

Homework

The following homework is designed to cover the course objectives for this unit.

Assignment 1.1:

Research the ITT Tech Virtual Library to find out the types of objects that can be thrown to capture an exception. Present your findings in the form of a list. Cite your sources using Chicago Manual of Style format. Submit your written list with citations to your instructor at the beginning of Unit 2.

Assignment 1.2:

Research the ITT Tech Virtual Library to identify the difference between the throw statement and the throws clause. Present your findings in the form of a report comparing and listing the features of the throw statement and the throws clause.

Cite your sources using Chicago Manual of Style format. Submit your report to your instructor at the beginning of Unit 2. Your report should be 1 to 2 pages in length, double-spaced.

Assignment 1.3:

Answer the following 20 questions. Submit your written answers to your instructor at the beginning of Unit 2. **Note:** Some questions go across multiple pages; be sure to read the entire question and all answer options.

1. When you run the following code, what will be displayed on the console?

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

```

- The program will display RuntimeException twice.
 - The program will display Exception twice.
 - The program will display Exception followed by RuntimeException.
 - The program will display RuntimeException followed by after the method call.
 - The program will have a compilation error.
2. 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));
    }
}

```

- ArithmeticException
 - ClassCastException
 - ArrayIndexOutOfBoundsException
 - StringIndexOutOfBoundsException
 - No exception
3. An instance of _____ describes the errors caused by your program and external circumstances. These errors can be caught and handled by your program.
- RuntimeException
 - NumberFormatException
 - Exception
 - Throwable
 - Error
4. 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. ClassCastException
 - c. StringIndexOutOfBoundsException
 - d. ArrayIndexOutOfBoundsException
 - e. No exception
5. Which of the following is **not** a correct assertion statement?
- a. `assert sum > 10 && sum < 5 * 10 : "sum is " + sum;`
 - b. `assert "sum is " + sum;`
 - c. `assert (i > 10);`
 - d. None of the above
6. When you run the following program, will be displayed on the console?

```
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 (followed by) The finally clause is executed (on the next line)
 - b. Welcome to Java
 - c. The finally clause is executed
 - d. None of the above
7. When you run the following program, what will be displayed on the console?

```
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 (on the next line)
- c. The finally clause is executed

d. None of the above

8. When you run the following program, what will be displayed on the console?

```
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");
    }
}
```

- The program will display Welcome to Java two times followed by End of the block two times.
- The program will display Welcome to Java two times followed by End of the block.
- You cannot catch RuntimeException errors.
- The program will display Welcome to Java three times followed by End of the block.

9. When you run the following program, what will be displayed on the console?

```
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");
    }
}
}

```

- The program will have a compilation error.
- The program will display `NumberFormatException` twice.
- The program will display `NumberFormatException` followed by `RuntimeException`.
- The program will display `NumberFormatException` followed by After the method call.

10. What exception type will the following program throw?

```

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

```

- `StringIndexOutOfBoundsException`
- `NullPointerException`
- `ArrayIndexOutOfBoundsException`
- `ArithmeticException`
- `ClassCastException`

11. Analyze the following code:

```

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);
        }
    }
}

```

```
    }  
}
```

Which of the following statements is true?

- a. 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.
- b. The program has a compilation error because Exception appears before RuntimeException.
- c. A try-catch block cannot be embedded inside another try-catch block.
- d. None of the above.

12. The following code:

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

causes Java to throw _____.

- a. an error
 - b. an exception
 - c. no exceptions
 - d. a throwable
 - e. RuntimeException
13. 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. NumberFormatException
 - d. Throwable
 - e. Error
14. Which of the following statements are true? (Hint: There are multiple answers.)
- a. If a checked exception occurs in a method, it must be either caught or declared to be thrown from the method.
 - b. You use the keyword throws to declare exceptions in the method heading.
 - c. A method may declare to throw multiple exceptions.
 - d. To throw an exception, use the key word throw.

15. Which of the following statements is correct?

- a. Do not use assertions for argument checking in public methods.
- b. Exception handling addresses robustness whereas assertion addresses correctness.
- c. Use assertions to reaffirm assumptions.
- d. Exception handling deals with unusual circumstances during program execution. Assertions are intended to ensure the correctness of the program.
- e. All of the above.

16. When you run the following program, what will be displayed on the console?

```
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 will display Welcome to Java two times.
- b. The program will display Welcome to Java three times followed by End of the block.
- c. The program will display Welcome to Java two times followed by End of the block.
- d. The program will display Welcome to Java three times.

17. A method must declare to throw _____.

- a. checked exceptions
- b. unchecked exceptions
- c. Error
- d. RuntimeException

18. Analyze the following code:

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

class MyException extends Error {
}
```

Which of the following sentences is true?

- a. You cannot declare an exception in the main method.
- b. You should not declare a class that extends Error, because Error raises a fatal error that terminates the program.
- c. The program has a compilation error.
- d. You declared an exception in the main method, but you did not throw it.

19. Which of the following statements is correct to rethrow exception ex along with new information?

- a. `throw new Exception(ex, "New info");`
- b. `throw ex; throw new Exception("Some new info");`
- c. `throw new Exception("New info"); throw ex;`
- d. `throw new Exception("New info", ex);`

20. Analyze the following code:

```
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");
        }
    }
}
```

Which of the following sentences is true?

- a. The program will have a compilation error.

- b. The program will display `RuntimeException`.
- c. The program will display `NumberFormatException`.
- d. The program will display `NumberFormatException` followed by `RuntimeException`.