Relational Query Languages: Taxonomy

Relational Query Languages		
Relational Algebra	Relational Calculus	
	Tuple Calculus	Domain Calculus
ISBL, SQL	QUEL, SQL	QBE, MS-Access

When a query language is **relationally complete**

Equivalence of the relational algebra, the tuple calculus, and the domain calculus

Relational Queries and Solutions - Relational Algebra - I

students(**sname**, gpa, fname)
faculty(**fname**, office)

1. all advisors

π_{fname} students

2. all student records with gpa's over 3.0

$\sigma_{gpa > 3.0}$ students

3. all advisors of students with gpa's over 3.0

π_{fname} $\sigma_{gpa > 3.0}$ students

4. offices of all advisors of students with gpa's over 3.0

π_{office} (faculty * $\sigma_{gpa > 3.0}$ students)

Relational Queries and Solutions - Relational Algebra - II

students(**sname**. gpa, fname)
offerings(**cno**, **sem**, fname)
took(**sname**, **cno**, **sem**, grade)

1. students who took a course with their advisor

π_{sname} (students * offerings * took)

2. students who never took a course with their advisor

π_{sname} students - π_{sname} (students * offerings * took)

3. students who took a course their advisor never taught

π_{sname} ($\pi_{sname,\ cno}$ took - $\pi_{sname,\ cno}$ (students * offerings))

3.5) students who took a course with someone other than their advisor

π_{sname}($\pi_{sname,cno,sem}$ took - $\pi_{sname,cno,sem}$(students*offerings))

4. students who only took courses with their advisor

π_{sname} students - π_{sname} ($\pi_{sname,\ cno,\ sem}$ took -

$\pi_{sname,\ cno,\ sem}$ (students * offerings))