Universität Koblenz-Landau

FB 4 Informatik

Prof. Dr. Viorica Sofronie-Stokkermans

August, 6 2014

Exercises for "Formal Specification and Verification"
Exercise sheet 10

Exercise 10.1:
Consider the following program:

```
1: if (y > 0) then skip else halt;
2: x := 2*y;
3: z := y;
4: if (x <= z) then goto 6;
5: exit
6: error
```

(1) Describe the formulae for:

- initiation condition $Init$
- Error condition ϕ_{err}
- The single statement transition relations in $\mathcal{R}$
- The program transition relation $\rho_{\mathcal{R}}$

(2) Compute $post^i(Init, \rho_{\mathcal{R}})$ for $i = 1, 2, 3, 4, 5, 6$.
Can you determine a natural number n with $\bigvee_{i=0}^{n} post^i(Init, \rho_{\mathcal{R}}) = \bigvee_{i=0}^{n+1} post^i(Init, \rho_{\mathcal{R}})$?

(3) Use the results in (2) to characterize ϕ_{reach}.

(4) Show that no error state is reachable from the initial state.

You can send me your solution or require clarifications by e-mail before Wed, 6.08.2014 at 17:00.