormatException exception is handled in the main method. So NumberFormatException is displayed.

12.19 What is displayed on the console when running the following program?

```
public class Test {
  public static void main(String[] args) {
    try {
      p();
      System.out.println("After the method call");
    }
    catch (RuntimeException ex) {
      System.out.println("RuntimeException");
    }
    catch (Exception ex) {
      System.out.println("Exception");
    }
  }

  static void p() throws Exception {
    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 (RuntimeException ex) {
      System.out.println("RuntimeException");
    }
    catch (Exception ex) {
      System.out.println("Exception");
    }
  }
}
```

○ A. The program displays RuntimeException twice.
○ B. The program displays Exception twice.
● C. The program displays RuntimeException followed by After the method call.
○ D. The program displays Exception followed by RuntimeException.
○ E. The program has a compile error.

Your answer is correct ✓

Section 12.5 The finally Clause

12.20 What is wrong in the following program?

```
public class Test {
  public static void main (String[] args) {
    try {
      System.out.println("Welcome to Java");
     }
  }
}
```

○ A. You cannot have a try block without a catch block.
● B. You cannot have a try block without a catch block or a finally block.
○ C. A method call that does not declare exceptions cannot be placed inside a try block.
○ D. Nothing is wrong.

Your answer is correct ✓

12.21 What is displayed on the console when running the following program?

```
public class Test {
  public static void main (String[] args) {
    try {
      System.out.println("Welcome to Java");
    }
    finally {
      System.out.println("The finally clause is executed");
    }
  }
}
```

○ A. Welcome to Java

● B. Welcome to Java followed by The finally clause is executed in the next line

○ C. The finally clause is executed

○ D. None of the above

Your answer is correct ✓

12.22 What is displayed on the console when running the following program?

```
public class Test {
  public static void main (String[] args) {
    try {
      System.out.println("Welcome to Java");
      return;
    }
    finally {
      System.out.println("The finally clause is executed");
    }
  }
}
```

○ A. Welcome to Java

● B. Welcome to Java followed by The finally clause is executed in the next line

○ C. The finally clause is executed

○ D. None of the above

Your answer is correct ✓

Explanation: The return statement exits the method, but before exiting the method, the finally clause is executed.

12.23 What is displayed on the console when running the following program?

```
public 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 HTML");
    }
    finally {
      System.out.println("The finally clause is executed");
    }
  }
}
```

○ A. Welcome to Java, then an error message.

● B. Welcome to Java followed by The finally clause is executed in the next line, then an error message.

○ C. The program displays three lines: Welcome to Java, Welcome to HTML, The finally clause is executed, then an error message.

○ D. None of the above.

Your answer is correct ✓

12.24 What is displayed on the console when running the following program?

```
public class Test {
  public static void main(String[] args) {
    try {
      System.out.println("Welcome to Java");
      int i = 0;
      double y = 2.0 / i;
      System.out.println("Welcome to HTML");
    }
    finally {
      System.out.println("The finally clause is executed");
    }
  }
}
```

○ A. Welcome to Java.

○ B. Welcome to Java followed by The finally clause is executed in the next line.

● C. The program displays three lines: Welcome to Java, Welcome to HTML, The finally clause is executed.

○ D. None of the above.

Your answer is correct ✓

Explanation: A floating number divided by 0 does not raise an exception.

12.25 What is displayed on the console when running the following program?

```
public 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.

Your answer is correct ✓

12.26 What is displayed on the console when running the following program?

```
public 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");
    }

    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 two times followed by End of the block two times.

○ D. You cannot catch RuntimeException errors.

Your answer is correct ✓

12.27 What is displayed on the console when running the following program?

```
public 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");
    }
    finally {
      System.out.println("End of the block");
    }

    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 two times followed by End of the block two times.

● D. The program displays Welcome to Java and End of the block, and then terminates because of an unhandled exception.

Your answer is correct ✓

Section 12.6 When to Use Exceptions

12.28 Which of the following is not an advantage of Java exception handling?

○ A. Java separates exception handling from normal processing tasks.

● B. Exception handling improves performance.

○ C. Exception handling makes it possible for the caller's caller to handle the exception.

○ D. Exception handling simplifies programming because the error-reporting and error-handling code can be placed at the catch block.

Your answer is correct ✓

12.29 Analyze the following code:

