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23.10.2012

Hand in solutions via email to
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until 30.10.2012 (only Java sources and
PDFs accepted) or at the beginning of the
lecture.

Tutorials for “Formal methods for Java” Exercise sheet 1

Exercise 1: Java Semantics

Consider the following Java program:

```
class Test {  
    public static void main(String[] args) {  
        Number[] a = new Byte[3];  
        a[0] = new Integer(1);  
    }  
}
```

What goes wrong? Explain using the Java Language Specification.

Exercise 2: JML Installation

Download and install the “Common JML Tools” from http://sourceforge.net/projects/jmlspecs/files/jmlspecs/5.6_rc4/.

Exercise 3: JML Specifications

Consider the following Java method:

```
static int f(int n){  
    int i = 0;  
    int s = 1;  
  
    while (s < n) {  
        i = i + 1;  
        s = s + 2 * i + 1;  
    }  
  
    return i;  
}
```

Write a JML specification for method `f` that precisely characterizes the method's return value for non-negative input values `n`. Test your specification with the JML runtime checker `jmlrac`. You might need a `main` method that calls `f` with various inputs. Remember: You have to "JML compile" (using `jmlc`) your annotated Java code before you can use `jmlrac`.