



Algorithmen und Datenstrukturen (Informatik III)

WS1999/2000 – Übungsblatt 8

Abgabetermin: 19. Januar 2000

Aufgabe 1. *virtuelle Prädikate*

Definieren Sie das *virtuelle Prädikat* `is-disj` („ist disjunkt“) und mit dessen Hilfe das Prädikat `is-prdisj` („ist paarweise disjunkt“) sowie einen Datentyp `Partition`.

Spezifizieren Sie formal eine Operation, die aus einer endlichen Anfangsmenge Schritt für Schritt Partitionierungen derselben in $2, 4, 8, \dots$ Teilmengen mit jeweils „annähernd“ gleich großer Mächtigkeit erzeugt, solange bis einelementige Teilmengen entstanden sind („*divide and conquer*“).

Aufgabe 2. *implizite und explizite Funktionen*

Weisen Sie nach, daß die explizite Spezifikation der Funktion

$$1.0 \quad \text{max-int} : \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$$

der Nachbedingung der zunächst implizit spezifizierten Version genügt.

Aufgabe 3. *Date*

Schreiben Sie die Spezifikation von `Date` um, indem Sie zunächst ein Prädikat *ist-Schaltjahr* definieren und dieses dann bei der Spezifikation des „Records“ `Date` benutzen.

Aufgabe 4. *Sortiere*

Spezifizieren Sie implizit eine Funktion

$$2.0 \quad \text{Sortiere} : \text{N-set} \rightarrow \text{N}^*$$

Date: 20 Apr 1994 15:51:25 GMT
From: weberwu@tfh-berlin.de (Prof_Weber-Wulff)
Subject: Computerized Traffic-Light Problems

The Tagespiegel reports today (20 April 1994) on the new, computerized traffic light management system that the city installed at the large traffic circle Ernst-Reuter-Platz. The 1.8 million mark (1.1 million \$) system went on line on Monday, and mastered the first wave of traffic well. After that, the traffic jams swelled to beyond normal proportions.irate drivers complained by telephone and mail, but officials insisted that since it was now computer-controlled, it was okay. Apparently someone threatened legal action, and the city traffic board dispatched people with stopwatches to test the system. Sure enough, it was stuck in the early morning pattern, which was fine for handling inbound traffic, but disastrous in the afternoon rush hour. They have to go back to hand-switching the timing until they figure out what went wrong.

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Date: Wed, 20 Apr 1994 10:57:00 -0400
From: "stanley (s.t.h.) chow" <schow@bnr.ca>
Subject: Risks of winning

I just caught this on TV news last night:

A person won two consecutive keno games in the Montreal Casino. Since this is considered extremely unlikely, the police have been called in to investigate. The two games should have paid \$400K, but the winner has not yet been paid. He is instead doing the talk show circuit with how he analysed the numbers.

Supposedly, in the history of Nevada, the Keno jackpot has only been won once, which made his winning back to back somewhat unlikely. This happened on the electronic keno and has been shut down. The mechanic game is carrying on.

A one line comment by the reporter claimed that "a bug" in the computer repeated the sequence of number exactly every 4,000 games. This may be a case of someone picking a poor random number generator; but may well be the basis for police action. I understood that electronic slot machines are free running, merrily generating random numbers all day long, and pulling the lever merely selects the current number. This seems quite robust.

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Me? Represent other people? Don't make them laugh so hard.