객체지향 프로그래밍 8주차 실습과제

이름 : 김태석
학번 : 201721083
학과 : 미디어학과
학년 : 2학년

1. 가)

-수행화면

```
At the tone, the time is Fri May 22 19:07:32 KST 2020
At the tone, the time is Fri May 22 19:07:32 KST 2020
At the tone, the time is Fri May 22 19:07:32 KST 2020
At the tone, the time is Fri May 22 19:07:32 KST 2020
At the tone, the time is Fri May 22 19:07:32 KST 2020
At the tone, the time is Fri May 22 19:07:32 KST 2020
At the tone, the time is Fri May 22 19:07:32 KST 2020
At the tone, the time is Fri May 22 19:07:32 KST 2020
At the tone, the time is Fri May 22 19:07:32 KST 2020
At the tone, the time is Fri May 22 19:07:32 KST 2020
At the tone, the time is Fri May 22 19:07:32 KST 2020
At the tone, the time is Fri May 22 19:07:32 KST 2020
At the tone, the time is Fri May 22 19:07:32 KST 2020
```

-코드

```java
public class Innerclass {
    static int interval;
    public static void main(String[] args) {
        var jabberer = new TalkingClock(1000,true);
        TalkingClock.TimePrinter listener = jabberer.new
TimePrinter();
        Timer t = new Timer(interval,listener);
        t.restart();
        JOptionPane.showMessageDialog(null,"Quit
Program?");
        System.exit(0);
    }
}
```

2. 가)

–수행화면

\<terminated\> AnonymousInnerClassTest [Java Application] /Library/Java/JavaV

```
At the tone, the time is Fri May 22 19:57:33 KST 2020
At the tone, the time is Fri May 22 19:57:34 KST 2020
At the tone, the time is Fri May 22 19:57:35 KST 2020
At the tone, the time is Fri May 22 19:57:36 KST 2020
At the tone, the time is Fri May 22 19:57:37 KST 2020
At the tone, the time is Fri May 22 19:57:38 KST 2020
At the tone, the time is Fri May 22 19:57:39 KST 2020
At the tone, the time is Fri May 22 19:57:40 KST 2020
```

-코드

```java
class TalkingClock{
public void start(int interval, final boolean beep)
{
        class TimePrinter implements ActionListener
        {
        public void actionPerformed(ActionEvent event) {
                Date now = new Date();
                System.out.println("At the tone, the time is " + now);
        if (beep) Toolkit.getDefaultToolkit().beep();
                    }
                }
        ActionListener listener = new TimePrinter();
        Timer t = new Timer(interval, listener);
        t.start();
        }
}
```

2.나)

-수행화면

```
At the tone, the time is Sat May 23 16:59:58 KST 2020
At the tone, the time is Sat May 23 16:59:59 KST 2020
At the tone, the time is Sat May 23 17:00:00 KST 2020
At the tone, the time is Sat May 23 17:00:01 KST 2020
At the tone, the time is Sat May 23 17:00:02 KST 2020
At the tone, the time is Sat May 23 17:00:03 KST 2020
At the tone, the time is Sat May 23 17:00:04 KST 2020
At the tone, the time is Sat May 23 17:00:05 KST 2020
At the tone, the time is Sat May 23 17:00:06 KST 2020
At the tone, the time is Sat May 23 17:00:07 KST 2020
At the tone, the time is Sat May 23 17:00:08 KST 2020
At the tone, the time is Sat May 23 17:00:09 KST 2020
```

–코드

```java
class TalkingClock{
     public void start(int interval, boolean beep)
{
     Timer t = new Timer(interval,event->
{System.out.println("At the tone, the time is " + new
Date());});
     if (beep) Toolkit.getDefaultToolkit().beep();
     t.start();
     }
}
```

3. 가)

–수행화면

<terminated> DivideByZeroNoExceptionHandling [Java Application] /Library/Java/JavaVirtualMachines/jdk-14.0.1.jdk/Contents/Home
Please enter an integer numerator: 100
Please enter an integer denominator: 0
Exception in thread "main" java.lang.ArithmeticException: / by zero
        at w8.DivideByZeroNoExceptionHandling.quotient(DivideByZeroNoExceptionHandling.java:9)
        at w8.DivideByZeroNoExceptionHandling.main(DivideByZeroNoExceptionHandling.java:21)

-설명 : 분모로 0이 올 수 없으므로 100 / 0은 성립 될 수 없어 에러가 난다.

