Christian-Albrechts-Universität zu Kiel
Institut für Informatik und Praktische Mathematik
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Verifikation nebenläufiger Programme

Sommersemester 2004 — **Serie 9** — 21. Juni 2004

Thema: PVS

Ausgabetermin: 21. Juni 2004

Abgabe: 28. Juni 2004 (vor der Vorlesung im Schrein oder in der Vorlesung)

Aufgabe 1 (2 Punkte) Verify the correctness of the second instantiation rule:

$$\frac{\Gamma \vdash \Delta, (\exists x : p)}{\Gamma \vdash \Delta, (\exists x : p), p\{x \leftarrow t\}}$$

Aufgabe 2 (6 Punkte) Specify and prove in PVS that

$$\sum_{i=1}^{n} 2^{n-i} = 2^n - 1.$$

Send your specification file (.pvs) and your automatically generated proof file (.prf) by email to `bls+serie09@informatik.uni-kiel.de` before the deadline.

Aufgabe 3 (5 Punkte) Define the TYPE Graphs (for representing undirected graphs) and the TYPE UnrootedTrees in PVS such that UnrootedTrees is a subtype of Graph. Define the TYPE RootedTrees and discuss if subtyping is possible. Furthermore, define the function that yields a rooted tree obtained by "gluing" two rooted trees at their roots. Which problems arise?