



Tutorials for “Formal methods for Java” Exercise sheet 0

Exercise 1: Java Semantics

Consider the following Java program:

```
class A {
    public A() {
        System.err.println(foo());
    }
    public String foo() {
        return "foo";
    }
}

class B extends A {
    private String s;
    public B(String s) {
        this.s = s;
    }
    public String foo() {
        return s;
    }
    public static void main(String[] args) {
        new B("Hello World");
    }
}
```

What is the output of this snippet? Explain using the Java Language Specification.

Exercise 2: JML Specifications

Consider the following Java method:

```
static int f(int a, int b) {
    while (b > 0 && a + 1 != Integer.MIN_VALUE) {
        b = b - 1;
        a = a + 1;
    }
    while (b < 0 && a - 1 != Integer.MAX_VALUE) {
        b = b + 1;
        a = a - 1;
    }
    return a;
}
```

Write a JML specification for method `f` that precisely characterizes the method's return value arbitrary input values `a` and `b`.