

Advanced Aspects of Object-Oriented Programming (SS 2009)

Practice Sheet 4

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(until 10 a.m. as PDF via E-Mail)

Exercise 1 *StoJas* Extension (Repetition)

In this exercise, we are going to build extensions to the Java subset *StoJas* that was presented in the lecture.

- Extend the syntax as well as the semantics (static & dynamic) of *StoJas* to support a "`do { ... } while (...)`" statement and give a detailed explanation for the necessary adjustments.
- Extend the syntax as well as the semantics (static & dynamic) of *StoJas* to support interfaces and give a detailed explanation for the necessary adjustments. As for method declarations in classes, you can assume that method declarations in interfaces have exactly one parameter.

Exercise 2 Lecture Concepts

Give an example for the following statement: *Programs with typing errors need not cause type errors.*

Exercise 3 Covariance & Contravariance

- Discuss the concept of Java's *Checked Exceptions* with respect to covariance and contravariance.
- Which kind of guarantee is given by *Checked Exceptions*?

Exercise 4 Exceptions

What does each of the following programs do? Why?

```
import java.io.IOException;

public class Arcane1 {
    public static void main(String[] args) {
        try {
            System.out.println("Hello_world");
        } catch (IOException e) {
            System.out.println("I've_never_seen_println_fail!");
        }
    }
}
```

Arcane1.java

```
public class Arcane2 {
    public static void main(String[] args) {
        try {
            // If you have nothing nice to say, say nothing
        } catch (Exception e) {
            System.out.println("This_can't_happen");
        }
    }
}
```

Arcane2.java

```
interface Type1 {
    void f() throws CloneNotSupportedException;
}

interface Type2 {
    void f() throws InterruptedException;
}

interface Type3 extends Type1, Type2 {
}

public class Arcane3 implements Type3 {
    public void f() {
        System.out.println("Hello world");
    }

    public static void main(String[] args) {
        Type3 t3 = new Arcane3();
        t3.f();
    }
}
```

Arcane3.java