```
public class Test {
  public static void main(String[] args) {
    try {
      int zero = 0;
      int y = 2/zero;
      try {
        String s = "5.6";
        Integer.parseInt(s); // Cause a NumberFormatException
      }
      catch(Exception e) {
      }
    }
    catch(RuntimeException e) {
      System.out.println(e);
    }
  }
}
```

○ A. A try-catch block cannot be embedded inside another try-catch block.

● B. A good programming practice is to avoid nesting try-catch blocks, because nesting makes programs difficult to read. You can rewrite the program using only one try-catch block.

○ C. The program has a compile error because Exception appears before RuntimeException.

○ D. None of the above.

Your answer is correct ✓

Explanation: The best answer is b. This question does not ask you what happens when you run the program. If you run the program, a RuntimeException would occur and it would be caught be the last catch clause.

Section 12.7 Rethrowing Exceptions

12.30 What is displayed on the console when running the following program?

```
public class Test {
  public static void main(String[] args) {
    try {
      method();
      System.out.println("After the method call");
    }
    catch (RuntimeException ex) {
      System.out.println("RuntimeException");
    }
    catch (Exception ex) {
      System.out.println("Exception");
    }
  }

  static void method() throws Exception {
    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 (NumberFormatException ex) {
      System.out.println("NumberFormatException");
      throw ex;
    }
    catch (RuntimeException ex) {
      System.out.println("RuntimeException");
```

```
        }
      }
    }
```

○ A. The program displays NumberFormatException twice.
○ B. The program displays NumberFormatException followed by After the method call.
● C. The program displays NumberFormatException followed by RuntimeException.
○ D. The program has a compile error.

Your answer is correct ✓

Section 12.10 The File Class

12.31 What are the reasons to create an instance of the File class?

☑ A. To determine whether the file exists.
☑ B. To obtain the properties of the file such as whether the file can be read, written, or is hidden.
☑ C. To rename the file.
☑ D. To delete the file.
□ E. To read/write data from/to a file

Your answer is correct ✓

12.32 Which of the following is used to test if a file c:\temp\test.txt exists?

○ A. new File("c:\temp\test.txt").exists()
● B. new File("c:\\temp\\test.txt").exists()
○ C. new File("c:\temp\test.txt").exist()
○ D. new File("c:\\temp\\test.txt").exist()
○ E. None of the above.

Your answer is correct ✓

12.33 Which of the following statements creates an instance of File on Window for the file c:\temp.txt?

○ A. new File("c:\temp.txt")
● B. new File("c:\\temp.txt")
○ C. new File("c:/temp.txt")
○ D. new File("c://temp.txt")

Your answer is correct ✓

12.34 Which of the following statements are true?

○ A. If a file (e.g., c:\temp.txt) does not exist, new File("c:\\temp.txt") returns null.
○ B. If a directory (e.g., c:\liang) does not exist, new File("c:\liang") returns null.
○ C. If a file (e.g., c:\temp.txt) does not exist, new File("c:\\temp.txt") creates a new file named c:\temp.txt.
○ D. If a directory (e.g., c:\liang) does not exist, new File("c:\liang") creates a new directory named c:\liang.
● E. None of the above.

Your answer is correct ✓

Section 12.11 Text I/O

12.35 Which class contains the method for checking whether a file exists?

● A. File
○ B. PrintWriter
○ C. Scanner
○ D. System

Your answer is correct ✓

12.36 Which class do you use to write data into a text file?

○ A. File
● B. PrintWriter
○ C. Scanner
○ D. System

Your answer is correct ✓

12.37 Which class do you use to read data from a text file?

○ A. File

○ B. PrintWriter

● C. Scanner

○ D. System

Your answer is correct ✓

12.38 Which method can be used to write data?

○ A. close

● B. print

○ C. exist

○ D. rename

Your answer is correct ✓

12.39 Which method can be used to read a whole line from the file?

○ A. next

● B. nextLine

○ C. nextInt

○ D. nextDouble

Your answer is correct ✓

12.40 Which of the following statements are correct?

```
I:
try (PrintWriter output = new PrintWriter("output.txt");) {
  output.println("Welcome to Java");
}

II:
try (PrintWriter output = new PrintWriter("output.txt");
     Scanner input = new Scanner(System.in);) {
  output.println(input.nextLine());
}

III:
PrintWriter output;
try (output = new PrintWriter("output.txt");) {
  output.println("Welcome to Java");
}

IV:
try (PrintWriter output = new PrintWriter("output.txt");) {
  output.println("Welcome to Java");
}
finally {
  output.close();
}
```

☑ A. I

☑ B. II

□ C. III

□ D. IV

Your answer is correct ✓

Explanation: III is wrong. You have to declare the resource reference variable and create the resource altogether in the try (?).

12.41 Which of the following statements are correct?

