Query Languages with Recursion

May 13, 2018

1 Relational Algebra special characters

selection	$\sigma_{cname<cname2 \wedge enr>10000} E$
projection	$\pi_{cname} E$
aggregate function	${}_{g_1,g_2,...}G_{h_1,h_2,...,h_m}$

Table 1: Unary operators

union	$\cup$
intersection	$\cap$
difference	-
cartesian product	$\times$
division	$\div$
rename	ρ
natural join	$\bowtie$
theta join	$\bowtie_\theta$
left semijoin	$\ltimes$
right semijoin	$\rtimes$
left outer join	$⟕$
right outer join	$⟖$
full outer join	$⟗$
antijoin	?

Table 2: Binaryoperators

Logical AND	$\wedge$
Logical OR	$\vee$
Logical NOT	$\neg$
null	ω

Table 3: Logic symbols and others

$$Grades \leftarrow \pi_{(students.ssn,students.name,grades.grade)}(\sigma_{students.ccn=grades.ccn \wedge grades.assignment=1}(students \times grades))$$

$$Grades \leftarrow \pi_{(students.ssn, students.name, grades.grade)} (\sigma_{(students.ssn, students.name, grades.grade)} (students \times grades))$$

2 Introduction

3 $fixpoint$ Queries

author: Liang
introduction, belong to LFP

3.1 Semantics

describe

3.2 Expressiveness

discuss

3.3 Complexity

P, important theorems and cited proofs

3.4 Problems

discuss

4 CALC-μ

author: Liang
introduction, belong to PFP

4.1 Semantics

describe

4.2 Expressiveness

discuss

4.3 Complexity

PSPACE-complete, important theorems and cited proofs

4.4 Problems

discuss

5 The $while$ Language

5.1 Semantics

5.2 Expressiveness

5.3 Complexity

PSPACE

5.4 Problems