3. 나)

-수행화면

<terminated> DivideByZeroNoExceptionHandling [Java Application] /Library/Java/JavaVirtualMachines/jdk-14.0.1.jdk/Contents/Home/bi
Please enter an integer numerator: 100
Please enter an integer denominator: hello
Exception in thread "main" java.util.InputMismatchException
        at java.base/java.util.Scanner.throwFor(Scanner.java:939)
        at java.base/java.util.Scanner.next(Scanner.java:1594)
        at java.base/java.util.Scanner.nextInt(Scanner.java:2258)
        at java.base/java.util.Scanner.nextInt(Scanner.java:2212)
        at w8.DivideByZeroNoExceptionHandling.main(DivideByZeroNoExceptionHandling.java:19)

-설명 : 입력받는 값이 정수값이어야하지만 문자열을 입력했기에 에러가 난다.

4. 가)

-실행 결과

<terminated> DivideByZeroWithExceptionHandling [Java Application] /Library/Java/JavaVirtualM

```
Please enter an integer numerator: 100
Please enter an integer denominator: hello

Exception: You must enter integers. Please try again.

Please enter an integer numerator: java.util.InputMismatchException
100
Please enter an integer denominator: 7
|
Result: 100 / 7 = 14
```

-설명 :

유효하지 않은 분모값인 0을 입력하였을 때 예외처리를 진행하여 예외 상황임을 알린 후 값을 다시 입력받아 정상적인 값일 경우 결과값이 출력되는 것을 확인 할 수 있다.

4. 나)

-실행 결과

<terminated> DivideByZeroWithExceptionHandling [Java Appli

```
Please enter an integer numerator: 100
Please enter an integer denominator: hello

Exception: java.util.InputMismatchException
You must enter integers. Please try again.

Please enter an integer numerator: 100
Please enter an integer denominator: 7

Result: 100 / 7 = 14
```

-설명 : 정수값을 입력하여야 하는데 문자열을 입력했을 경우 예외처리를 진행하여 예외 상황임을 알린 후 값을 다시 입력 받아 정상적인 값을 입력 받았다면 결과값이 출력되는 것을 확인 할 수 있다.

5.

-설명 : 추가된 구문 밑에서 catch하는 부분에 에러가 발생한다.

이는 트라이 구문에서 예외 발생 시 여러 개의 캐치 구문에서 예외를 잡는 것이 아니라 단 하나의 캐치구문에서 예외를 잡아주는 것인데 상위 예외 클래스가 하위 예외 클래스보다 위쪽에 위치하여 있어서 발생되는 문제이다.

6.

-설명 : 컴파일러는 파일이 존재하는지 아닌지에 대해 모르기에 이에 대하여 에러가 발생하게 된다.

가)
- **코드**

```java
class FileInputTest {
        public static FileInputStream f1(String fileName) throws
FileNotFoundException
        {

                FileInputStream fis = new FileInputStream(fileName);
                System.out.println("f1: File input stream created");
                return fis;
        }
        public static void main(String args[])throws FileNotFoundException
        {
                FileInputStream fis1 = null; String fileName = "foo.bar";
                System.out.println("main: Starting " +
FileInputTest.class.getName() + " with file name = " + fileName);
                fis1 = f1(fileName);
                System.out.println("main: " + FileInputTest.class.getName() +
" ended");
        }
```

−실행결과

<terminated> FileInputTest [Java Application] /Library/Java/JavaVirtualMachines/jdk-14.0.1.jdk/Contents/Home/bin/java (2020. 5. ...
main: Starting w8.FileInputTest with file name = foo.bar
Exception in thread "main" java.io.FileNotFoundException: foo.bar (No such file or directory)
        at java.base/java.io.FileInputStream.open0(Native Method)
        at java.base/java.io.FileInputStream.open(FileInputStream.java:212)
        at java.base/java.io.FileInputStream.<init>(FileInputStream.java:154)
        at java.base/java.io.FileInputStream.<init>(FileInputStream.java:109)
        at w8.FileInputTest.f1(FileInputTest.java:6)
        at w8.FileInputTest.main(FileInputTest.java:15)

나)

–코드

```java
try {
        FileInputStream fis = new
FileInputStream(fileName);
        System.out.println("f1: File input stream
created");
        return fis;
        }
        catch(FileNotFoundException e){
            System.out.println("There is no File");
            return null;
        }
```

–실행결과

```
<terminated> FileInputTest [Java Application] /Library/Java/JavaVirtualMachines/
main: Starting w8.FileInputTest with file name = foo.bar
There is no File
main: w8.FileInputTest ended
```