```
I:
File file = new File("input.txt");
try (Scanner input = new Scanner(file);) {
  String line = input.nextLine();
}

II:
try (File file = new File("input.txt");
     Scanner input = new Scanner(file);) {
  String line = input.nextLine();
}

III:
File file;
try (file = new File("input.txt");
     Scanner input = new Scanner(file);) {
  String line = input.nextLine();
}

IV:
File file;
Scanner input;
try (file = new File("input.txt");
     input = new Scanner(file);) {
  String line = input.nextLine();
}
```

● A. I
○ B. II
○ C. III
○ D. IV

Your answer is correct ✓
Explanation: File is not a subtype of AutoCloseable. So it cannot be used to open a resource in a try-with-resources.

12.42 Which method can be used to create an input object for file temp.txt?

○ A. new Scanner("temp.txt")
○ B. new Scanner(temp.txt)
● C. new Scanner(new File("temp.txt"))
○ D. new Scanner(File("temp.txt"))

Your answer is correct ✓

12.43 Suppose you enter 34.3 57.8 789, then press the ENTER key. Analyze the following code.

```
Scanner input = new Scanner(System.in);
int v1 = input.nextInt();
int v2 = input.nextInt();
String line = input.nextLine();
```

○ A. After the last statement is executed, v1 is 34.
● B. The program has a runtime error because 34.3 is not an integer.
○ C. After the last statement is executed, line contains characters '7', '8', '9', '\n'.
○ D. After the last statement is executed, line contains characters '7', '8', '9'.

Your answer is correct ✓
Explanation: See discussions in Section 12.11.3.

12.44 Suppose you enter 34.3 57.8 789, then press the ENTER key. Analyze the following code.

```
Scanner input = new Scanner(System.in);
double v1 = input.nextDouble();
double v2 = input.nextDouble();
String line = input.nextLine();
```

○ A. After the last statement is executed, line contains characters '7', '8', '9'.
○ B. After the last statement is executed, line contains characters '7', '8', '9', '\n'.
○ C. After the last statement is executed, line contains characters ' ', '7', '8', '9', '\n'.
● D. After the last statement is executed, line contains characters ' ', '7', '8', '9'.

Your answer is correct ✓
Explanation: See discussions in Section 12.11.3.

12.45 Suppose you enter 34.3, the ENTER key, 57.8, the ENTER key. Analyze the following code.

```
Line 1  Scanner input = new Scanner(System.in);
Line 2  double v1 = input.nextDouble();
Line 3  double v2 = input.nextDouble();
Line 4  String line = input.nextLine();
```

☑ A. After line 2 is executed, v1 is 34.3.
☑ B. After line 3 is executed, v2 is 57.8.
☑ C. After line 4 is executed, line contains an empty string.
□ D. After line 4 is executed, line is null.
□ E. After line 4 is executed, line contains character "\n".

Your answer is correct ✓
Explanation: See discussions in Section 12.11.3.

12.46 Suppose you enter 34.3, the ENTER key, 57.8, the ENTER key, abc, the Enter key. Analyze the following code.

```
Line 1  Scanner input = new Scanner(System.in);
Line 2  double v1 = input.nextDouble();
Line 3  double v2 = input.nextDouble();
Line 4  String line = input.nextLine();
```

☑ A. After line 2 is executed, v1 is 34.3.

☑ B. After line 3 is executed, v2 is 57.8.

☑ C. After line 4 is executed, line contains an empty string.

☐ D. After line 4 is executed, line is null.

☐ E. After line 4 is executed, line contains character "abc".

Your answer is correct ✓

Explanation: See discussions in Section 12.11.3.

12.47 Which method can be used to create an output object for file temp.txt?

☑ A. new PrintWriter("temp.txt")

☐ B. new PrintWriter(temp.txt)

☑ C. new PrintWriter(new File("temp.txt"))

☐ D. new PrintWriter(File("temp.txt"))

Your answer is correct ✓

Section 12.12 Reading Data from the Web

12.48 To create an InputStream to read from a file on a Web server, you use the method __________ in the URL class.

○ A. getInputStream();

○ B. obtainInputStream();

● C. openStream();

○ D. connectStream();

Your answer is correct ✓