
Software Engineering

<http://proglang.informatik.uni-freiburg.de/teaching/swt/2005/>

Exercise Sheet 9

Deadline: June 21st, 2005

Exercise 1 – Design by Contract: (4 points)

Download the Java-Program “Buffer.java” which models a buffer of objects. Give reasonable pre- and postconditions for all methods and the constructor in class Buffer. Are there any class invariants?

Try to write the pre- and postconditions as correct java-expressions, if possible. If it is not possible, try to describe them in a semi-formal way.

Exercise 2 – Hoare-Calculus: (6 points)

Consider the program:

```
s := 0;
a := x;
b := y;
while (a > 0)
  if (a mod 2 == 1) then
    a = a - 1;
    s = s + b;
  else
    b = b * 2;
    a = a / 2;
  end if
end while
```

Prove that the postcondition $\{s == x * y\}$ holds after execution of this program if the precondition is $\{x \geq 0\}$, and that the program terminates.